THE

TRANSACTIONS

OF THE

PROVINCIAL

MEDICAL AND SURGICAL

ASSOCIATION.

INSTITUTED 1832.

PART I. VOLUME VI.

LONDON:
SHERWOOD, GILBERT, AND PIPER;
AND
DEIGHTON, WORCESTER.

MDCCCXXXVII.

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AT THE

FIFTH ANNIVERSARY MEETING

OF THE

PROVINCIAL

MEDICAL AND SURGICAL ASSOCIATION,

HELD AT CHELTENHAM.

MEETING OF THE COUNCIL OF THE ASSOCIATION AT THE LITERARY AND PHILOSOPHICAL INSTITUTION.

The business commenced on Wednesday, July the 19th, 1837, at one o'clock, when the Members of the Council met at the large room of the Literary and Philosophical Institution, to arrange the business to be transacted at the General Meetings of the members in the evening and on the following day.

The only part of the proceedings which it seems necessary to notice here, was the conversation which took place relative to the town in which the Association should hold its Anniversary in the year 1838. As a compliment to the members in the Eastern counties, who had so handsomely joined the Society, it was thought very desirable by several of those who were present, that some town should be fixed upon in that part of the kingdom.—Cambridge, in this respect, seemed a very appropriate situation, and it was thought might be fixed upon. Dr. Hastings, however, mentioned that he had corres-

ponded with Dr. Haviland, the learned Professor of Medicine in that University, who did not encourage the Society to come there at present. He stated that he was very anxious that the meeting of the Association at Cambridge should be supported as it deserved to be, and trusted that the time would soon arrive when he should feel justified in soliciting its members to meet in that ancient seat of learning.—Leeds also came under discussion as a place of meeting, as some of the members resident there, had, at Manchester, expressed a desire that an Anniversary should be held in that town; but Dr. Hastings read letters from Mr. Hey, Dr. Williamson, and Mr. Teale, from which it appeared that, though very anxious to receive the Association, they thought they might be better prepared in another year than at present to give a suitable reception to the Society.—Liverpool seemed also to offer considerable advantages to the Association, but it was the opinion of Dr. Jeffreys and Mr. Dawson that those advantages would every year increase, and that the members, in that locality, would use their strenuous exertions to receive, with due honour, the members of the Association at any time that the appointment might be fixed there; it was, therefore, on the whole, thought most judicious to defer the time of our visit to this enlightened town.

Finally, after a good deal of discussion, Bath, as a city in every way pre-eminently qualified to give a character to the meeting of the Association, was determined upon; and it was agreed to recommend this appointment to the General Meeting, with Dr. Barlow as President-elect. A good deal of incidental conversation took place relative to a plan, which is much favoured by several influential members of the body, of holding the Septennial Anniversary, in July, 1839, in the metropolis. It was remarked that the members are desirous, in every way, of suppressing all invidious feelings between themselves and their brethren in the metropolis; and it was considered that by holding a meeting in London, and thus coming into immediate communication with each other, the best possible understanding might exist; besides, as several metropolitans

of distinction were members of the Provincial Association, there was, on that ground, a strong inducement to meet in London. Of course no arrangement could be made on this subject, which remains for future discussion.

GENERAL MEETING AT THE LITERARY AND PHILOSOPHICAL INSTITUTION.

At half-past seven in the evening a general assembly of the members and their friends was held at the Literary and Philosophical Institution. The attendance was both numerous and respectable. Amongst the gentlemen present were—W. Addison, Esq., Malvern; Thos. Agg, Esq., Cheltenham; Dr. Allardyce, Cheltenham; J. Annesly, Esq.; Dr. Baird, Liverpool; Dr. J. L. Bardsley, Manchester; Dr. Barlow, Bath; R. Barnett, Esq., Stourport; Dr. Baron, Cheltenham; Mr. Beddoes; Dr. Bernard, Cheltenham; Dr. Black, Bolton; Thomas Blackall, Esq., Exeter; William Blenkinsop, Esq., Warwick; Dr. Boisragon, Cheltenham; Dr. T. Boisragon, Cheltenham; Dr. Bompass, Fishponds, Bristol; C. J. Brickwell, Esq., Banbury; R. Broadbent, Esq., Altrincham; Mr. Brown, Cheltenham; Samuel Bryant, Esq., Bristol; Mr. Burkitt, Cheltenham; G. Bury, Esq., Farnham; Dr. Cannon, Cheltenham; Henry Carden, Esq., Gloucester; R. Ceely, Esq., Aylesbury; John Chapman, Esq., Leamington; J. D. Charles, Esq., Stow; Dr. Chaytor, Manchester; F. T. Child, Esq., Bath; Mr. Child, Wotton Underedge; H. Coles, Esq., Cheltenham; Dr. Coley, Cheltenham; Dr. J. Conolly, Warwick; Dr. Conolly, Cheltenham; C. T. Cooke, Esq., Cheltenham; Jos. Cooke, Esq., Tenbury; C. Cooke, Esq., Ledbury; Dr. Beale Cooper, Evesham; Mr. Copeland, Cheltenham; J. Correy, Esq., Finsbury; W. B. Costello, Esq., London; W. C. Cota, Esq., Cheltenham; Dr. C. Cowan, Reading; Jas. Crang, Esq., Timsbury; J. G. Crosse, Esq., Norwich; W. Dalton, Esq., Winchcomb; J. Darke, Esq., Berkeley; Dr. Davis, Presteign; F. Davies, Esq., Pershore; F. Davies, Esq., Wells; T. Davis, Esq., Upton-upon-Severn;

E. E. Day, Esq., Bristol; Dr. P. T. Dick, Clifton; Dr. Dudley, Stourbridge; J. Dudley, Esq., Stourbridge; W. Dunlop, Esq., Bury; T. W. Earle, Esq., Cheltenham; C. Edkins, Esq., Campden; J. J. Evans, Esq., Bristol; A. Eves, Esq., Cheltenham; Mr. Falton, Cheltenham; W. Farr, Esq., London; Dr. J. J. Feild, Worcester; G. Fletcher, Esq., Croydon; W. Fletcher, Esq, Cavendishbridge; Dr. Forbes, Chichester; Mr. Fortman, Cheltenham; C. Fowler, Esq., Cheltenham; Dr. Fox, Bristol; Dr. Furniss, Cheltenham; Dr. Gibney, Cheltenham; R. Goullett, Esq., Cheltenham; J. Greening, Esq., Worcester; Dr. M. Hall, London; S. Hare, Esq., Leeds; J. G. Harrison, Esq., Manchester; Dr. C. Hastings, Worcester; Dr. Hennen, Southampton; W. Hetling, Esq., Bristol; Dr. Heywood, Blandford; J. Hodgson, Esq., Birmingham; Dr. Holbrooke, Monmouth; Dr. Holme, Manchester; C. Hooper, Esq., Kempsey; Mr. Jearret, Cheltenham; Dr. Jas. Johnstone, Birmingham; W. Jones, Esq., Henley-in-Arden; W. Jones, Esq., Worcester; Jos. Jordan, Esq., Manchester; Dr. Wm. Kay, Clifton; Mr. Ketting, Clifton; J. Kilvert, Esq., Bath; J. G. Lansdown, Esq., Bristol; P. Leman, Esq., Sodbury; Dr. Bleeck Lye, Hereford; Dr. Lyon, Manchester; Dr. Macartney, Dublin; Dr. Malden, Worcester; Peter Martin, Esq., Reigate; Geo. May, Esq., Reading; Dr. Mc Cabe, Cheltenham; W. Nash, Esq., Cheltenham; Geo. Norman, Esq., Bath; Dr. Outhwaite, Bradford, Yorkshire; J. Perrins, Esq., Cheltenham; H. Perry, Esq., Henbury, Bristol; H. Phœné, Esq., Ryde, Isle of Wight; J. Pilkington, Esq., Cheltenham; T. Poole, Esq., Cambridge; Dr. Ring, Reading; Dr. Rumsey, Amersham; H. W. Rumsey, Esq., Chesham; Dr. Shapter, Exeter; Dr. G. Shattuck, Boston, U.S.A.; Wm. Sheldon, Esq., Cheltenham; J. P. Sheppard, Esq., Worcester; Mr. Sherwood, Suffolk; Dr. Shute, Gloucester; H. L. Smith, Esq., Southam; Samuel Smith, Esq., Winchcombe; Thos. Smith, Esq., Stroud; J. S. Soden, Esq., Bath; G. Soulby, Esq., Ash, Kent; J. C. Spender, Esq., Bath; Dr. R. I. N. Streeten, Worcester; F. L. Surrage, Esq., Clifton; Dr.

Symonds, Bristol; J. Tanner, Esq., Ledbury; W. Taunton, Esq., Worcester; Dr. R. C. Thomas, London; Dr. C. W. Thomas, Cheltenham; P. Thompson, Esq., Cheltenham; Dr. Thomson, Stratford-on-Avon; Sir C. Throckmorton, Bart., M.D., Coughton Court; J. G. Toogood, Esq., Bridgewater; B. Toogood, Esq., Bridgewater; W. Tudor, Esq., Bath; J. Webb, Esq., Alcester; Dr. Webster, Dulwich; J. Whitmore, Esq., Cheltenham; O. W. Williams, Esq., Leamington; John Williams, Esq., Bewdley; J. W. Wilton, Esq., Gloucester; M. Wise, Esq., Banbury; Mr. Wood, Gloucester; M. A. Wood, Esq., Ledbury; John Woodcock, Esq., Bury; J. Woodward, Esq., Worcester; W. Woodward, Esq., Pershore; T. Workman, Esq., Basingstoke.

Dr. Baron moved that Dr. Holme, of Manchester, do take the chair, which motion having been seconded and complied with—

Dr. Holme said he had had the honour of being appointed President last year, for which honour he begged to tender to the Association his most grateful thanks; it had been to him a situation rather of pleasure than of labour; the unalloyed delight he had experienced in attending those meetings had left traces of gratification which could never be effaced. He felt that he was inadequate to the task of addressing an assembly so numerous and so respectable, comprising, as it did, all the *élite* of the profession in the provinces, and among them were many professors whose talents could not be surpassed in Great Britain, or any country in the world. He felt happy to resign his honourable situation to one who had much more ability to fill it, and whose rank and standing in the profession were of so eminent a degree. He would not enlarge on the subject of the Report, which would be read by their admirable Secretary, neither would he insist on the well-known talents and merits of that gentleman, on whose exertions the prosperity of the Association mainly depended. The learned Doctor concluded by resigning the presidency to Dr. Boisragon, who then addressed the assembly to the following effect:—

ADDRESS OF THE PRESIDENT.

It is not, gentlemen, more my inclination than my duty, on this gratifying occasion, to bring before you some of the principal subjects of attention to which this, the selected place of your present meeting, may justly lay claim, and which may not only contribute to the science of rational *Hygiene*, but may also serve to disabuse the public mind on some points respecting the actual physical constitution of the Cheltenham springs. It is almost unnecessary to assure the meeting, that it will not only afford the greatest satisfaction to the liberal proprietors of all the springs to receive such members of the Association as feel an interest in the inspection or examination of the different wells and baths, with every attention, but I am authorised to say, they court the inquiry of every scientific chemist in your body. To facilitate your wishes, a few gentlemen, most conversant with similar investigations, will have the pleasure of accompanying you, prepared with such tests and reagents as you all know are capable of detecting the various constituents on which the efficacy of the waters over various classes of functional or organic disease depends.

I may in this place briefly state, that an important and novel agent has, within the last two or three years, been discovered as existing in one of the wells, recently, and at a considerable expense, opened in the Montpellier property. The chemical constitution of this water was first examined by Mr. Cooper, whose practical skill in the difficult and delicate manipulations, requisite for arriving at any degree of accuracy in this species of complicated analysis, is probably known to you all. In this water he detected a decided trace of iodine; and Dr. Daubeny, professor of chemistry, at Oxford, (whose absence I much regret on this day,) has more lately pronounced this substance to exist in the waters, and in a very appreciable quantity.

No inconsiderable addition to the therapeutic advantages of Cheltenham has been recently presented to the public, by Mr.

Baynham Jones, in the extension and improvement of the well-known chalybeate spring, for many years existing under less valuable and attractive qualities in Cambray. This spring is of undoubted efficacy in dyspeptic affections, and other disorders of loss of energy in the muscular fibre; and from its efficacy as a corroborant of the system, has frequently superseded the necessity of a journey to Tunbridge, or the still more celebrated springs of Spa and Pyrmont. A useful saline aperient has also been added to the stock of active waters permeating the lias formations at this spot.

I have also much pleasure in observing that an Essay on the Nature and Medical Application of Iodurettted Waters, with a notice of that of Cheltenham, has been presented to the public by a young and very ingenious medical practitioner of this place, Mr. Nash. It is true, gentlemen, we cannot yet boast of such public institutions for the study of acute disease as might entitle us to bring under your notice the inductive results of clinical observation; our Hospital and General Infirmary, at present in its infancy, and only grafted on a Dispensary of an extensive range and character, affords but little save the germ and indication of its future prosperity. But in the same proportion as we are by circumstances and locality hitherto deficient in the *clinique* of public instruction, are we bountifully supplied with means of private and accurate investigation, Cheltenham having constituted the focus for above sixty years, of a greater variety of chronic diseases, both of an European and intertropic origin, and abounding in more cases of alterations of structure and organic lesions, as well as in rare and interesting modifications of functional derangement, than can perhaps be exhibited by any one provincial town in the empire.

It is therefore my hope that, at no distant period, the medical investigation of Cheltenham practitioners may find a permanent station among the valuable *Transactions* of your Association.

Yet, gentlemen, to carry into effect an object so important to medical science, and consequently to the increased security

and future treatment of millions yet unborn, demands a greater interest, a more willing assent among the middle and upper ranks of society than have hitherto been evinced, even by those whose personal and relative interests for the many who are to follow them, or for those whose precarious existence still agitates their hearts, might fairly be expected; and who, in denying *post-mortem* examination in doubtful or intricate cases of disease, appear to stand still, if not to retrograde in the march of rational improvement. It is, I humbly conceive, therefore, not an unimportant duty of such a body as yours, to recommend, by individual example and persuasion, that beneficial instructor of the science you profess: to hold up *post-mortem* examination as a social duty; and to endeavour to lead the public mind to associate the act with much that is valuable to the living, and even respectful to the dead; by referring to the practice, as applied to the highest and noblest of our species, including royalty itself, and thus gradually endeavouring to overcome the prevailing opposition, by influential example, and by connecting it with the moral obligations of an advancing condition of society.

There is, however, gentlemen, one, and that, for the comfort and safety of its inhabitants, no trifling consolation, attending our hitherto deficient establishment for public clinical observations; I mean the positive and indisputable healthiness of our soil and climate, which experience proves to be in a remarkable degree hostile to the invasion of epidemic disease under all its modifications of character; and when existing partially under the forms of catarrhal fever, influenza, or the numerous species and varieties of the acute exanthemata, which disappear with greater facility of treatment, and terminate more favourably, as to the relation of fatal cases to the number affected, than in any place of similar population in the kingdom.

Fever, the giant scourge of most, if not all great towns, the mighty depopulator of cities, is here nearly unknown; and if idiopathically occurring from rare and peculiar combinations of united poverty and exposure, or with the curse of alcohol to hasten the susceptibility, it is merely the exception that

proves the rule ; as I think I can positively assert, that from the combined advantages we possess, of a free and unvitiated atmosphere, the absence of all *culs-de-sac*, where a dense and filthy population generates a never-ceasing fomes of contagion, and from the cleaner habits of even our humblest inhabitants, typhus gravior, or even petechial or remittent fevers, are almost as great curiosities to the profession, as in less favoured situations they afford abundant sources of daily observation.

That this happy immunity, narrowing to a certain degree our public *clinique*, arises from the site and geological arrangements of the strata and the saline properties of our subsoil, is matter of scientific demonstration, as it is notorious that while the late awful visitation of the Asiatic cholera was destructively raging, as it did, along the banks of the Severn, from Bristol to Worcester, yet Cheltenham, although distant only, as the crow flies, seven miles from our neighbour Gloucester, and with an uninterrupted intercourse of all classes between the towns, did not, during the whole period of its duration, present one single or even doubtful case of that frightful though partial epidemic within a radius of several miles from the spot on which we are now assembled.

These interesting facts in medical statistics are not less important than the proofs they advance of the miasmatic origin and non-contagious character of this subtle puzzling disease—although its pathognomonic symptom, being purely a separation of the serous portion of the blood, withdrawn from the system by the morbidly increased action of the exhalant vessels into the intestinal canal, and produced by the introduction or absorption, probably of a peculiar miasma, under circumstances of individual susceptibility, presents, in my humble opinion, not only the most probable cause of its production or prevention, but the best indications of cure on its attack.

As the results of all the most important recent medical discoveries and improvements will be treated of in the Retrospective Address of Dr. Bardsley, any observations of mine on these subjects would be out of place ; yet I cannot, on this occasion, deny myself the satisfaction, however briefly ex-

pressed, of glancing at the monstrous, and as I humbly presume to name it, unphilosophical hypothesis in which a modern German school pretends to envelope, by a system of what it is not too harsh to denominate mystical delusion, the simplest truths and incontrovertible facts of physical agency. If the doctrines of Hahnemann were founded on any true principle or law of accurate pathology; if it were true in fact, as in assertion, that by one invaluable axiom on which as the foundation or corner-stone, the alpha and omega of homœopathic pretension, all correct pathological and therapeutic science must rest; then should its laws and agencies apply with equal force to acute and violent, as they assert they do, on the safe field they attempt to occupy, to chronic affections of the nervous system. The felicitous logic, the subtle refinement of their assumed and untenable dogma the "*Similia curantur simillimis*,"—which must exist and act as a general and all prevailing truth, or die the death, like the false prophets and dreaming martyrs of Mesmer and Cagliostro—ought and must operate as certainly in apoplexy or pneumonia as the apostles of their ludicrous creed pretend it does in that class of diseases, from simple hysteria to chorea or epilepsy, through all the proteiform modifications of dyspeptic irritability, in which, as we all know, gentlemen, imagination is sometimes more potent than the drug.

In delivering the few observations now ventured upon, I beg to be considered as by no means impugning the good faith or conscientious conviction of the advocates of these doctrines, but as arraigning a system of medical pretension, arrogating to itself no ordinary degree of merit and novelty.

It may be thought, gentlemen, by some who hear me, that any consideration or reference to these opinions is altogether uncalled for, and merely a waste of time that might be better occupied by higher and fitter inquiries. I trust I may be pardoned in differing from such, if any such there are, since it is but too true that homœopathic doctrines and homœopathic practice have prevailed to a considerable extent.

Gentlemen, proselytism to the doctrines of speculative

opinions in pathology is no test of truth; every system, however vague in assertion and futile in practice, has its proselytes, as any creed, from the deformed and bloody idol of Juggernaut to the less revolting dogmas of the Crescent, has its martyrs; and as it is but too truly demonstrated by the records of all history, that every opinion flourishes by persecution, it is better becoming the dignity of science and the tolerant liberality of our happy age and country, to examine without opposing, save through the calm and cautious medium of common sense applied to philosophical inquiry, the high-sounding claims and self-superior intelligence of the disciples of Hahnemann.

I shall employ but a few more moments of your time, in referring to the therapeutic system of this school, in which the doctrine of infinitesimals, or of infinitly small doses of any medicinal agent, might confound the mathematical acuteness of a Euler or Laplace. Indeed, gentlemen, this part of the subject is more deserving of the caustic pen of a Swift or a Cervantes than the sober dignity of a grave and learned meeting. It is a maxim of the jurists that "*de minimis non curat lex*," but with the Æsculapian inspiration of "*Messrs. les Homœopathistes*," the converse is the golden rule of potent and all-commanding power; and forsooth the ten millionth of a drop or grain possesses a power and energy so perfectly in the inverse ratio of its quantity, that many of their choicest cases of diseases require the doses to be *increased* a thousand fold, lest the enormous and frightful energy of the infinitely *minute* dose should overcome the patient instead of the disease, and produce death to the victim or the doctrine by the overwhelming smallness of the remedy.

And now, gentlemen, having, as I fear, trespassed already too long on your patience and attention, I hasten to that termination which a due sense of the more important business soliciting your attention reminds me is at hand; yet I cannot conclude without painfully conveying to you some brief expression of mournful regret (which will, I doubt not, be more largely and eloquently recorded in the Retrospective Address) of the bereavement the Association has recently experienced

in the decease of two of its most valued members, both my predecessors in this chair. Distinguished each as eminent and learned physicians, full of years and honours, they have descended to the resting place of all living, leaving behind them lasting memorials of that simplicity and probity of character that give to eminence its brightest lustre, to celebrity its most enduring reward.

Can I then, gentlemen, better release you from the half hour's attention with which you have honoured me, than by quoting from the simple and elegant Latinity of the first medical classic of any age or country, combining, in himself, the noble, the scholar, and the physician, when speaking of the cultivation of elegant letters as essential to the medical character, and which, with melancholy pleasure, we may refer to our deceased and respected Presidents,—"*Ergo etiam post eos, de quibus retuli, nulli clariores viri medicinam exercuerunt; donec majori studio literarum disciplina agitari cœpit, quæ ut animo præcipue omnium necessaria, sic corpori inimica est. Primoque medendi scientia sapientiæ pars habebatur; ut et morborum curatio, et rerum naturæ contemplatio, sub iisdem auctoribus nata sit.*"

After the language of Celsus, gentlemen, and such a eulogium to our art from such a man, another word would be presumption.

Dr. Hastings, the Secretary, being called on from the chair, read the Report of the Council, as follows:—

THE REPORT OF THE COUNCIL OF THE PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION, FOR THE YEAR, 1837.

If the annual statement made by the Council of the Association has, on former years, been regarded with deep interest by the members at large, it is certain that on the present occasion there will be no diminution of desire to know the progress that has been made in the prosecution of our great designs since the Anniversary Meeting at Manchester. For since

that meeting grave considerations have engaged the attention of the Council—considerations which involve questions of vital importance to the future prosperity of our flourishing Institution.

The most important announcement we have to make, is one which will at once convince those, if any such there are, who doubt the onward course of prosperity of the Association, that the advancement made during the past year in public estimation, far exceeds that of any former period of a similar extent; for the number of members, during the year, has increased from six hundred to nine hundred and forty; whereas, in former years, the increase has never exceeded one hundred and seventy members.

DISTRICT BRANCHES.

This great increase in the number of members is very much to be attributed to a modification of the existing constitution of the Association, which the Council have considered it desirable to adopt during the past year, and which they trust will receive the sanction of the members at this Anniversary, and become, in future, part of the laws of the Society.

It will be in the recollection of many of the members now present, that at the Manchester Meeting a Committee was appointed to confer with a Deputation from the Eastern Provincial Medical Association, respecting the junction proposed to be formed between the two Societies. The Committee, unwilling to come to a determination adverse to the Eastern Association, thought it right that the members at large should have the opportunity of forming a deliberate judgment on the subject, and, therefore, recommended that the consideration should be postponed, with a view to arrangements being devised which might be satisfactory to all parties.

Your Council have to report that, much to the honour of those who managed the negociation for the Eastern Association, no long time elapsed after the meeting at Manchester, before a communication was received by the Council, from the

Secretary of the Eastern Association, stating, most explicitly, the desire of that body to dissolve themselves as a separate Association, and to become members of the Provincial Association; still, however, reserving to themselves the right to hold meetings in the Eastern counties, and to consider themselves a District Branch of the Association. This proposition, so very creditable to the high feelings and sober judgment of the members of the Eastern Association, the Council did not hesitate to comply with, and it only then remained to devise the means by which this District Branch might be carried on.

Subsequently to the junction of the Eastern Branch, District Sections have been constituted upon similar principles, at Wells, at Bath, and at Southampton, the latter embracing within its limits the Southern counties generally.

When the Association was instituted, the constitution given to it was adapted to its probable wants and extent, and great care was taken not to overload it with rules and regulations beyond what might be required; simplicity and efficiency were sought to be combined, and the experience of the last five years may be adduced to show that the early projectors did not fail in their design. With a rapidity, however, unexampled in the annals of the profession, and almost in the annals of social institutions, has the Association increased, so as to spread over the kingdom to an extent which the most sanguine of its earlier friends could never have anticipated.

From such increase, and from the wide extent of district now embraced, certain wants have arisen which require to be systematically supplied. In this respect the Council have preferred waiting until the wants should manifest themselves, rather than by an anticipation, which might prove hasty and unfounded, hurry into legislative provisions for which the necessity might never arise. The necessity has manifested itself unequivocally, as your Council have already shown. The Council have hitherto met it in the way which their best judgment directed, and guided by past experience, they now render to the members in general an account of what they have done, and submit to their consideration the further mea-

sures which will be this day proposed for their sanction. The following regulations are those which they would recommend as fitted for the general construction of the District Branches.

PROPOSED REGULATIONS.

1.—That in order to fulfil more effectually the several purposes for which the Provincial Association was formed, it is expedient that a still more intimate union of its members be promoted, by the establishment of District Branches.

2.—That members of the Association be at liberty to form District Branches wherever it may suit their convenience.

3.—That in order to facilitate the formation of such branches, and maintain uniformity amongst them, the General Council provide suitable instructions for the guidance of those who may unite in instituting them.

4.—That conformity with these instructions be further ensured, by the initiating proceedings, and organization of each branch, being submitted to the General Council, for their revision and approval.

5.—That the District Branches be free to govern themselves as their respective members may think fit; but that the by-laws ordaining the special government, be submitted to the General Council previously to their taking effect, in order to guard against the possibility of any such by-laws contravening the fundamental laws of the Association.

6.—That all members appointed to offices by the District Branches, be forthwith enrolled as members of the General Council, on the appointments being officially notified to the General Council, it being highly expedient that all who engage in the executive management of the District Branches, should be also members of the General Council.

7.—That the expenses incurred by the District Secretaries in conducting the proceedings of the District Branches be defrayed from the general fund, provided such expenses

do not in any instance exceed one-seventh part of the guinea subscribed by each member enrolled in the District Branch.

8.—That if any circumstances arise in the formation of District Branches, which call for a larger expenditure than what is allowed by the foregoing resolution, such expenses, provided they do not exceed one-fourth of the guinea, may be allowed by a statement of the circumstances being made known to the General Council.

FINANCES.

The Council have much gratification in reporting that the funds of the Association are in a prosperous state.

	L.	S.	D.
The Receipts are	1010	8	11
The Expenditure is	698	6	10
Balance in hand	£312	2	1

The expenditure has been larger this year than formerly, from several causes. Firstly, from its having become necessary to publish a second edition of the first volume of *Transactions*; secondly, from the increase in the number of members rendering it desirable that a large impression of Volume Five should be published; and thirdly, from the Council having consented to the request made by the Poor Law Committee, to publish a second edition of the Poor Law Report, together with an Appendix, containing valuable information respecting the operation of the new system of parochial medical relief.

TRANSACTIONS.

The contributions of the members have enabled the Council to publish a fifth volume of *Transactions*, which will bear a comparison with the preceding volumes, and contains information on almost all the subjects proposed for investigation by the Association. There is one subject, however, to which the

Council deem it right to direct the attention of the members; it is the paucity of Hospital Reports. It is matter of surprise, considering the interest which now attaches to one very important branch of medical inquiry, vital statistics, that so little should be done upon this subject by provincial practitioners. Hospitals and Infirmaries, by congregating together a considerable number of sick persons, in this kingdom, afford ample means for forwarding our knowledge on this important subject; and it is much to be hoped that the members of this Association, who are connected with Sanitary Institutions, will use their utmost endeavours to promote these inquiries. In the *British Medical Almanac* they will find detailed accounts which may greatly assist them in carrying on these pursuits.

The Council reflect with much pleasure on the increasing circulation of their *Transactions*. The impression, which at first was five hundred, has now reached twelve hundred. A second edition of Volume One has been published, and a second edition of Volume Four is now called for; and it will probably be necessary, at no distant day, to answer that call.

PAROCHIAL MEDICAL RELIEF.

During the year of which your Council are now taking a retrospect, the labours of the Poor Law Committee, from which so excellent a Report emanated at Manchester, have been continued. The Committee sent a printed Appendix to that Report to every member of the Council; they afterwards revised the Appendix, added to it, and published it together with a second edition of the Manchester Report, and it is now on sale, and ought to be in the hands of every member of the profession, as it is now appealed to as an authority upon this subject, and has been very favourably reviewed by every Medical Journal that has noticed it. Acting on the suggestion of the same Committee, your Council thought it right to address a circular letter to every town in the kingdom, recommending petitions to be sent to Parliament, praying for an alteration in the system of parochial medical relief. The mode

in which that appeal has been answered, is testified by the numerous petitions which have been laid on the tables of both the Houses of Parliament—petitions which at any rate will have the effect of convincing the Legislature that the medical profession, as a body in the community, have political rights, and that the dictates of humanity for the sick poor, and the calls of justice to medical men, require that some alterations should be made in the mode of parochial medical relief.

BENEVOLENT COMMITTEE.

The members of the Association will be glad to learn that the Benevolent Fund, the rules and regulations for the management of which were finally adopted at the Anniversary Meeting of last year held at Manchester, is already in operation, and is believed to have been the means of rendering very essential aid in two instances of undeserved misfortune befalling highly respectable members of the profession. The state of the finances, with other matters concerning the Benevolent Branch of the Association, will be stated in a short Report that will be presented from the Central Committee.

REGISTRATION OF DISEASES.

Your Council think it right to advert to the new Act for the Registration of Diseases. It will be recollected that at the Bristol Meeting this Association sent a petition to the Legislature on this subject, and now that a measure has been adopted to remedy the evil, your Council feel assured that every member will feel called upon to do his utmost towards rendering it effectual. As intimately connected with medico-statistical inquiries, to which a correct registration of diseases is of such paramount importance, the Council beg to recommend that the members of the Association, individually, should endeavour to produce, quarterly or annually, a Meteorological Report, in order that a regular periodical contribution of the same, from various districts to the Association, may be arranged and prepared for publication in the *Transactions*.

PRIZE ESSAY.

No further contributions have been received for the Prize Essay Fund, but the Council have to announce that Dr. Thackeray has increased his already liberal donation to fifty pounds, to be given as a prize for the best Essay on a Medical Subject, to be fixed upon at the Anniversary Meeting at Cheltenham. The prize, which the Council propose shall be called the Thackeray Prize, to be open to the competition of the members of every accredited school for medicine and surgery in the United Kingdom, and the Essays to be sent to the Secretaries one month previous to the Anniversary Meeting in 1838.

On the advancing progress, and on the brilliant career of this vigorous and energetic Association, it is scarcely necessary for your Council to dwell. Already has it, in a few short years, established for itself a name and a character which other similar Societies have been long in acquiring. Our anticipations for the future are encouraging and ardent. They lead us to expect that pursuing with zeal, steadiness, and judgment, the course of investigation which they have so auspiciously begun, the members of this Association will have the bright and pleasing reward of having aided, by their exertions, in extending the empire of human knowledge, and of diminishing the amount of suffering and misery.

Dr. Beale Cooper, of Evesham, in moving the first resolution, regretted that the task had not fallen into abler hands; he was almost a stranger among them, as his numerous avocations almost precluded the possibility of his practising; still he did not entirely lose sight of science,—the love of science dwelt deeply in his breast. He was proud to be a member of that profession which did so much for the cause of humanity, and did so much gratuitiously. He concluded by moving—

That the Report of the Council now read be approved and adopted by this meeting.

This was seconded by Mr. Hare, of Leeds, and carried unanimously.

Dr. Holme, of Manchester, then moved—

That in accordance with the recommendation of the Council the following be the regulations under which District Branches of the members of this Association may be formed.

REGULATIONS OF THE DISTRICT BRANCHES.

1.—That in order to fulfil more effectually the several purposes for which the Provincial Association was formed, it is expedient that a still more intimate union of its members be promoted, by the establishment of District Branches.

2.—That members of the Association be at liberty to form District Branches wherever it may suit their convenience.

3.—That in order to facilitate the formation of such branches, and maintain uniformity amongst them, the General Council provide suitable instructions for the guidance of those who may unite in instituting them.

4.—That conformity with these instructions be further ensured, by the initiating proceedings and organization of each branch being submitted to the General Council, for their revision and approval.

5.—That the District Branches be free to govern themselves as their respective members may think fit; but that the by-laws ordaining the special government, be submitted to the General Council previously to their taking effect, in order to guard against the possibility of any such by-laws contravening the fundamental laws of the Association.

6.—That all members appointed to offices by the District Branches, be forthwith enrolled as members of the General Council, on the appointments being officially notified to the General Council, it being highly expedient that all who engage in the executive management of the District Branches, should be also members of the General Council.

7.—That the expenses incurred by the District Secretaries in conducting the proceedings of the District Branches be defrayed from the general fund, provided such expenses do not in any instance exceed one-seventh part of the guinea subscribed by each member enrolled in the District Branch.

8.—That if any circumstances arise in the formation of District Branches, which call for a larger expenditure than what is allowed by the foregoing resolution, such expenses, provided they do not exceed one fourth of the guinea, may be allowed, by a statement of the circumstances being made known to the General Council.

Seconded by Mr. Soden, of Bath, and carried unanimously.

Dr. Baron, of Cheltenham, said that a resolution had been entrusted to him, which caused him to rise under feelings of considerable embarrassment, as he had to move a vote of thanks to an individual then present. When he mentioned the name of Dr. Holme, his exalted professional character, his many and great mental endowments, and the admirable manner in which he had conducted the affairs of the Association during the year it had been under his presidency, he was sure they would all feel with him, that it was a peculiar honour to be selected to move the thanks of the Association to such a man; he therefore had great pleasure in proposing—

That the thanks of this meeting be given to Dr. Holme, the late President, and that he be appointed a permanent Vice-President.

This being seconded by Mr. Tudor, of Bath, and put from the chair, was carried by acclamation.

When the cheering had subsided, Dr. Holme said—"Gentlemen, I trust you will give me credit for more feeling than I can find words to express; I do not wish to use a common or hacknied phrase, but I really am overpowered by sentiments and feelings to which I am at a loss to give utterance. This Association I can only forget when life forsakes me; my connection with it has been one of unmitigated

delight—delight enhanced by the personal friendship and kindness of many of its members."

Dr. John Conolly, of Warwick, said that he had been entrusted, much to his gratification, with a resolution, of which the object was to express to their much valued Secretaries the grateful sense entertained of their services by the members of the Association. He could not, he said, propose this resolution without expressing the extreme satisfaction which it gave him, once more to meet the members of the Association, and to see an attendance as large, and as respectable as on any former occasion, and presided over, as on former occasions, by those eminent for accomplishment and knowledge. It gave him the more pleasure to see the number then met together, and to know, as he did, that at that moment members of the medical profession were approaching Cheltenham from every quarter of the kingdom; because, living in the country, and deriving much of his information concerning professional events from the medical periodical press, he had read with much concern, that their Association was declining in numbers, and degenerating in spirit; that it was dwindling away into insignificance and uselessness, or worse than uselessness; becoming, in fact, an instrument of oppression, to be applied to the medical body in general. Much to his surprise, he had read that their greatly venerated Presidents of former years, Johnstone, and Carrick, and Kidd, and Holme—much honoured names—were in a confederacy with their good friend, Dr. Hastings, and other members of the Association, to oppress and trample on the general practitioners. It gave him great delight, therefore, to find, by the Report of the Council, that in real truth, the members of the Association had become more numerous by one-third since they last met, and that they still kept in view every object worthy of a liberal and scientific Institution. As it would very ill become them in this, their prosperous estate, to notice with any feeling except that of perfect good humour, the mistakes of any part of the periodical press, and as it would particularly ill become him to speak, with any thing

approaching to irritation, of the mistakes to which the contributors of the press were liable, he would, therefore, only say that he regarded the doleful prophecies of which the Association had been the subject, as arising out of the difficulty under which London editors might labour in obtaining correct information concerning provincial proceedings. With respect to the general views of the Association, it was wholly unnecessary for him to speak in defence of them. He might say of all the idle reports circulated to its prejudice, that it was

> "so armed in truth and honesty,
> That they passed by it like the idle wind,
> Which it regarded not."

Independently of the many valuable services which he believed the Association would be found to perform for the profession, there was not, he felt assured, one member who had been in the habit of attending their Annual Meetings who had not derived pleasure from the Association; who had not returned to his own house happier for having met so many friends, for having seen so many of those who were worthy of respect and of their great fame, and become, as it were, more strongly tied to the profession by the scientific interest and friendly feelings there excited; hoping, always, to meet the same valued and esteemed friends again and again. They could never forget that for these pleasures, and for every advantage of the Association, they were deeply indebted to their Secretaries, and especially to the judgment and indefatigable zeal and industry of Dr. Hastings. It therefore gave him particular pleasure to find that the members of the Association had resolved to mark their sense of his services by presenting to his family a lasting memorial of him in the shape of a portrait; which, although he called it a lasting memorial, would be far less lasting than the pure and honourable fame which Dr. Hastings would bequeath to their perpetual remembrance. Nothing remained for him to do but to propose the resolution, which he felt assured would be warmly supported by all who heard him. He would move—

That the thanks of the meeting be given to Dr. Hastings and Mr. Sheppard, the Secretaries, and that they be requested to continue their services.

This being seconded by Dr. Lomax Bardsley, of Manchester, was carried by acclamation.

On the motion of Mr. Barnett, of Stourport, seconded by Dr. Coley, of Cheltenham—

That the thanks of this meeting be given to the Council for the past year, and that they be requested to continue their services, with the following additional members:—James Fryer, Esq., Bewdley; Kenrick Watson, Esq., Stourport; Richard Williams, M.D., Aberystwith; Dr. Ring, Reading; Dr. Kendrick, Warrington; George Fletcher, Esq., Croydon; Robert Ceeley, Esq., Aylesbury; H. W. Rumsey, Esq., Chesham; S. Macmullen, M.D., Wells; Simeon Bullen, Esq., Wells; Charles Fowler, Esq., Cheltenham; Æneas Cannon, M.D., Cheltenham; Joseph Atkinson Ransome, Esq., Manchester; Thomas Fawdington, Esq., Manchester; Richard Broadbent, Esq., Altrincham; W. H. Durham, Esq., Wickham Market, Suffolk; James Black, M.D., Bolton; William Goodlad, Esq., Bury; John Moore, Esq., Bolton; Abraham Wood, Esq., Rochdale; William Blenkinsop, Esq., Warwick; H. L. Smith, Esq., Southam; James Watson, M.D., Bath; Race Godfrey, Esq., Bath; J. Baruch Toogood, Esq., Bridgewater; T. P. Teale, Esq., Leeds; Thomas Agg, Esq., Cheltenham; Charles Turner Cooke, Esq., Cheltenham; H. Shute, M.D., Gloucester; George Hitchings, Esq., Oxford; Dr. Morgan, Bath.

Mr. Costello, of London, next moved, and Dr. Lyon, of Manchester, seconded—

That the thanks of the meeting be given to Dr. James Clark and Mr. Hebb, for the trouble they have taken in communicating with our foreign members, and that Dr. Clark be requested to offer the same to Dr. Lombard, of Geneva, for his Statistical Report of the Hospital of Geneva.

It was then moved by Dr. Black, of Bolton, seconded by Mr. Addison, of Malvern—

That the Anniversary Meeting for the year 1838 take place at Bath, and that Dr. Barlow be appointed President-elect.

Dr. Barlow, of Bath, briefly expressed the gratification he felt, and which he was assured would be participated by his professional brethren in Bath.

Dr. Barlow then moved, seconded by Mr. Smith, of Southam—

That Dr. Malden, of Worcester, be requested to deliver the Retrospective Address at the Anniversary Meeting for 1838.

Mr. H. W. Rumsey, of Chesham, then read the Report of the Poor Law Committee.

Moved by Mr. Fletcher, of Croydon, seconded by Mr. P. Martin, of Reigate—

That the Report of the Poor Law Committee now read be adopted and printed.

After some conversation it was determined that this Report should be considered on the following day.

It was then moved by Dr. Œneas Cannon, of Cheltenham, seconded by Dr. James Johnstone, of Birmingham—

That the following gentlemen—Dr. Barlow, Mr. Crosse, Dr. John Conolly, Dr. Lyon, Mr. Hetling, Mr. Soden, and Dr. Forbes, be a Committee to consider and determine on the subject of a Thackeray Prize, and report to the meeting to-morrow.

On the motion of Mr. Cooke, of Cheltenham, seconded by Mr. Eves, of Cheltenham—

That it appears desirable to this meeting that the members of the Association, in their several localities, should urge upon the members of the Legislature, the importance of an enlightened consideration of the questions touching the public health, pending in Parliament.

On the motion of Mr. Fowler, of Cheltenham, seconded by Mr. Crosse, of Norwich—

That the following members be a Committee to draw up a Report on the replies to the queries issued by the Council, respecting the spread of the late epidemic influenza; and that the Report be published in the sixth volume of *Transactions;* and that those members who have not already sent replies to the queries, be requested to take an early opportunity of so doing: Dr. Malden, Dr. Feild, Dr. Streeten, and Mr. Addison.

On the motion of Dr. Shapter, of Exeter, seconded by Dr. Rumsey, of Amersham—

That this meeting suggests to the members generally, the propriety of lending their aid to carry into effect the Act that has recently passed the Legislature, to procure an improved registration of births, deaths, and fatal diseases.

On the motion of Dr. Theodore Boisragon, of Cheltenham, seconded by Mr. Soulby, of Ash, Kent—

That at the present juncture, in which it is probable that important changes may take place, it is highly expedient to watch over the interests of the profession at large, and that a Committee be appointed, consisting of the following members, with power to add to their number, whose duty it shall be to suggest to the Council, from time to time, such measures as may appear to them necessary to meet circumstances as they arise: Dr. Barlow, Mr. Crosse, Dr. Rumsey, Mr. Soden, Dr. Streeten, Mr. H. Rumsey, Dr. Forbes, Mr. Jordan, Mr. Addison, Mr. Ceeley, and Mr. Soulby.

Dr. James Johnstone, gave notice of a motion—

That any member of the Association wishing to compound for his annual subscription, may do so by paying ten guineas, which amount shall, in all cases, be invested in public securities, and the interest arising therefrom be appropriated to the general purposes of the Association.

MEETING HELD AT THE MONTPELLIER ROTUNDA, THURSDAY MORNING, JULY 20TH.

Dr. Boisragon having taken the chair, Dr. Barlow rose and said he had a subject to bring before them, which did not require many words. From the extent of their Association, comprising, as it did, most of the provincial faculty of the kingdom, it was right that they should approach their youthful and beloved Sovereign, with an expression of their dutiful homage and allegiance. He then read the following Address.

ADDRESS TO THE QUEEN.

May it please your Majesty,

We, the Members of the Provincial Medical and Surgical Association, cannot suffer the auspicious commencement of your Majesty's reign to pass over, without expressing the sincere and ardent loyalty with which we hail your Majesty's succession to the throne which your lamented predecessor so ably and worthily filled.

As individual members of the community, there are none among our fellow-subjects who more justly appreciate the blessings of the political constitution under which we live, or who would more zealously defend it against the inroads of either rancorous foes, or indiscreet friends. While we are aware, that in many respects, amendments of even time-hallowed ordinances are needed; in seeking their correction, we would carefully and vigilantly protect those bulwarks of our liberties which have so long and so successfully sustained us amid the revolutionary struggles by which so many Continental States have been and still are agitated.

In the sincerity of our hearts we approach your Majesty, to tender to you the respectful homage of our dutiful allegiance, and to express our ardent hope that your Majesty may long wield the sceptre which an All-ruling Providence has placed in your hands, to your own glory, the prosperity of your dominions, the maintenance of civil and religious liberty, and the welfare and happiness of all classes of your Majesty's subjects.

Cordially uniting in sincere attachment to your Majesty's person, and in veneration for the high office which you hold, we fervently pray that your days may be long in the land; and that the generous and enlightened purposes so graciously announced in your Majesty's first public declaration, may be so effectually realised, as to shed over your Majesty's reign that true glory which the diffusion of religion and piety, the distribution of equal justice, the advancement of literature and science, and the cultivation of the arts of peace never fail to impart. In the exercise of such functions, may your Majesty ever find the rich reward of an approving conscience, and may the success of your benevolent and enlightened endeavours be such, as eventually to embalm the memory of your reign in the hearts of an united, prosperous, happy, and grateful people.

He concluded by moving—

That the Address now read be adopted, and presented to her Majesty by a Deputation, consisting of Dr. Boisragon, President; Sir A. Cooper, Bart.; Dr. Kidd, one of the Vice-Presidents; Dr. James Clark; and Dr. Hastings, Secretary.

Dr. John Conolly said that to him had been consigned the honour of seconding the Address to their youthful and much beloved Queen; and although it was desirable carefully to exclude all general subjects from the meeting, he could not but express the pleasure which it gave him to contribute in expressing attachment to one whose youth, whose virtues, whose careful education, whose regal dignity, and the evident possession of the best feelings of a woman, contributed to blend their loyalty with an enthusiasm rarely felt towards crowned heads. He had noticed with particular pleasure the allusion in the Address to the encouragement of scientific pursuits, and he trusted the new reign would, in that respect, be the commencement of a new era, in which due honour would be paid to all who contributed to increase the knowledge and happiness of mankind. Although he was addressing a medical meeting, he might say, without impropriety, that no men were more largely engaged in such honourable duties

than medical men, and he hoped and believed that henceforth they would meet with distinction from royalty without the necessity of practising any of the arts of Court intrigue, and solely by pursuing the open path which led to science and to truth.

It was subsequently agreed, on the motion of Dr. Forbes, of Chichester, seconded by Dr. Malden—

That the mover and seconder of the Address should be added to the Deputation.

Dr. James Lomax Bardsley, was then called on by the President to read his Retrospective Address.

At the conclusion of the Address, which was most enthusiastically received, Dr. Forbes said it was fortunate that the spontaneous and heartfelt acclamations which had greeted the Address, rendered it unnecessary for him to speak at any length; he regretted that he was incompetent to express his deep sense of the excellence of the Address; he was fully conscious of the difficult task Dr. Bardsley had had to encounter, and of the talented manner in which he had performed that task; he would propose—

That the thanks of this meeting be given to Dr. Bardsley for his excellent Address, and that he be requested to print the same.

This was seconded by Dr. Symonds, of Bristol, and carried unanimously.

Dr. Baron being now called upon by the Chairman, read the following Report of the Benevolent Committee, and prefaced it by some remarks as to the object that Committee had in view, which was to relieve members who had fallen into unavoidable misfortunes.

REPORT OF THE BENEVOLENT COMMITTEE.

The Committee of the Benevolent Society have the satisfaction of reporting to the Association that they have been en-

abled, by the liberality of the subscribers, to bring the fund into operation. Two cases of distress have been brought before them; and they are happy to have had it in their power to administer relief in both. To one gentleman they alloted fifty pounds, to another ten. For reasons which are perfectly obvious, the Committee cannot, on this occasion, bring the situation of the individuals who have partaken of the bounty of the Society more particularly before the Association. They beg leave, however, to assure the members that the awards were made in conformity with the principles of the Society, and the regulations adopted for its guidance; and they have the satisfaction of believing that the aid, in both instances, was most seasonable.

As the Society has actually commenced its beneficent career, the Committee feel an increased desire to bespeak the favourable consideration of all the members of the Association in its behalf. The funds are still extremely limited, and unless they shall be materially increased, many cases that call loudly for help must necessarily be rejected. The Committee, therefore, earnestly hope that a scheme which is beginning to produce valuable results, will not be allowed to drop for want of timely succour. They, with great diffidence, presume to offer any suggestions for augmenting the fund: now, however, that the members of the Association amount to nearly one thousand, the time is come when it may be asked, whether the hint thrown out in the outline, presented to the meeting at Bristol, might not be acted upon? A trifle (say five shillings) from each member would produce nearly two hundred and fifty pounds per annum. It would not, of course, be right to limit the contributions to this sum, and the larger would still continue to be paid, but the smaller contributions now specified, would immediately give the Benevolent Society a considerable income, and would identify it with every member of the Association.

Should this plan be adopted, another most important object might be gained. The payments to the Association and to the Benevolent Fund might be simultaneously collected, and

immediately handed over to the Treasurers. The Committee would next suggest that increased efforts should be made to swell the amount of donations and bequests, as it is from these sources that it is proposed to afford permanent relief to such members of the profession as may be rendered incapable of pursuing their labour. The amount of the fund, which is to be set apart for this object, at present is very small, but we cannot doubt that it will increase when its claims are better known.

ACCOUNTS OF THE BENEVOLENT FUND OF THE PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION.—1836-7.

Receipts.

	£.	s.	d.	£.	s.	d.
Donations	51	11	0			
Annual Subscriptions	23	1	0			
				74	12	0
Balance in hand, July, 1836				116	10	9
				191	2	9
Disbursements as below				75	19	9
Balance in hand				£115	3	0

Disbursements.

	£.	s.	d.	£.	s	d.
Liverpool Bill for Printing	7	8	8			
Cheltenham ditto	7	18	6			
Postage and Parcels	0	12	7			
				15	19	9
To the cause of the Charity				60	0	0
				£75	19	9

(Signed) JOHN BARON,
WILLIAM CONOLLY.

DR. HOLME then moved the following resolutions :—

That the Report now read be adopted and printed.

That the Association do take this opportunity of expressing their thankfulness that the Benevolent Fund has been rendered

useful to some of their suffering brethren; and that the suggestions contained in the Report for increasing and collecting the contributions, be earnestly recommended to the consideration of every member of the Association.

That the Central and other Committees appointed for carrying on the business of the Benevolent Fund, be requested to continue their services.

That the rules and regulations of the Benevolent Fund be printed,* with the account of the transactions of this meeting.

The motion was seconded by Dr. W. Conolly, and carried unanimously.

Dr. Davis, of Presteign, in a highly flattering manner, proposed that their visitor, Dr. Macartney, Professor of Anatomy, Trinity College, Dublin, be elected an honorary member of this Association, which being seconded by Mr. Crosse, of Norwich, was carried by acclamation.

The Secretary, Dr. Hastings, then read the following letter from Dr. Thackeray:—

"Chester, June 26, 1837.

"My dear Sir,—I hope to make my offering in the service of our profession more acceptable to the Council, and more encouraging to candidates, by the additional order of twenty-five pounds, the amount being now fifty, which I herewith enclose. (Pray let me know if you agree to the prize being fifty pounds.)

"There is a standard sum which, without considering it in a pecuniary view, is found sufficient to induce competition amongst those of the best attainments, in every department of literature and science. Twenty pounds is not that sum, but fifty may be, and my desire is to induce such to become competitors for a prize that is intended to increase the character of our profession, by the exercises of the younger members, and to serve the cause of humanity, by leading to new investigations into the nature of disease, or into the remedies by which they may be removed or relieved.

* See Appendix A.

"The Council will best determine the subject to be discussed, and every thing connected with the matter; I would only add that (if it be not already so decided,) it is my earnest wish that the field of competition be open to the members of every accredited school for medicine and surgery in the United Kingdom. The eminent men who have appeared in the Irish Colleges, in both departments of our profession, are evidences of the excellence of the instruction obtained in them; and it is my hope that they will become partners in a generous rivalry, where the intention is the advancement of such important objects as I have above stated.

"Being now of an age that places me very high up in the seniority of practitioners, I am happy I am able to make this little tender of my regard for my profession, without any inconvenience to my immediate family; and I feel satisfied that all of my name will think I have acted right in so doing,—bearing in mind how many of the house have been successful, and, I trust, respected by their brethren for their conduct as members of the profession; and how much, whether members or not, they owe to their parent, who for half a century stood distinguished for professional character and conduct, and was enabled to support a family unusually large, and bring them into life with all the advantages which the best schools of instruction in our country afford—an example to all parents of every profession.

"Believe me, dear Sir,

"Your faithful Servant,

"To Dr. Hastings. "W. M. Thackeray."

REPORT OF THE PRIZE ESSAY COMMITTEE.

The Committee appointed to determine on a subject for the Thackeray Prize, beg leave to report, that the time allowed them has been much too short for such a deliberate selection as would merit the approval of the Association. They therefore solicit an extension of the time to two months from the

present period, which will enable them to judge how the objects of the liberal contributor of the prize may be best attained. They suggest that the Essay should not be required before the 1st of May, 1839.

Dr. Webster, of Dulwich, seconded by Dr. Mc Cabe, of Cheltenham, proposed—

That the highly important Report of the Poor Law Committee be read.

This was accordingly done by Mr. H. W. Rumsey, of Chesham, Secretary to that Committee, as follows :—*

SECOND REPORT OF THE POOR LAW COMMITTEE OF THE PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION.

The Poor Law Committee having been requested once more to direct their attention to the present state of the question of parochial medical relief, submit the result of their deliberations to this meeting of the Association.

Seeing that the evils detailed in the Report of last year continue unabated, notwithstanding the steps taken by this Association and by the profession at large, your Committee deem it highly important, at the present juncture, that energetic measures should be pursued, to urge this matter upon the attention of the Legislature and the public, until a parochial or national system of medical relief be settled upon a basis equally humane to the poor and just to medical practitioners.

With a view effectively to make known the opinions and feelings of this Association, your Committee recommend that personal and written communications be made by members of the Association, in every locality, to their respective Repre-

* Just published, the second edition of the Report of the Committee, appointed at Oxford, to consider the best means of affording medical relief to the sick poor, and more especially with reference to the operation of the New Poor Law Act, with an Appendix, containing important information relative to the state of medical attendance in several Unions.—London: Sherwood and Co.; Deighton, Worcester.

sentatives in Parliament; also that petitions be presented immediately on the assembling of Parliament, praying for a *special*, full, and impartial inquiry into the subject of medical relief for the poor, and for the production of official returns of all medical contracts made under the new law, of the number of practitioners appointed to the care of the sick poor compared with those under the former system, of the extent of districts entrusted to medical officers, of the amount of their salaries, the mode of their appointment, the number of patients attended, and visits performed by each medical officer; lastly, that a plan for an amended system be prepared and placed in the hands of some influential members of the Legislature, who might be disposed and able to undertake the management of the question in both Houses of Parliament.

If, after the adoption of these measures, there be not a fair prospect of redress by Parliament, it is the opinion of your Committee that members of this Association ought no longer to sanction a system alike degrading to themselves, and cruel and delusive to the sick poor; to use the words of the first Report they ought "firmly to decline any participation in the medical appointments of the New Poor Law."

If the profession had been true to itself, and if medical men had, in private, acted up to those declarations which they have so strenuously made in public, the matter would have long ago been equitably arranged; but whilst unprofessional, mean, and selfish conduct, in so many instances, continues to disgrace our body, we cannot wonder that the authorities should take advantage of such delinquencies, to effect their ill-judged projects of economy.

The influence of this Association ought to be exerted upon its members, to induce them not to swerve from those admirable professional principles by which we profess to be actuated.

(The following recommendations for legislative enactment were, for the sake of brevity, not read at the General Meeting.)

The outlines of a measure for parliamentary enactment were suggested in the first Report of your Committee.

In the further consideration of this difficult subject, much valuable assistance has been derived from the pamphlets of Mr. Yeatman, Dr. Yelloly, and Mr. Addison.

Your Committee have also received several communications from members of the Association, (some of which have been recently published in the *Lancet* and *Medical Gazette*,) containing many suggestions which might be advantageously adopted.

1. The first point, which appears to be sufficiently established, is the necessity for a general professional superintendence of the whole body of Union Medical Officers, (vide §. 47, first Report,) and an uniform regulation of all matters relating to attendance on the sick poor, which might be conducted by a POOR LAW MEDICAL BOARD, or by ONE OR TWO MEDICAL COMMISSIONERS, practically acquainted with medico-parochial duties, possessing the confidence of the profession, and exercising powers similar to those with which the heads of the Army and Navy Medical Departments are invested.

Your Committee would observe, that the greater the independence of the medical department of the Poor Law administration, the more efficiently would the important business of this department be executed; and they look forward with hope to the period when a *Poor Law Medical Board* may form a section of a grand *National Board of Health*.

The medical officers of Unions should furnish complete reports to the medical superintendents, and be responsible only to them for the proper performance of their duties. Without medical supervision and control, your Committee believe that no alteration in the mode of appointment and remuneration will remedy the abuses of the present system, or secure the welfare of the patients.

2. *The provision of medicines* should be separated from that of medical attendance.

Under the superintendence of a Medical Board, the Unions might be economically supplied with genuine medicines, and all temptations to withhold necessary remedies from the sick

would thus be removed from the medical officer. (Vide §. 46, first Report.)

If the separate provision of medicines be not universally practicable, for instance, in villages, where the practice among the poor is insufficient to warrant the expense of a distinct establishment for dispensing medicines, the resident practitioner might still continue to supply them, keeping an accurate account of the quantity consumed, for which he might be paid at prime cost, or an equal quantity might be returned to him, at stated times, from the Union Dispensary. *In no case* should the *depôt* for medicines be distant from the residence of the medical officer.

3. The system of determining *the amount of remuneration by* "*Tenders*" should be entirely abolished, and the rate of medical charges or salaries should be determined by parties, responsible, not only to the rate-payers, but also to the medical profession.

The difficulty of effecting uniformity in the rate of remuneration, by the same method, in every locality, with satisfaction to both parties, and the presumed indisposition of the Legislature to interfere with the local authorities in such details, induce your Committee to suggest that *two or three Assessors* might be appointed for each county or large district; one or two of whom should be elected by the Guardians of the Unions, and the other by the resident medical practitioners. These Assessors should have full power to fix the rate of remuneration in every locality.

4. The form of remuneration has been the subject of much discussion.

The substitution of parochial contracts, at fixed sums, in place of the ancient method of specific payments for attendance and medicines afforded to the sick poor, appears to have arisen partly from the great increase of pauperism which preceded the enactment of the New Law, and which would have raised the sum total of such payments to a very high amount, but principally from the liability to exorbitant charges, in the absence of any sufficient check against abuses; but cir-

cumstances are now changed, and, therefore, the necessity for such contracts greatly diminished. If the temptation to supply medicine in an unnecessary quantity, or in an expensive form, were removed, by the separate provision thereof at the cost of the Unions—if the charges for attendance were fixed by competent Assessors—if the amount of attendance afforded to the specified cases were subject to the strict investigation of a Medical Board—and, finally, if this investigation were rendered more practicable, and the total expenditure of the rates reduced by a progressive diminution of pauperism, there could be no valid objection against a return, *partially*, if not *wholly* to *specific charges*.

Such charges appear more especially necessary for the following duties and exigencies.

1st. Journeys beyond one mile from the medical officer's residence.—2nd. Midwifery.—3rd. Surgical operations, and the care of important fractures and dislocations.—4th. Vaccination.

1st. For journeys. A graduated charge at a given sum per mile, as there appears no method so simple and satisfactory for estimating the additional remuneration due to practitioners for the distance of parishes and patients; and it is clear that distance ought to incur increased remuneration, both because it is just to the medical officer, and because it would be an inducement to the authorities to appoint the nearest medical resident.

One journey only in a day to any parish or hamlet, whatever may be the number of patients, should be chargeable, except an urgent summons require the medical officer to take a second journey to the same place on the same day, when a second charge should be allowed.

2nd. For midwifery, as a distinct branch of practice. Ordinary cases should be attended by a midwife, the surgeon being called upon only in special cases, when a fee of at least 1*l.* 1*s.* should be charged. Where no midwife resides, and where, consequently, the surgeon is accustomed to attend to all cases of labour indiscriminately, a fee of 10*s.* 6*d.* should be allowed; and, in addition, where cases are distant, the stated charges for journeys should be made.

3rd. The capital operations of surgery, and the care of important fractures and dislocations, as requiring *immediate*, extraordinary, and prolonged attendance, need a specific payment from 1*l.* 1*s.* to *3l.* *3s.* each; and, in addition, where cases are distant, the stated charges for journeys should be allowed.

4th. Vaccination. A small charge for each patient vaccinated is advisable, not only because where no remuneration is allowed vaccination is liable to be performed (as it often is at present,) in a slovenly and imperfect manner, but because the practitioner should have a direct interest in vaccinating as many persons as possible, and thus checking the ravages of small-pox among the community.

If specific charges for the above extras be conceded, your Committee are of opinion that fixed salaries for attendance on ordinary cases of sickness or accident might be adopted, without injury to the patient or the surgeon.

To the various methods proposed for calculating the amount of medical salaries, weighty objections have been made; but there is *one method*, recently suggested, which appears to your Committee to be as free from objection as possible, viz., a salary bearing a given ratio to the sum expended in each parish for the relief of the poor; in other words, a certain per centage on the poor-rates.

Such a salary would be in proportion to the *number of paupers*, to the *amount of sickness*, and, therefore, to the extent of duty performed by each medical officer.

If the medicines, &c., were furnished by the Unions, and if the preceding extra charges were allowed, a sum varying from four to six per cent. on the poor-rates, would probably suffice for the medical salary in each parish.

Different counties would be found to require a variation in the rate of per centage; but of this the Assessors before proposed would be the proper judges; as also of the exact amount of the charges for the several items proposed for extra remuneration.

For workhouses the best method of calculating a salary,

would be by a payment per head, varying from 3*s*. to 4*s*. per annum, on the average weekly number of paupers in the house. These payments might be deducted from the respective parochial salaries, according to the number of inmates in the workhouse belonging to each parish.

5. The medical duties of Unions should be entrusted to as great a number of resident practitioners as is practicable, because, by this means, a more prompt and efficient attention would be secured to the sick.

The appointment of a medical officer to the care of any parish, should be determined, not merely by his fitness for the office, but by the convenience and facility of communication, as regards both the poor and himself.

For these reasons all the resident medical men, who possess the requisite qualifications, should, before the appointments are made, be permitted to signify their readiness to act, and to arrange among themselves, as to the extent of duty or limits of the district to be undertaken by each; the Board of Guardians dividing the Union among them, in case they fail so to arrange.

The division of every large parish among two or more practitioners, is preferable to appointing them, in rotation, to the whole of it.

Having suggested a method by which the minute division of medico-parochial duties might be accomplished, without removing the appointment of medical officers from the Board of Guardians, your Committee would again refer to their first Report, § 48, in which the right of electing the medical officer is proposed to be restored to the rate-payers of each parish.

By this means extensive medical districts would be effectually prevented, the independence of the medical profession would be protected, and the most convenient and suitable arrangements, both as regards the inhabitants of the parish and the medical men, would be insured.

The best mode of conducting such elections would be as follows:—those practitioners who are desirous of being elected, might send their names to the Board of Guardians, stating to

what parish or parishes they were desirous of attending; the Board might then limit, according to some fixed regulation, the extent of duty to be undertaken by any surgeon, and the names of candidates, with such restrictions, might be transmitted to the several parishes.

The votes of the rate-payers, in the election of medical officers, should be given in writing; and the mode of ascertaining the majority of suffrages, should be the same as that now in force for the election of Guardians.

In case the elected surgeon be disqualified, or die, or be dismissed, or resign, the Board of Guardians might appoint a successor until the next annual election.

The medical attendants of the Union Workhouses should still be appointed by the Board of Guardians

6. The qualifications of Parochial Surgeons should not be confined to the ordinary testimonials, diplomas, and licenses, which are necessarily deficient as tests of practical skill; but should embrace a certain length of ordinary practice (not less than two or three years,) in the neighbourhood.

The lives of the poor should never be entrusted to the care of those medical men who have not fully proved themselves competent to treat the diseases of that portion of the community which has the privilege of selecting its own medical attendants.

7. The propriety of affording medical relief in every case of sickness or accident, should be judged of solely by the medical officer, who should be authorized to relieve the applicant at once if necessary.

The inquiry into the *circumstances* of the patients should, *in all urgent cases*, as your Committee have before recommended, be deferred until relief has been afforded.

If any person has received attendance whose circumstances, upon investigation, do not entitle him to parochial aid, the medical officer ought to be protected from loss, and the poor-rates from expenditure upon improper objects, by the Board of Guardians recovering from such patient, a payment proportionate to his means. (Vide § 49 of first Report.) In other

words, the medical relief might be afforded, in certain cases, "by way of loan," to be repaid by weekly instalments, according to the provisions of the 58th and 59th sections of the Poor Law Amendment Act. Thus the form of an order might be dispensed with, while prompt attention would be insured to the sick, and the condition and capabilities of the persons for whom medical assistance is required, would undergo a far stricter investigation than is at present practicable.

Your Committee, in thus bringing their labours to a conclusion, cannot refrain from expressing a confident hope that the subject which has for so long a period engaged their attention, will be prosecuted to a successful issue, by the energies and decision of the Association; and they have much satisfaction in resigning the further conduct of this matter, into the hands of the Committee of this Association, which has just been appointed, "to watch over the interests of the profession, and to suggest to the Council, from time to time, such measures as may be necessary to meet circumstances as they arise."

The legal provision of medical relief for the poor is of too much importance in all its bearings to escape their vigilant attention.

Dr. Webster, of Dulwich, then moved, and Mr. Addison seconded the resolution—

That a petition be drawn up, in conformity with the recommendations of the Poor Law Committee of this Association, to be signed by the President, on behalf of the meeting, and to be presented to both Houses of Parliament immediately on their assembling.

COPY OF THE PETITION.

The Petition of the President, Council, and Members of the Provincial Medical and Surgical Association, assembled at the Fifth Anniversary Meeting, at Cheltenham,—HUMBLY SHEWETH—

That your Petitioners deprecate the system of medical relief adopted by the Poor Law Authorities.

That the *greatly diminished and insufficient supply of medical officers* must lead to the neglect and injury of the sick poor, and to the increase of those monopolies of parochial practice which were among the acknowledged evils of the old system.

That the *extent of medical districts*, in general, precludes that prompt and convenient performance of medical duties which is essential to the proper treatment and the safety of the sick paupers.

That the procuring of medical officers by *public advertisement and "Tender"* (a practice degrading to the profession,) is injurious to the public, because it cannot afford a sufficient test of the qualifications and practical skill of the candidates, and, consequently, is not calculated to provide humane and efficient attendance for the sick poor.

That *dictating, either with or without tender, stipends* far below the conventional value of the services required, and any rational calculation of their cost, with the *alternative of the introduction of strangers*, is another mode of competition equally unfair to the resident and experienced practitioners, and unjust and injurious to the poor.

That vesting in the hands of the relieving and parish officers the power of deciding whether the sick pauper requires medical aid, is calculated to prolong disease and endanger life.

That entrusting to non-professional persons, such as Poor Law Commissioners, and Boards of Guardians, the power of superintending and controlling, justifying and condemning the conduct and proceedings of the medical officers, is neither just nor judicious, and is not in accordance with the practice pursued in other departments of the public service.

That as the entire system is unjust and derogatory to the medical profession, detrimental to science, injurious to the community, and cruel and delusive to the sick poor, your Petitioners humbly but earnestly hope that your Honourable House will be pleased to direct a *special, complete, and impartial* inquiry into the subject of medical relief, and grant an order for the production of official returns of all medical contracts made under the Poor Law Amendment Act; of the

number of medical officers appointed, as compared with the former system—of the extent of their respective districts—of the amount of their salaries—of the mode of their appointment—of the number of patients attended, and visits performed by each medical officer; and, finally, enact such remedies as to your wisdom shall seem fit.

And your Petitioners, as in duty bound, will ever pray, &c.

(Signed) HENRY C. BOISRAGON, President.

FORMS FOR OFFICIAL RETURNS FROM EVERY UNION IN ENGLAND AND WALES.

1.—The number of medical practitioners *appointed* to the care of the sick paupers, in the various parishes comprised within the Union, on the average of three years previous to the formation of the Union.

2.—The number of medical practitioners *contracted with* for the care of the sick paupers, during each year since the formation of the Union.

3.—The number of medical practitioners employed by the medical contractors, (with the consent of the Board of Guardians,) as *deputies*, during each year since the formation of the Union.

4.—The number of parishes in the Union which *do not contain a resident* medical officer; and the number which *do not contain a resident* qualified medical practitioner.

5.—The greatest length and breadth, in miles, of each *medical district;* and the greatest possible distance of any part of each medical district from the medical *contractor's* residence.

6.—The total number of cases of sickness, of accident, and midwifery, attended by every medical officer, during each year since the formation of the Union; the total *recoveries* and the total *deaths* during the same periods.

7.—The number of visits and attendances, (including those at the houses of the sick poor, at the workhouses, and at the medical officer's residences,) as signified by the weekly reports of each medical officer, during each year since the formation of the Union.

8.—The total remuneration paid to each medical officer, during each year since the formation of the Union.

9.—The total medical expenses of the various parishes comprised within the Union, on the average of three years previous to the formation of the Union.

10.—The population of the Union in 1831.

11.—The number of square miles in the Union.

12.—The total expenditure for the relief of the poor, in the various parishes comprised within the Union, on the average of three years previous to the formation of the Union.

13.—The total expenditure for the relief of the poor, during each year since the formation of the Union.

14.—The *average* weekly number of persons (families of married men included,) receiving relief in the various parishes comprised within the Union, *for three years* previous to the formation of the Union.

15.—The average weekly number of persons (families of married men included,) receiving relief since the formation of the Union, distinguishing the number in and out of the workhouse; also the number of aged, infirm, lunatic, idiotic, orphans, and illegitimate children; also the number receiving relief merely on account of the temporary sickness, either of themselves or their families.

16.—The number and the names of medical officers introduced by the Board of Guardians, and *not in practice* in the Union before its formation.

17.—The number and the names of medical officers who have been dismissed, or who have been discontinued at the termination of their contracts, by resolutions of the Board of Guardians, and by orders of the Poor Law Commissioners; with the alleged causes for every such dismissal or discontinuance.

18.—The number of *censures* passed on the medical officers, and admonitions conveyed to them, by resolutions of the Board of Guardians, since the formation of the Union.

Moved by Dr. Malden, and seconded by Dr. Coley—

That a form of letter, in conformity with the recommendations of the Poor Law Committee, be forthwith prepared and printed, and be transmitted with a copy of the petition, without delay, by every member of this Association to his Parliamentary Representatives and friends.

On the motion of Dr. W. Conolly, and seconded by Mr. Fowler—

A vote of thanks was passed to the Poor Law Committee, especially to Mr. Rumsey, for their important and invaluable services.

On the motion of Dr. Ring, seconded by Dr. Bompass—

That as the Association, in accordance with the sentiments expressed by the Council, in their excellent Report, feels persuaded that an extensive series of observations, made in the various Sanitary Institutions of the kingdom, would contribute essentially to the progress of medical science, a Committee be appointed to draw up tabular forms for statistical records of disease.

It was then resolved on the motion of Dr. Bardsley, seconded by Dr. Feild, of Worcester—

That the thanks of this meeting be given to the Managers of the Literary and Philosophic Institution; Mr. Jearrad, the Lessee of the Montpellier Spa; to Miss Haich, the Lessee of the Old Well; Mr. Seymour, the Lessee of Pitville; Mr. Lee, the Librarian, &c.; for their liberality in throwing open their respective establishments to the members of the Association.

Dr. Boisragon having, on the motion of Dr. Hastings, left the chair, it was taken by Dr. Conolly, when Mr. Soden proposed, and Dr. Rumsey seconded—

A vote of thanks to Dr. Boisragon, for his urbane, courteous, and talented conduct in the chair.

The compliment having been suitably acknowledged by Dr. Boisragon, the meeting separated.

APPENDIX A.

RULES AND REGULATIONS

OF THE

BENEVOLENT FUND

OF THE

MEDICAL AND SURGICAL ASSOCIATION.

CONSTITUTION AND NAME OF THE SOCIETY.

Before specifying the rules which are to direct the proceedings of this Society, it is proper to repeat, in this place, the main principles on which it is established. It is not intended either to be a Benefit Society, or an Assurance Club; but, strictly speaking, a Benevolent or Charitable Institution, founded and promoted for the express purpose of assisting our professional brethren, when struggling under the pressure of disease or other calamities. It is likewise proposed, under circumstances of peculiar urgency and distress, to administer relief to the widow or family of a professional man, who may have been deprived of the support and protection of a husband or parent. While, therefore, the sole design of this Society is to hold out the hand of charity and benevolence to a suffering and afflicted brother, or his family, it will not countenance improvidence or idleness, or evil habits of any kind.

The principle above stated has received the sanction of three successive meetings of the Provincial Medical and Surgical Association; and the following resolutions were finally adopted at the Anniversary, held at Manchester, July 20 and 21, 1836.

1.—That a charitable fund be created by donations and subscriptions of members of the Association, to be called the Benevolent Fund of the Provincial Medical and Surgical Association.

2.—That contributions be received from all persons friendly to the objects of the Society, though belonging neither to the Association, nor to the profession.

3.—That the object of the fund be the relief of medical men* under severe and urgent distress, occasioned by sickness, accident, or any other calamity.

4.—That any medical man labouring under such afflictions, be considered a fit object for the Charity.

5.—That the claims of contributors shall, as far as possible, have the preference; but that contributions to the fund, give no claim of right to relief, the fund being one of pure charity, and that each case be judged according to the urgency of the distress.

6.—That under circumstances of peculiar emergency, relief may be extended to the widows and orphans of medical men, it being understood that it is not the design of this fund to relieve medical men from the necessity of providing for their families by ordinary life insurances, and such other means as prudence dictates.

7.—That the management of the fund be conducted by Committees of the contributing members, annually appointed; the Central Committee to be at Cheltenham, and Local Committees, subordinate to the Central, in each of the principal cities and towns: the Central Committee having power to appoint Local Committees, wherever they may be required.

As the granting of annuities or loans must altogether depend upon the amount of the pecuniary means entrusted to the Society, it is unnecessary to say more than to observe that a distribution of the funds calculated to meet these objects is recommended in a subsequent page, should the accumulations enable the Society to act upon them.

* The Society will not acknowledge any one as a fit object of relief, who has not received a regular professional education, and who is not either a Doctor of Physic, a member of the College of Surgeons, or of the Apothecaries' Company.

MANAGEMENT OF THE SOCIETY.

The business of this Society shall be managed by a Central Committee, and by Local Committees, distributed throughout the kingdom. The following Committees have been already appointed.

Central Committee.

CHELTENHAM.—Dr. Baron, Dr. Conolly, Dr. Bernard, Mr. Murley, Mr. C. T. Cooke.

Local Committees.

LIVERPOOL.—Dr. Brandreth, Dr. Jeffreys, Dr. Scott, Mr. Dawson, Mr. Bickersteth.

MANCHESTER.—Dr. Holme, Dr. James Bardsley, Mr. Turner, Mr. Wilson.

BIRMINGHAM.—Dr. James Johnstone, Dr. Booth, Mr. Wickenden, Mr. Parsons.

HEREFORD.—Dr. Bleek Lye, Mr. Bevan.

BRISTOL AND CLIFTON.—Dr. Prichard, Dr. Fox, Dr. Symonds, Dr. W. Kay, Dr. Bompass of Fishponds, Mr. Hetling, Mr. Smith.

MONMOUTH.—Dr. Holbrook, Mr. Brewer of Newport, Mr. Prosser, Mr. Wilson.

BATH.—Dr. Barlow, Dr. Blackmore, Mr. Soden, Mr. Tudor, Mr. Norman.

WARWICK AND LEAMINGTON.—Dr. John Conolly, Dr. Luard, Dr. Lloyd, Dr. Loudon, Dr. Thomson of Stratford, Mr. Hiron, Mr. Pritchard.

WINCHESTER.—Dr. Crawford, Mr. Wickham, Mr. Lyford

GLOUCESTER.—Dr. Evans, Mr. Wilton, Mr. Carden.

NORTHAMPTON.—Dr. Robertson, Dr. Kerr, Mr. Terry.

OXFORD.—Dr. Kidd, Dr. Daubeny, Mr. Wingfield, Mr. Hitchings.

WORCESTER.—Dr. Malden, Dr. Hastings, Dr. Streeten, Mr. Carden.

CHICHESTER.—Dr. Forbes, Dr. M'Carogher, Mr. Burnall.

SHREWSBURY.—Mr. Clements, Mr. Crawford, Mr. Griffiths.

It will be the object of these Committees to make known the designs of the Society in their several districts; to collect donations and subscriptions, and to transmit them to the Treasurer; and to receive applications for relief.

As soon as possible, after such applications have been made, it will be the duty of the several Committees thoroughly to investigate the nature of the claims. The Society will hold them answerable for this very essential service, and doubtless they will perform it, with all the kindness and impartiality that the case requires, looking well both to the moral and professional character of the applicants, so that the funds of the Society may never be improperly employed.

The Committee having satisfied themselves that the case is worthy of the bounty of the Society, will, as soon as possible, report their opinion to the Central Committee, specifying the nature of the claims, and the amount of relief they think ought to be administered. This statement must be signed by not less than two members of each Committee.*

When two or more cases are presented about the same time, if all cannot be satisfied, the Committees shall be guided entirely by the urgency of the claims in apportioning the bounty of the Society.

On other occasions, where the claims are nearly equal, priority of application shall direct their decision.

GENERAL MEETINGS OF THE SOCIETY.

A General Meeting of the contributors of the Society shall be held once in each year, at the time and place of the Annual Meeting of the Provincial Medical and Surgical Association.

* This reference to the Central Committee appears quite indispensable, for if every Local Committee had the power of distributing the funds of the Society, it is manifest that great difficulties might arise. It is necessary, therefore, that there should be one body to which all claims may be made known; not for the sake of deciding upon the merits of the claims, for that decision must rest with the several Local Committees, but to determine the amount of relief that the funds of the Society will admit of.

At this meeting, all who are contributors to the amount of 1*l.* 1*s.* per annum, or donors of 20*l.* or upwards, at one time, shall have a voice: they shall likewise be entitled to recommend cases for the bounty of the Society.

At each Annual Meeting, Reports of the different Committees shall be received and read; and the Treasurer's accounts examined and audited.

At the same meetings, any proposals for altering or amending the laws of the Society, shall be discussed and decided upon; but no such proposal can be entertained unless a copy, in writing, shall have been transmitted to the Central, and the several Local Committees, at least three months before the Annual Meeting.

FUNDS.

All monies received by the different Committees, as soon as possible, are to be paid into the hands of the Treasurer; and it shall be his duty immediately to deposit the same with the Bankers of the Society: the annual subscriptions in one account, and the bequests and donations in another.

The annual subscriptions are to be devoted exclusively to meet those applications for relief from medical men and their families, which have been especially contemplated in the formation of the Society. From the same source, likewise, are to be defrayed the expenses which may be incurred in the management of the Society.

The bequests and donations shall be regularly put out to interest, as an accumulating fund, the interest of the same being regularly appropriated to increase the capital, till the sum accumulated shall amount to £——

When a fixed annual income shall have thus been obtained, from the interest of the accumulated capital, that income may be applied, with the concurrence of a majority of the several Committees, to the granting of pensions or annuities to such deserving members of the profession, as may have been rendered incapable of following their profession, by age, disease, or any other infirmity.

As the granting of an annuity will entail much more serious expense upon the Society than such casual relief as is for the most part contemplated, it is desirable that no such annuity should be granted, until the sentiments of the different Committees have been ascertained. Proposals for relief of this kind must, therefore, in the first instance, be made to the Central Committee, whose business it will be to submit them to the Local Committees, and collect their sentiments.

After the accumulating fund has reached the amount already specified, a subsequent increase of capital, from bequests or donations may be employed as a loan-fund, under the following regulations :—

The sum lent in no case to exceed 100*l*.

The borrower to have the use of that sum without interest, on giving good and sufficient security that it shall be repaid to the Society at the end of twelve months, at the latest. The same regulations to be followed in cases of this kind as in those laid down in respect of annuities.

All orders for money from this Society to be signed by, at least, two members of the Central Committee, together with the Treasurer.

As all the objects of this Society are of a purely charitable or benevolent nature, it is scarcely necessary, in conclusion, to observe, that it it highly desirable that its affairs should be conducted with as little expense as possible. The gentlemen who belong to the different Committees will doubtless bear this in mind. All of them are labouring in one beneficent design, and whatever may be suitable for one district, will be suitable for all. This remark especially refers to such papers or documents as it may be necessary to distribute for the information of the public, or of the members at large. For very obvious reasons, it is most desirable that such documents should be printed at one place, in order that the expense of separate impressions, at different places, may be avoided.

All communications to the Central Committee to be addressed to the Treasurer and Secretary, Dr. Conolly, Castleton House, near Cheltenham.

PART I.

ARTICLE I.

THE RETROSPECTIVE ADDRESS,

DELIVERED AT THE

FIFTH ANNIVERSARY MEETING

OF THE

PROVINCIAL

MEDICAL AND SURGICAL ASSOCIATION,

HELD AT CHELTENHAM, JULY 19th and 20th, 1837.

BY JAMES L. BARDSLEY, M.D.

Physician to the Manchester Royal Infirmary, Lecturer on the Principles and Practice of Medicine, &c. &c.

When I behold before me many of those distinguished individuals whose learning and whose genius shed lustre upon the medical profession,—when I witness in this audience so numerous and enlightened an assemblage of provincial practitioners,—when I see so large a proportion of my professional brethren relying upon my own humble endeavours for that information which the Annual Retrospective Address, appointed to be delivered on occasions like the present, is expected to contain; it is impossible, even were I endowed with the

utmost amount of confidence and self-possession, that I should not experience an almost irresistible inclination to shrink from the task with which I have been entrusted. Encouraged, however, as I am, by the confident assurance that I shall obtain the indulgent consideration of the Association, I proceed at once to the discharge of this important duty.

It will of course be understood that I cannot, within the limits proper to be observed in the present address, enumerate all the improvements that have been effected in the various branches of medical science; and, therefore, I must endeavour to exercise some discrimination in the selection and arrangement of the more valuable contributions that have been made to the general stock of our knowledge within the period of the last year.

Amongst the several parts of which medicine consists, anatomy, as it holds the most important rank, first claims our attention; and, owing to the extent of cultivation which for many years has been bestowed upon this department, it will not be expected that any very numerous additions can have been made to it within a recent period. However, it appears from the research which I have been enabled to make, that some new and interesting anatomical facts have of late been supplied. Mr. Solly, who has recently distinguished himself by the assiduous attention which he has devoted to the brain and nervous system, has discovered the existence of certain fibres, which have hitherto escaped observation, ascending from the anterior columns of the spinal cord to the cerebellum, and forming thereby a bond of communication between these

two portions of the cerebro-spinal system.* It has been stated by Wutzer, that a branch of the thoracic duct enters the *vena azygos*—an observation, I believe, not previously published.† Some recent microscopical investigations into the intimate structure of the nerves and central parts of the nervous system have been made by Dr. Joseph Berres, Professor of Anatomy in the University of Vienna.‡ These researches, confirmatory in some respects of certain results obtained by Professor Ehrenberg, relative to the tubular form of the nervous fibre, shew, however, that this structure is not quite so simple and uniform as it was represented to be by that distinguished physiologist. The discovery of this peculiarity in the structure of the nervous fibre has also been confirmed in this country by the experiments of Mr. Andrew Prichard.§ The fact announced by Professor Arnold of the existence of a ganglion, which has been named the *otic*, on the third branch of the trigeminal nerve, has been corroborated by the dissections of Mr. Bennett, of Edinburgh. He represents its presence, however, as not being uniform.

In the department of physiology, I find that some interesting observations have been made by Professor Schultz, upon the comparative facility of the act of vomiting in the infant and adult. He has shown that its relative difficulty and infrequency in

* *Philosophical Transactions*, 1836.

† *Hannöversche Annalen, B. ii, H.* 1. 1836. Also *British and Foreign Medical Review*, October, 1836.

‡ *Medicinische Iahrbücher des k. k. Österreich. Staates; xviij. Bandes. 2d. Stück. Wien*, 1836.

§ *London Medical Gazette*, 1836.

the adult are dependant upon a difference in the conformation of the stomach, analogous to that which exists between the stomachs of the dog, cat, and other animals which vomit readily, and the stomachs of those which seldom or never perform this act, as the horse and the rabbit. The stomach of the infant, for example, receives the insertion of the œsophagus at its left extremity, and far removed from the pylorus; whilst, in the adult, the œsophageal termination is almost midway between the two extremities. This difference in structural configuration, in the opinion of Schultz, satisfactorily explains the phenomenon to which I have just referred.*

On the subject of digestion, its chemical changes, and the essential nature of that process, several very important facts have been discovered by Eberle, and confirmed, to a greater or less extent, by Müller and Dr. Schwann, of Berlin. From certain experiments performed, it is deduced that the chymifying fluid contains a peculiar principle, to which the term *pepsin* has been applied—this, though soluble in water, in diluted hydro-chloric and acetic acids, is destroyed by alcohol and infusion of galls, and it is further inferred that this principle is the solvent of all alimentary matters allied to animal albumen, but that it does not affect the solution of casein, animal jelly, starch, and gum, which is accomplished by the action of the free acids of the gastric juice.† The discovery, by Purkinje and Valentin,

* *Hufeland and Osann's Journal der practischen Heilkunde, Merz,* 1835.—Also *British and Foreign Medical Review,* October, 1836.

† *Müller's Archiv. für Anatomie und Physiologie, Jahrgang,* 1836.—*Hefts i and ii.*

of the existence of ciliary motions in reptiles, and also in certain warm-blooded animals, has been confirmed by Dr. Sharpey, of London, who has published some additional experiments, which suggest an explanation of the manner in which nature effects the transit of the ovulum to the uterus.* The views of Professor Alison, regarding a self-moving power in the blood acquired during its re-integration in the lungs, have recently received further support from the researches of Dr. Hawley, of Edinburgh.†

Amongst the investigations into the physiology of the nervous system, it is proper to notice certain experiments and observations that have been made with a view to determine the independent character of the nerves of taste. So far as I am aware, one of our associates, Mr. Noble, of Manchester, has the merit of having first published, in a number of the *London Medical Gazette*, for 1834, a case of facial paralysis manifesting loss of feeling on the left half of the tongue, with a perfect maintenance of the sense of taste; from this coincidence, he inferred that taste is as independent of ordinary tactile sensibility, as are the senses of sight, hearing, and smell, and must, like them, possess a separate nervous apparatus. No specific functions having been assigned to the chorda tympani and the palatine branches of Meckel's ganglion, Mr. Noble suggested that, as these were distributed to the surfaces where the sense of taste resides, future observations might determine that they were specially associated with this sense. This inquiry has since engaged the

* *British and Foreign Quarterly Medical Review*, April, 1837.

† *Edinburgh Medical and Surgical Journal*, October, 1836.

attention of Panizza, Mayo, and Dr. Alcock, of Dublin; but as the results of their experiments, performed by mutilation of living animals, have presented no uniformity, the question may still be regarded as unsettled. I think, however, it will generally be considered as a fact now established, by pathological observation, that separate filaments endow the tongue with tactile and gustatory sensibility; but the source of the filaments, on which the sense of taste depends, yet remains an interesting matter of investigation. Another point in the physiology of the nervous system which has recently excited some interest is the very ingenious explanation, first offered by Mr. Hunt, another of our associates, relative to the complex distribution of the orbitar nerves to the muscles of the eyeball; this subject having frequently occupied the attention of physiologists without any very satisfactory result. Mr. Hunt was led to consider that the *obliquus superior*, rolling the eye outwards and downwards, and the *rectus externus*, moving that organ directly outwards, do not receive their nervous supply from the same source as the other muscles, because as the branches of the third pair supply the *rectus superior, inferior*, and *internus*,—muscles which act in concert in both eyes, another source of nervous distribution must exist for the *obliquus superior* and *rectus externus*, inasmuch as by their action one eye is turned either directly or obliquely outwards, whilst the other is moved in an inward direction. These views, in detail, are ably explained by their author in the last volume of our *Transactions*.* In a

* Volume 5th.

paper, however, published in the *London Medical Gazette* for September last, a somewhat different explanation of the functions of the muscles of the eyeball and their nerves has been offered by Mr. Walker, of Manchester. This gentleman, in adopting the opinion of Meckel, Cloquet, Knox, and some others, that the *obliquus superior* turns the eye inwards, and not outwards, contends that the function of this muscle associates its action with that of the *rectus externus* of the opposite globe. In other respects, Mr. Walker's views essentially coincide with those of Mr. Hunt.

The subject of phrenology, regarded by its advocates as the physiology of the brain, has recently engaged the attention of the Academy of Medicine in Paris. The question had been proposed—how far phrenology is entitled to rank among the sciences? The discussion, it appears, occupied four sittings, when, after deliberate consideration of the arguments adduced on all sides, the Academy deferred any decision until the evidence upon which the system rests should be rendered more complete.

Medical pathology and therapeutics have, for some years, been investigated with more than ordinary zeal and assiduity; and, in reviewing the recent labours bestowed upon these branches, we observe that several interesting subjects have received further elucidation. Fever, complicated with disordered condition of the intestinal mucous membrane, continues to engross much of the attention of foreign physicians, and has given rise to a considerable number of essays and reports. Amongst the principal of these, I would particularly mention some

remarks by Dr. Frenzel, who has published in *Hufeland's Journal** an able description of the disease as it occurred in the Military Hospital of Dresden; and an interesting delineation of it by Dr. Killiches, as observed at the town of Brux, in Bohemia;† as also an excellent account of the morbid anatomy of this affection, from the Fredericstadt Infirmary, by Dr. Stannius, of Berlin,‡ and an elaborate paper, upon this form of fever, by the regimental surgeon Grossheim, as it appeared in the summer of 1835, in the Imperial Grenadier Guards.§ These, and other valuable contributions which have recently been published, afford an ample confirmation of the results obtained by the French pathologists, relative to the frequent association of abdominal ulceration with the typhoid condition in fever. Before leaving the present subject, I must not omit to speak of the discovery, by Professor Schonlein, of Zurich, of minute microscopical crystals in the fæcal matter of patients labouring under typhus fever. These were transparent and fragile, and consisted chiefly of sulphate of lime, phosphate of lime, and soda. They were generally rhombic, or prismatic, and were not detected in the discharges accompanying the ordinary forms of diarrhœa, even that occurring in the latter stage of tubercular phthisis.‖ Müller, of Berlin, to whom the account of Professor Schon-

* *lxxx. Band*, 1835. 1 *St.*

† *Medicinische Iahrbücher, des k. k. Österr. Staates; xviij. vol. Wien*, 1835.

‡ *Hufeland and Osann's Journal der Practischen Heilkunde*, 1835. *February, March, and April.*

§ *Ibid. lxxij. Band* 1836. *iv. St. April.*

‖ *Müller's Archiv*, 1836. *Hefts iii. and iv.*

lein was addressed, found crystals, however, in the excrementitious matter of subjects brought for dissection; and, in these instances, it was ascertained that death had not ensued from typhoid fever.

A peculiar disease affecting young children, usually designated *laryngismus stridulus*, or the crowing inspiration of infants, and sometimes *spasmodic croup*, has lately received a considerable degree of attention, more especially from Dr. George Hirsch, of Konigsberg,* and Dr. Rösch, of Sweningen, in Wirtemberg.† It will generally be known that the affection, upon which the late Dr. Hugh Ley published a useful and valuable treatise, had some years previously engaged the notice of Dr. Kopp, who, in 1830, read a paper upon this subject at Heidelberg, wherein he referred the origin of this ailment to an enlargement of the thymus gland. This doctrine of the origin of spasmodic croup has been confirmed and illustrated by Dr. Hirsch, who has adduced various cases and dissections to shew that the disease occurs in early infancy when the thymus gland is fully developed, in these examples retaining its large size beyond the ordinary period, with morbid alteration of structure. Against this theory, Dr. Rösch reasons very strongly, and maintains that it is an affection altogether spasmodic and nervous, and not necessarily dependent upon any organic change, or undue magnitude, of the thymus gland, coinciding in these respects with the views of Dr. Hugh Ley and other English physicians. The employment of the sulphate of copper in this form of

* *Hufeland and Osann's Journal, Jul.*. 1835.

† *Ibid. lxxxii.* 1. *St. Januar. Seit.* 96, 1836.

infantile disease, as also in ordinary croup, has been proposed by several German practititioners; and the results have been well set forth in two excellent papers by Dr. Zimmerman, of Hamburgh,* and by Dr. Bürger, of Bamberg.†

In the treatment of another and a very intractable disease occurring in infants, the diarrhœa and vomiting which terminate in softening of the mucous membrane of the alimentary canal, Dr. E. F. Dürr, of Wirtemberg, has proposed the employment of pure alumina, in combination with mucilaginous remedies, and he affirms that the success of this mode of treatment has been most complete.‡

In the medical section at the Bristol meeting of the British Association for the Advancement of Science, Dr. Prichard read a paper of great practical value, in which he described a peculiar mode of exciting counter-irritation in certain forms of cerebral disease. This consists in making an incision through the scalp, down to the pericranium, in the direction of the sagittal suture from the summit of the forehead to the occiput, and the incision thus made is kept open by the introduction of one or two, and in some instances of three rows of peas. In illustration of this practice, Dr. Prichard detailed several cases of confirmed amaurosis which had been unsuccessfully combatted by the antiphlogistic and mercurial treatment, but from which a perfect recovery took place upon the establishment of suppuration by an issue of this description. I am happy

* *Hufeland's Journal*, 1835. *B.* 2 *Aug. ii. St.*

† *Ibid*, 1836. *Band lxxxii. April iv. St. Seite* 86-89.

‡ *Ibid*, 1835. *lxxxi. i. St. Jul. Seite* 98.

in being able to offer my own testimony in corroboration of the practical utility of Dr. Prichard's suggestion, having myself, in two instances of severe cerebral affection, indicated by mental imbecility, stupor, and imperfect vision, adopted the plan, after the failure of the ordinary modes of treatment, and with decided advantage.

A case of idiopathic tetanus, successfully treated by mercurial friction carried to the extent of producing salivation, has been recorded by M. Forget.* The extract of belladonna has been very extensively employed in the treatment of hooping cough, at the Hôpital des Enfans Malades.† M. Piorry has recommended, and himself adopted, a novel mode of treating circumscribed tuberculous excavations, more remarkable for its plausibility than for the soundness of the principle upon which it rests. He professes to have effected compression upon the ribs, in these cases, so as to have produced an obliteration of the cavities by adhesion of their sides.

The vegetable alkali, salicine, has formed the subject of a valuable monograph published at Potsdam, by Dr. A. P. Blom, which has since been translated into the German language. He ascribes to this substance, in the treatment of intermittent and remittent fevers, a virtue superior in many instances to that of quinia, or piperin, and records cases in which, these being contra-indicated, salicine proved a most efficacious substitute. In the

* *Bulletin General de Therapeutique Medicale et Chirurgicale, Oct.* 1836.

† *Gazette Medicale de Paris, Feb.* 1836.—The usual dose is from one-eighth to half a grain, repeated once or twice in the day.

bark of the roots of the apple, pear, cherry, and prune, M. de Koninck has detected a new principle named by him *phloridzin.* He says that it possesses properties analogous to those of quinia, and has been beneficially administered in ague when this latter has failed. It has also been recommended in leucorrhœa and gonorrhœa.*

In asphyxia, arising from inhalation of the vapour of oil, Dr. Krimer, of Aix-la-Chapelle, has successfully used the carburet of sulphur. The sulphuret of lime has been strongly recommended by Dr. Savardin, in cases of impetigo, porrigo, and various other cutaneous affections ; and he tells us that he has verified its curative powers in five hundred instances.†

Professional attention, after a lapse of some years, has been again solicited to the supposed therapeutical agency of mineral magnetism. Doctors Bulmeringg,‡ Wolf, and Becker,§ have been for some time past in the habit of employing it in various nervous affections, and the results which they have published would seem to afford evidence of its favourable operation under some circumstances. Creosote, amongst the more modern substances introduced into the materia medica, continues to excite the interest of the profession. It is stated

* *Annales de la Societè des sciences medicales et naturelles de Bruxelles.*— The dose is from ten to fifteen grains, given one hour before the accession of the paroxysm.

† *Journal des Connaissances Medico-chirurgicales,* 1836, *January. Tom. ii.*

‡ *Beiträge zur aerztlichen Behandlung mittelst des Mineralischen Magnetismus. Von Dr. M. E. Bulmeringg.*

§ *Hufeland und Osann's Journal. May,* 1835.

to have been tried by Dr. Köhler, of Warsaw, with favourable results in herpetic eruptions; and by others, in obstinate functional derangement of the stomach, as recommended by Dr. Elliotson. It has even been pronounced by Dr. Rampold, Physician to the Hospital at Esslingen, to have cured pulmonary consumption. *Credat Judæus Apella!*

The presence of iodine in the cod-liver oil, a remedy which once enjoyed very high repute, especially in Lancashire, has lately been established by the chemical investigations of Hopfer de l'Orme, as had previously been suspected by Dr. Kopp, of Hanau. Hence, it is not improbable that the virtues of this oil, in a particular species of chronic rheumatism, may have some dependence upon the existence of iodine in its composition.

Scabies has been cured by the external application of green soap, as first advised by Dr. Cramer.* This remedy has since been very extensively used by Dr. Pfeufer, of Bamberg,† who reports that, in six hundred cases, its efficacy was amply confirmed. M. M. Dumeril and Roux have, in a report presented to the Academy of Sciences, spoken in terms of high commendation of M. Legrande's new method of treating scrofula, with the salts of gold.

Several pathological facts, possessing both novelty and interest, have recently been recorded. Amongst others, a case has been published by Delle Chiaje,

* *Kleine Beiträge zur Medizinischen Erfahrung; Mitgetheilt von Dr. Cramer, Nr. xlii. Wochenschrift für die Gesammte Heilkunde,* 1837.

† *Beobachtungen über die Krätze und ihre Behandlung durch die Schmier-oder-grüne Salbe von Dr. Ch. Pfeufer zu Bamberg. Daselbst,* 1833.

as witnessed by the late Professor Folinea, of Naples, in which certain Entozoa, called *Polystoma sanguicola,* were discovered in the blood discharged by a patient attacked with hæmoptysis. The explanation of this phenomenon, offered by Delle Chiaje, is, that they originate in the parenchymatous structure of the lungs, and, perforating the parietes of the pulmonary vessels, are afterwards ejected. Thielmann, of St. Petersburgh, has related a necroscopical observation, in which was found a supernumerary kidney, situated on the right side of the fifth lumbar vertebra.* A diagnostic symptom, indicative of extensive peritoneal adhesions, has been announced by Dr. Bright. This consists in a peculiar impression, somewhat analogous to crepitation, communicated to the touch, in the exploration of the abdomen in these cases.† Dr. Albers, of Bonn, has described a remarkable affection of the thoracic duct, wherein its parietes were dilated after the manner of the arterial structure in aneurism.‡ Some interesting results have lately been obtained in the chemical investigation of the fluids, in certain morbid conditions of the system. In patients labouring under diabetes, sugar has been detected in the blood by Signor Ambrosioni,§ and more recently by Mr. Maitland.‖ The urine, in this

* *Journal der Chirurgie, und Augen-Heilkunde; Encyclographie Des Sciences Medicales. Decembre,* 1836.

† *London Medico-Chirurgical Transactions.* Vol. xix., p. 176.

‡ *Hannöversche Annalen, B. ii., H.* 1., 1836. Also, *British and Foreign Medical Review.* October, 1836. No. 10.

§ *Omodei, Annali Universali di Medicina. April,* 1835.

‖ See also *Medical Gazette.* No. for March, 1836.

same disease, has been found, in the analysis of M. Lehmann, to contain hippuric acid.*

Amongst other new discoveries that have been made known to the profession, within a very recent period, the method of preserving dead bodies practised by Dr. Tranchini, of Palermo, holds an important rank.† The plan consists, in passing through the carotid artery an injection composed of two pounds of arsenic, and twenty or twenty-four pounds of water or spirit of wine coloured with cinnabar; whereby the vascular system becomes thoroughly saturated with this solution. In cases where putrefaction has advanced in some degree, the same fluid is introduced by means of a trocar into the cavity of the abdomen. I have the testimony derived from personal observation of our intelligent associate Dr. Knight, of Sheffield, in proof of the complete efficacy of this process.

I must not here omit to make mention of one of the most extraordinary announcements, in connection with this subject, that have ever attracted the attention of our profession. I refer to the discovery by Signor Segato, of the artificial conversion of animals, or fractions of animals, into a state of stony induration and indestructibility, whilst at the same time they retain their natural form, and colour, and by a modification of the process, their very flexibility. This most marvellous statement has been made by Signor Pelligrini, in a pamphlet published at Padua, which contains full particulars of the wonderful efficacy of Segato's process, and affords

* *Journal für praktische chemie. Vol.* 6, *Cah.* 3, *p.* 113.

† *British and Foreign Medical Review.* October, 1836.

also the testimony of four Florentine professors in attestation of the verity of the discovery.*

In the strict domain of surgery, I have scarcely met with a new fact which has escaped the industry and research of my learned and able predecessor, Mr. Crosse, who, in his powerful address of last year, traced, with no common zeal and assiduity, almost all the improvements in this branch of our art up to the latest period. However, I may allude to one or two contributions, of modern date, which indicate a continued advancement in this division of the profession. M. Ricord has afforded a report of the great success attending the employment of mercurial ointment, in the treatment of erysipelas, and the utility of this practice has also been established by the experience of M. M. Lisfranc and Broussais † Numerous examples have been adduced by M. Renaud in proof of the value of raw cotton in the same affection. In his hands, it appears to have subdued the pain, heat, and other marks of inflammation, in a very surprising manner. He simply applies soft well-carded cotton in sufficient quantity to protect the erysipelatous parts from exposure to light and air.‡ The nitrate of silver, both in substance and in strong solution, has been employed by M. Ricord, in the blenorrhagia of females,—a mode of treatment that has also been adopted by some practitioners in this country. Mr. Liston, of

* *Della artificiale riduzione a Soliditá Lapidea e Inalterabilitá Degli Animali, Scoperta Da Girolamo Segato Relazione Dell' Avocato Giuseppe Pelligrini. Firenze,* 1835.

† *Gazette des Hopitaux,* 1836.

‡ *Journal des Connaissances Medico-Chirurgicales. February,* 1836.

London, has successfully performed a new operation for nævus, by passing a needle, armed with a double ligature through the base of the tumour, and another, in like manner, at right angles with the former; and, the needles being withdrawn, he compresses the tumor by tying the ligatures.*

The department of obstetrics has presented but few additions to our knowledge, and but few facts of striking interest, within the actual period of the present retrospect. In the branch of operative midwifery, however, I observe it related in *Hufeland's* excellent *Journal*,† that Valentin Newber, of Molsdoff, has on two occasions, during the past year, performed the Cesarean section. In the one instance, the life of the mother was saved, though that of the child was lost; and in the other, the reverse occurred, for the life of the child was preserved, whilst that of the mother was unexpectedly sacrificed. In the former case, the woman was thirty-seven years of age, and the straight diameter of the pelvic outlet was only about an inch and a half. The child's movements had not been experienced for three weeks prior to the operation, and before its performance the female had been in labour during thirty-six hours. In the second case, the section was made upon a woman aged thirty-two years, and about a week after the operation she was seized with an attack of peritonitis, which terminated fatally. A somewhat novel and curious case has been announced by Sommer, in one of the Prussian Journals wherein a living child was extracted by

* *Lancet*. Dec. 21, 1836.

† November 1836.

turning a quarter of an hour after the death of the mother, and twenty-four hours after the rupture of the membranes.* The question of superfœtation is one which continues to divide the opinions of physiologists. A fact, however, has been recorded by Mœbus, strengthening the evidence in favour of the possibility of this occurrence. A female, aged thirty-five years, was delivered of a full grown child thirty-three days after the previous expulsion of a mature fœtus and placenta.

Whilst engaged in the review of matters connected with midwifery, I will take the opportunity of narrating a somewhat remarkable phenomenon that has recently occurred in my own immediate neighbourhood. The wife of a labouring man, residing in Stalybridge, near Manchester, gave birth, in the latter end of May of the present year, to a monstrosity, apparently the result of an abortive effort of nature to effect the formation of twins. This *lusus naturæ,* having only one head, is possessed of four arms and four legs; the sex is masculine, and the organs of generation are double; with several other analogous peculiarities, which, however, will be better understood from a drawing than from any mere verbal description. I have accordingly provided myself with one for the inspection of the members of the Association. It will be interesting to know that this singular being is still living, and in the seeming enjoyment of excellent health.†

Amongst the many useful designs embraced by

* *Kleinert's Repertorium.*

† See drawing at the beginning of the work.

this Association, it is a wise regulation that investigations into the nature of epidemic diseases should constitute one of its principal objects; and our Central Council have most judiciously instituted certain inquiries relative to the main features of that formidable epidemic, the influenza, which prevailed so extensively, in various parts of Europe, about the close of the last year and the commencement of the present. It is hoped that, by this proceeding, such an accumulation of facts may be obtained, as will tend to throw additional light upon the etiology and pathology of this affection. In this country, the influenza first made its appearance in the northern parts of Scotland in the month of November, and was rife in Edinburgh about the middle of December; it gradually increased until the second week in January, when it prevailed almost like a pestilence during the whole of that month. About the same time it invaded the metropolis and most of the large towns throughout England. The particular characters of this malady were strongly and distinctly marked. In most instances, it was ushered in with an overwhelming sense of languor and debility, accompanied with head-ache, pain in the limbs, and the other indications of general febrile disturbance. With this constitutional condition were associated, in all instances, catarrhal symptoms, varying in intensity, according to the other peculiarities of the individual case. In ordinary attacks, the affection subsided under the combined influence of rest, mild aperients, diaphoretics, and diluents, in the course of a few days. But in many persons, advanced in life, or previously enfeebled by bron-

chitis, or other chronic disease, the debility became so extreme as to render the patient unable to cough or to expectorate; a low, insidious inflammation was established in the vesicular and parenchymatous structures of the lungs; rapid and laborious respiration ensued, and the patient ultimately expired with all the marks of general exhaustion. In other instances, where the disease was neglected or improperly treated, or where a premature exposure to cold occurred, violent and active pulmonary inflammation was induced, and it proved equally unmanageable and fatal. It is remarkable that, in some cases, the affection seemed to pervade, to a considerable extent, the mucous membrane of the alimentary canal, as manifested by profuse watery, or sero-sanguineous diarrhœa, with violent tormina and tenesmus. In this form of the attack, all remedies were ineffectual, until warmth and moisture became freely developed upon the skin, and until the alvine evacuations began to assume a feculent character. For the promotion of these objects, rest, bland and diluent drinks, with occasional doses of Dover's powder and the hydrargyrum cum cretâ, were most generally effectual. Owing to the enfeebling influence of this epidemic, it frequently became requisite, more especially with the aged and the infirm, to administer, at short intervals, wine or brandy, in moderate quantities; and, by this proceeding, recovery, even in such subjects, was sometimes effected. Yet, in other cases, the disease became exceedingly tedious and complicated, requiring a very cautious method of treatment, which combined the employment of tonics,

diaphoretics, and expectorants. In some habits, the cough and general debility were protracted for many weeks, and the remedial means, found to be of the greatest utility, were constant attention to diet, the due regulation of the bowels, the use of anodynes to allay the cough, and the judicious exhibition of tonic medicines. The morbid appearances chiefly observed upon dissection, were consolidation of the substance of the lungs, with engorgement of the bronchial tubes, by a frothy, or muco-purulent secretion; and, generally, there existed, also, an emphysematous condition of the pulmonary vesicles.

In the course of the last year, that destructive and pestilential affection, the malignant cholera, committed its fatal ravages in Vienna. In the early part of the month of June, 1836, the popular sickness assumed the form of gastro-duodenic fever, with bilious diarrhœa, and it was attended with unusual diminution of muscular energy. About the same time, cases of cholera were observed, not, indeed, numerous, but of so intense a character as to destroy life in a few hours. These progressively increased in frequency, with the gradual disappearance of the bilious epidemic, until the 25th of the same month, when it began to rage with all the severity which has so generally marked its disastrous career. The last days of June proved a mournful period to the citizens of Vienna, for about this time there were upwards of seven hundred persons afflicted with cholera, and of this number more than one half fell victims to its awful virulence.

It is truly a subject of humble acknowledgement

to the Author of all good, that we, in this country, have of late been almost entirely spared from the return of this dreadful visitation; yet I feel assured that, should it please Providence to afflict the people of this kingdom with a recurrence, the members of our profession will again be found ready to endanger their health and safety in the disinterested and benevolent discharge of those perilous duties which, on former occasions, so eminently entitled them to the gratitude and admiration of their countrymen.

It deserves to be regarded as an indication of the advancing movements of medical science, that the value and importance of medico-statistical researches are gradually attracting the attention of the profession, in a degree more proportionate to their merits. Until within a very few years, scientific men diligently, but too exclusively, pursued the beaten track of investigation adopted by their predecessors, and neglected the advantages offered to them in the department of medical statistics. To the labours of M. M. Berard, Villermé, Quetelet, Benoiston de Chateau-Neuf, Guerry, Louis, Lombard, Casper, Parent-Duchatelet, Hawkins, Rickman, Forbes, Thackrah, and one or two others, the profession is not less indebted for the results derived from their particular investigations, than for their practical illustration of the utility of statistical inquiries.

In this country the materials for preparing statistical tables are, in a great measure, yet to be collected; for it is a circumstance deeply to be regretted, that the records of most of our public

medical charities contain few or no particulars respecting the cases brought under treatment, from which accurate medico-statistical calculations can be formed. The time has, however, arrived for the introduction of a more exact method of research, calculated to facilitate medical investigation, and more adapted to the enlightened spirit of philosophical enquiry which characterizes the present age.

Of the beneficial results which may ultimately accrue to medical science from the more general adoption of statistical investigations, when prosecuted with care and a due attention to accuracy of notation, and minuteness of detail, it would be difficult, in the present infancy of this branch of inquiry, to form any proper estimate. Some time must necessarily elapse, before these advantages can be obtained; and the conclusions afforded by statistical investigations will require to be received with caution until such an amount of facts has been accumulated as will justify general deductions; for it must be borne in mind, that these inquiries, when applied to the development or confirmation of philosophical principles, are valuable according to the accuracy with which they are conducted, and to the nature and extent of information they supply, on the several subjects to which they are directed.

Statistical science essentially embraces the numerical arrangement of facts, holding no connexion with speculation or hypothesis; hence, every statement, resting merely on conjecture and supposition, ought to be most carefully excluded from statistical tables.

The recent publication of Parent-Duchatelet on

the *Statistics of Prostitution in the City of Paris,* offers an admirable illustration of the satisfactory nature of the data obtained from this method of research. Indeed, the work embodies such an immense accumulation of interesting and important facts, considered either in their physiological, hygienic, or moral relations, as to demand from me somewhat more than a casual notice. The author, with great industry and perseverance, seems to have made the collection of information on this subject his chief occupation for a period of eight years. In his preface, Duchatelet explains the motives which induced him to commence the undertaking, and the results that may be expected to flow from the investigation; and these have an especial reference to the repression of immorality, to the public sanity, and to improvements in the administrative department exercising jurisdiction over the prostitutes of Paris. The author, unlike most of his predecessors who have written upon such subjects, takes nothing for granted, makes no general assertions, nor speaks from mere vague impressions; but he pursues, throughout, a *systematic* inquiry, commencing with the probable number of these unfortunate individuals, the places of their nativity, the kind of families to which they belong, and their previous occupations and early education. In the course of the work, he also enters upon very many interesting physiological considerations regarding this class of persons, and upon the influence exerted by their peculiar mode of life upon their state of health. All the results of Duchatelet's inquiries are based upon the authority of state and police documents, or upon the evidence

of actual observers; and they are rendered still more precise and available from the use, in many instances, of numerical tables. There is one statement made by Duchatelet which, if confirmed, may possess considerable importance in a medico-legal point of view. It relates to the discovery of a new sign of pregnancy by M. Jacquemin, which consists in a violet, or wine-lee colouration of the whole of the mucous membrane of the vagina during this particular period This sign is so evident, that Jacquemin has never been deceived by it, and he considers that it is alone sufficient, independently of other symptoms, to prove the existence of pregnancy. This state of the membrane was observed in an examination of not less than four thousand five hundred pregnant females. Altogether, this work, as contributing very essentially to the stock of useful information, capable of being directed to a variety of beneficial purposes, may, I think, be well classed among the most important that have appeared before the profession within the last year.

The medical literature, both of our own and other countries, has been also enriched by many other excellent contributions. Amongst works of high professional interest, there are several which merit particular notice. Bouillaud's *Essai sur la Philosophie Medicale* may be especially named. This publication professes to explain and to illustrate the true principles upon which medical science ought to rest, and by the application of which every real advancement must be effected, and medicine be brought to partake more of the character of the exact sciences. It is to be regretted that the author

exhibits himself, but too exclusively, a partizan of the school of Broussais; and thus, in some measure, detracts from the high character which his essay, in other respects, is calculated to maintain. The systematic work of Müller, upon the Principles of Physiology, claims a short notice upon the present occasion. Although the first edition of this work was published in 1833, yet as it has attained a second one, which only reached this country in the beginning of 1836, I think it right to refer to its appearance, as it may probably be considered the most complete and philosophical treatise upon this subject extant.* During the last year, a new volume on the Physiology of Man, by Tiedemann, has been published at Darmstadt. It includes the examination of the function of nutrition, in all its relations; and herein, the author has furnished the physician with one of the clearest and most comprehensive works upon the MATERIA ALIMENTARIA that have yet been submitted to the attention of the profession. A valuable characteristic of this publication is that, at the commencement of each section, chapter, and subdivision, a list is subjoined of the principal treatises, relating to each of the subjects discussed, and thus is afforded the key to their literary history.† There is at present emanating from the medical press, at Leipsic, an excellent Dictionary, by George Frederick Most, which embraces every

* *Handbuch der Physiologie des Menschen für Vorlesungen. Von Dr. Johannes Müller, Zweite verbesserte Auflage. Coblentz,* 1835.

† *Physiologie des Menschen. Von Friedrich Tiedemann, Dritter Band, Nahrungs-Bedürfniss, Nahrungs-Trieb und Nahrungs-Mittel des Menschen. Darmstadt,* 1836.

division of medical science. The first volume only has, as yet, appeared. The articles are generally written by authors whose names have been previously associated with their respective subjects, and they indicate the probability of its constituting, when complete, one of the most learned and useful works of the kind in existence.* The department of surgical pathology has recently received an extremely interesting contribution, in the anatomico-pathological treatise on the general anatomy and inflammatory diseases of bone, by Frederick Miescher, a pupil of the celebrated Müller. Mr. Solly, to whose anatomical investigations I have before had ocasion to refer, has furnished the student, within the last twelve months, with an excellent work on the anatomy of the human brain, remarkable for the concise and lucid illustrations which he has educed from a comparative view of the nervous system in the lower orders of animals. In this volume, Mr. Solly has also supplied a great desideratum, in having afforded, in a clear and elementary style, an exposition of the improved anatomy of the brain, as first taught and demonstrated by Gall and Spurzheim. Upon the practice of physic, three new publications have appeared within the past year, that are well calculated, from the high reputation of their authors, to attract general attention. Doctors Bright and Addison have issued the first part of a work upon the sub-

* *Encyclopäedie der Gesammten Medizinischen und Chirurgischen Praxis, mit Einschluss der Geburtshülfe, der Augenheilkunde und der operativen Chirurgie. Von Georg Freidrich Most. Erster Band, A. Humectantia-Leipzig,* 1836.

ject, comprising the consideration of fever, under all the points of view of which it is susceptible. The treatise is short, but from its perspicuity seems well adapted for initiating the student in the principles of medical practice. Another of the works, to which I have just alluded, is by Dr. Williams, which presents a somewhat peculiar character, inasmuch as the author adopts, as a leading principle, both in his pathological and therapeutical doctrines, the notion that all febrile affections depend upon the presence of some poisonous element. This work certainly affords some interesting descriptions of disease, but its utility, as a guide to the student, is diminished by the circumstance of his being introduced, at once, into the more obscure and abstruse departments of theoretical toxicology. Dr. Craigie has offered to the medical reader, within the last few months, the first volume of his work upon the Practice of Medicine, which, indeed, promises to be more comprehensive in its design and execution than either of the former publications. Dr. Stokes's new volume on the Diagnosis of Diseases of the Chest, must not be omitted in an enumeration of the new publications possessing great practical value. Our pathological literature has lately been enriched by the excellent work of Dr. Hodgkin, on the morbid anatomy of the mucous and serous membranes. It is well worthy the attentive perusal of all who are engaged in this particular branch of study. Mr. Swan continues his admirable delineations of the nervous system, and a second part of the illustrations of its comparative anatomy has appeared since our last meeting. The *Cyclopædia of Anatomy and Phy-*

siology, has reached its tenth part, and fully redeems the high promise guaranteed by the eminent list of its contributors. Upon the same plan, the first number of the *Cyclopædia of Practical Surgery*, edited by Mr. Costello, was published in the month of April, of the present year, and if its succeeding numbers correspond with the first in point of execution, it will constitute no unworthy associate of the *Cyclopædia of Practical Medicine*. The fourth part of the *Dictionary of Medicine*, by Dr. Copeland, after long anticipation, has been lately presented to the public, and, like the preceding portions of the same work, evinces the possession, on the part of its author, of extraordinary erudition, and talent for research, combined with scientific discrimination, and great soundness of professional judgment.

It will be almost universally allowed that medical science is, in many respects, greatly indebted, for the general diffusion of its improvements, to the circulation of well conducted periodical publications; and I have noticed, with much satisfaction, that two additions have been made to this class, within a recent period. One of these is under the editorship of Dr. Riofrey, and its professed object is to afford a conjoint and summary view of the actual state of both British and Continental medicine; the other is entitled the *British Annals of Medicine*, the first number of which was issued in January of the present year, and it seems to be conducted with considerable energy and ability.

Of all the collateral sciences, chemistry is, in its phenomena, one of the most varied and interesting;

and, in its application to medicine, it is highly important and extensive. It has not only given a systematic connection to isolated data, but has supplied a guiding rationale in the mutual action of medical ingredients. All the researches in physiology must be promoted, as well as most strikingly illustrated, by the light which chemistry has already afforded, and which it promises still further to afford. I lament that the multiplicity of topics, which I have been obliged to introduce into the present Address, renders it imperative that I should treat, very briefly, of recent chemical discoveries, and of the new laws which have of late been developed.

The recently detected acids are very numerous, the source of several of which is tartaric acid, acted upon by various agents. Of this *family* of acids, if I may so call them, may be mentioned the *racemic*, first obtained by the Germans from the grape, and differing from the tartaric in its containing two atoms of water. When this acid is subjected to an operation similar to that employed in the formation of pyro-tartaric acid, the *pyro-racemic acid* is obtained. An acid resulting from the mutual action of arsenic and alcohol has been discovered, and has been designated *arseno-vinic acid*. Several other acids, which it might be tedious to particularize, have also been for the first time detected. It is not improbable that, as in former instances in the history of chemistry, some of them will ultimately be found to be modifications of one another. That valuable order of chemical substances, the alkaloids, has received some additions. *Berberin* has been extracted from the *Berberis vulgaris*, or common

barberry; and *Oxyacanthin* has also been obtained from the same source. The common cowslip, or *Primula veris,* has yielded, under chemical manipulation, an alkaloid principle, to which the term *Primulin* has been applied. The neutral compounds are not remarkable, either for their number or importance. *Suberine* is the residue, after cork has been subjected to the successive action of water, alcohol, and ether. *Camphogene,* or *Dadyle,* is the product of the distillation of artificial camphor, mixed with hydrate of lime. *Hydro-benzamide* and *Baregin* also belong to the same class. From the nature of the ethers, and the mode by which they are generated, we might have expected a considerable variety, and such anticipation has been realized; thus, the *mucic,* the *napthalic,* the *suberic,* and the *hydro-sulphuric* ethers rank amongst recently discovered products. A new compound of iodine has been detected, by M. Aimé, which holds the same relation to this element, that chloral does to chlorine, and has hence been denominated *iodal.** An application of optics to chemistry has lately been made by the sagacious and indefatigable Biot. It depends upon the deviation of the polarized ray of light in various fluid media. As this phenomenon may hereafter be rendered subservient to purposes of practical utility, it is worthy of further investigation.†

The extraordinary results obtained by Mr. Crosse,

* *Comptes rendus hebdomadaires des séances de l' Academie des Sciences. Janvier,* 1837.

† The materials for the preceding brief sketch of the progress of chemical science have been freely appropriated, in as far as was thought proper, from the interesting annual of Dr. Robert Thomson.

in his electro-magnetic researches, have not yet been confirmed sufficiently to render it necessary for me to enter into any details on the subject. If his present expectations be realized, even to a very limited extent, they will certainly throw much light upon many points of natural science which yet remain in considerable obscurity.

Though I have been enabled to trace but briefly, and, I fear, but very imperfectly, the recent progress of chemistry, I must pause for a moment whilst I refer to the severe loss which this branch of science has sustained, in the decease of Dr. Henry, and Dr. Turner, two of its most zealous and distinguished cultivators. Dr. Henry was a native of Manchester, born on the 12th of December, 1774. His early predilection for scientific research was excited and fostered by his father, Mr. Thos. Henry, who had been long and successfully engaged in chemical investigations; and thus, at the earliest dawn of his powers of thought, he imbibed that philosophical spirit which, in after life, so eminently distinguished him. Upon the completion of his literary education, he became an inmate in the house of the late Dr. Percival, and, after a five years' residence with that accomplished scholar and physician, devoted chiefly to the general culture of his mind, and to the preliminary studies of his profession, he first engaged in the practical observation of disease in the Manchester Infirmary, where, in addition to the guidance of his more immediate preceptor, he also enjoyed the advantages derivable from the instructions of another eminent physician, the late Dr. Ferriar, and of one now present, our

late respected president, Dr. Holme. In the year 1795, Dr. Henry repaired to the University of Edinburgh, which then ranked amongst its teachers the celebrated Black, Gregory, Playfair, and Stewart; and, amongst its pupils, many of those eminent individuals who have since conferred such important advantages upon science, and thus reflected honour upon the genius and literature of their country. On leaving the University, Dr. Henry encountered, during five years, the fatigues and anxieties of general practice; but, owing to the delicate state of his health, he was compelled to relinquish this harrassing department of the profession, and returned to Edinburgh, receiving, in 1807, the diploma of "Doctor in Medicine." Whilst engaged, however, as a general practitioner, he contributed to the *Transactions of the Royal Society* several highly valuable papers, containing the results of his experimental researches in pneumatic chemistry, a division of science which always occupied a large share of his attention.

Dr. Henry, moreover, was not indifferent to the advancement of the profession to which he belonged, as is shewn by several interesting communications, on practical subjects, published in the medical journals of the day; by his important investigations, connected with the pathology of the urinary system; and by his more recent experiments relative to the disinfecting influence of high degrees of temperature on the matter of contagion. The general attainments of Dr Henry were also of a very high order, and though known to the world chiefly as a chemical philosopher, still it would be an injustice to his high

character, were he to be regarded only in that capacity. I would willingly dwell longer on the merits of Dr. Henry, for whose memory as a friend, I entertain sentiments of respect and esteem, and as a fellow-townsman a just pride and admiration, had not a memoir of his life and character been published by his son, in which are united the sacred feelings of filial piety, with scientific discrimination and refined taste.

Dr. Turner, Professor of Chemistry in the University College, London, died in the fortieth year of his age, on Sunday, the 12th of February of the present year. His scientific career, though terminated in early life, was eminently distinguished. His treatise on Chemistry is one of the most profound and valuable works which have been written on the subject, and it attained, very soon and deservedly, a degree of popularity which, for a publication of the kind, has been perhaps unprecedented. In successive editions, it is dedicated, in terms the most respectful and affectionate, to his revered and illustrious preceptor, Stromeyer of Gottingen, who was alike remarkable for his skill in analytical chemistry, and his power of imparting taste and precision to others. Owing, probably, to this circumstance, Dr. Turner ever manifested a decided predilection for this part of the science; and his papers on gaseous mixtures, and his elaborate researches on the compounds of manganese remain, with others, to shew his proficiency and success as an analyst. It may be mentioned as a melancholy coincidence, that the German Professor and his principal friend and rival in England, expired within a few months of each

other. Dr. Turner commenced, as a lecturer, by the delivery of private courses in Edinburgh, and he acquired so much celebrity, that, when the London University was established, he had no difficulty in obtaining the appointment to the chair of chemistry. His manner was characterized by clearness and simplicity. He had not only a perfect, but ready acquaintance with his subject; and, if he never dazzled by flights of imagination, he always allured by the stimulating interest which he took in promoting the progress of his pupils. In private intercourse, Dr. Turner was mild, affable, and courteous. His conversation was highly instructive, without the least pretension or display. He never attempted to raise himself by the depreciation of others; and thus, whilst he excited admiration by his intellectual worth, he inspired esteem by his personal qualities.

Amongst the distinguished physicians, and medical writers, who have been removed, by death, from the scene of their earthly labours, within the last twelve months, Hufeland of Berlin must not be passed over without my rendering a tribute to his memory upon the present occasion. Christophe Wilhelm Hufeland was born at Langensalza, in Thuringia, Upper Saxony, on the 12th of August, 1762. He was educated partly at the University of Jena, and partly at Leipsic, and took his degree of Doctor in Medicine and Surgery, at Gottingen, in the year 1783. He soon afterwards commenced practice at Weimar; and, early in his career, began to contribute to the leading medical periodicals of the day. An essay which he published about this time upon

the uncertainty of the signs of death, and upon the prevention of the distressing evils of premature interment, attracted much attention. It contained, moreover, a proposal to establish, at Weimar, a dead-house, for retaining the bodies of persons overtaken by violent or sudden death, until unequivocal symptoms of decomposition had ensued. This proposal was eventually carried into effect, not only in Weimar, but in many of the towns of Germany. In the year 1793, Hufeland removed to Jena, having received the appointment of Professor of Medicine in that University; and, two years afterwards, he commenced the publication of that celebrated Journal which has rendered his name so well known in almost every part of the civilized world. In 1801, he repaired to Berlin, having been chosen Physician to the King of Prussia, with the rank and title of Privy Councillor. He was afterwards elected Professor of Therapeutics and Clinical Medicine in the University of that city, and continued both to teach and to practise his profession, with the highest reputation and success, for upwards of thirty years. The last illness of Hufeland consisted in a return of an attack of retention of urine, under which he had suffered at a former period; and although the bladder was punctured above the pubis, still a fatal termination took place, on the 15th of August, 1836, from the occurrence of gangrene.

In addition to the great celebrity of Hufeland as a teacher, and as a journalist, his fame has been much enhanced by his writings, on various professional subjects; among which, may be especially mentioned, an excellent treatise on Nervous Fever

and its complications, as it appeared at Jena, in 1796, 97, and 98, also a work on Scrofula, and another on the Diseases of Children. His very excellent publication on the Art of prolonging Life, is very generally known, from its having received the honour of translation into several European languages.

In continuing the painful notice of the last year's obituary, the decease of one of the Vice-Presidents of this Association, Dr. John Johnstone, of Birmingham, claims our next attention, which melancholy event took place on the 28th of December, 1836. Dr. Johnstone was born at Kidderminster, in the year 1768, and after receiving the rudiments of a classical education at the Free Grammar School of that town, he entered Merton College, Oxford, where, in 1793, he took his degree of Bachelor of Medicine, having previously been engaged in the prosecution of his medical studies, also in London and in Edinburgh. He first commenced practice at Worcester, but in a short time removed to Birmingham ; and having, in the preceding year, taken his degree of Doctor of Medicine, he was, in 1801, elected Physician to the General Hospital of that town,—a field of usefulness, in which he indefatigably laboured for more than thirty years.

Dr. Johnstone was distinguished as an author, both in the medical and in the literary world. So early as the year 1795, he published an essay on Mineral Poisons, in which, as it was written forty year ago, we cannot expect to find the results of modern chemisty ; but though wanting in this respect, the accuracy with which the symptoms are

described, in this work, has never been surpassed in any later publication on toxicology. This essay, together with a most excellent one on Insanity which appeared in 1800, were originally intended to form part of a treatise on Medical Jurisprudence, which, however, was never completed. In 1803, Dr. Johnstone became a Fellow of the Royal College of Physicians, and, in 1813, was made a Fellow of the Royal Society. In 1819, he delivered the Harveian Oration at the College of Physicians, which is written in elegant Latin, and is alike creditable to the scholar and to the physician. Classical literature, indeed, was his favourite pursuit; and, hence, he was induced to undertake the Life of the celebrated Dr. Parr, which was published in 1828. In 1834, he had the honour of presiding at the Meeting of this Association, which was held at Birmingham, and the speech with which he opened the proceedings, together with the other occurrences of that day, would claim more than a passing notice; but, it is not necessary here to refer to circumstances which are commemorated in our *Transactions*, and which are doubtless fixed in the memory of all who were present on that interesting occasion. It was with deep concern that we remarked the indisposition under which he appeared to labour, at our meeting last year, in Manchester, from which time, I am informed, his health gradually declined, up to the period of his death. Dr. Johnstone was universally esteemed for the benevolence of his disposition, and for the uprightness of his character, as well as for the acuteness and vigour of his intellect; and this Association must deeply deplore the severe loss

which it has sustained by the decease of one, whose whole life presented an example of all that is amiable in the man, and accomplished and honourable in the physician.

It is with heartfelt regret that I now advert to the death of another of our associates, the late Mr. Ransome, of Manchester, who, it will be remembered, took an active part in the proceedings at our Anniversary Meeting of last year. Mr. Ransome died at the age of 58, having, in capacity of Surgeon to the Manchester Royal Infirmary, during the long period of thirty-one years, afforded the amplest evidence of his talents as a skilful and enlightened surgeon, and of his amiable qualities in the mild and humane treatment of his patients. He was one of the earliest teachers of anatomy and surgery in Manchester, and had been the Lecturer in the latter department of the profession, in the Pine Street Royal School of Medicine and Surgery, for nearly twelve years preceding his decease. It would far exceed the limits proper to be observed in this reference to the mortality of the last year, were I to offer a full tribute to the departed worth of one, with whom, as an hospital colleague, as a fellow teacher, and as a personal friend, I was, for many years, most intimately associated. In private life, Mr. Ransome's habits were eminently calculated to inspire confidence and esteem ; and the affability of his manners, and the kindness of his disposition, procured for him the affectionate esteem of all who had the happiness of his acquaintance.

The parliamentary inquiry regarding medical education, recently instituted, forcibly suggests the

propriety of offering some observations, on that important, though difficult and complicated subject. Although, as yet, no formal Report has been made by the Committee appointed for this purpose, still as the public are nevertheless in possession of much instructive evidence, furnished by many able and experienced witnesses, we are now better qualified to form a correct opinion, as to the present state of medical education, and as to the best means by which it may be improved, and be made to keep pace with the general progress of science, and the advancement and wants of society. Without involving this Association in the minute consideration of this varied and extensive subject, I must, however, direct its attention to some of the more interesting and important points connected with the investigation. All are agreed that a comprehensive education, literary, scientific, and professional, is essential to the physician. Many of the best and most experienced authorities, also, are satisfied that though the physician should confine himself, in practice, to the treatment of internal diseases, it is yet of the greatest consequence that he should be acquainted with the nature, origin, and tendency of the local affections, which come properly under the management of the surgeon. The boundaries between general and local diseases are often so imperfectly defined, and the influence of constitutional conditions upon the origin of local diseases is so obvious, that it is scarcely possible for the physician to be always a judicious or successful adviser, without the possession of this auxiliary knowledge. I am aware that the time has been when physicians

considered the acquisition of such knowledge to be, if not degrading, at least unnecessary; but we have now, I rejoice to say, abundant proof of the progress of a more enlightened and rational spirit. It is remarkable, that though the same principle must recommend to the surgeon the attentive study of the theory and practice of medicine, yet this is not so specifically required by the great surgical incorporation of this kingdom as its high importance would seem to demand, The great revolution which has occurred in the study and actual condition of surgery, within the last half century, is mainly to be attributed to the energies of one individual,—to the genius of the immortal Hunter. And what was the distinguishing feature and characteristic of the principles which that great man propounded? Why, that physiology and general pathology were the only sure foundations on which a rational surgery could rest. Since the days of Hunter the rectification and simplification of surgical practice has been continued and advanced by Abernethy, Cooper, Lawrence, Bell, Brodie, and others; and if we consider, attentively, the circumstances by which this improvement has been brought about, we find that it consists, almost entirely, in the application of the general principles of medicine to the theory and practice of surgery. Although the College of Surgeons have enlarged and improved their *curriculum* of education, by the addition of lectures on the practice of physic, and on materia medica, yet it would appear desirable that it should embrace, moreover, a separate course on physiology. To form a just idea of the importance of teaching phy-

siology, in a course distinct from that of anatomy, we may refer to the example of several of the most celebrated foreign medical schools, and also to that of Edinburgh, in which the institutions of medicine, embracing physiology and pathology, have, for many years, constituted the subject of a separate chair. Physiology may be regarded as the basis not only of the philosophy of medicine, but also of that of surgery. With mere anatomy, or an acquaintance with structure, medicine and surgery can never be successfully studied, for this only teaches the constitution of the organs of the human body, as so much dead matter, whilst physiology reveals their functions, and this latter knowledge can only be obtained by an observation of living phenomena; and hence it is obvious that, although the study of anatomy must precede that of physiology, this latter constitutes, essentially, a separate branch of inquiry. I appeal, with considerable satisfaction, to the example afforded by the London University College, in which Institution provision is made for the delivery of a complete course of lectures on physiology of six months' duration.

I have already adverted to the necessity of the surgeon's possessing an adequate acquaintance with the principles and practice of physic. As it is admitted, in the evidence given before the Parliamentary Committee, by some leading members of the College, that *medical* practice constitutes by far the largest proportion of the actual duties of all surgeons, even of those in London, it is most certainly a grievous defect, that whilst twelve months' attendance upon the surgical practice of a

recognized hospital is required, no provision is made for attendance upon the medical practice. There is also another department of study, unnoticed in the *curriculum* of the College, with which the well-informed surgeon is expected to be specially acquainted. I allude to the subject of medical jurisprudence; for he is often called upon to determine the comparative danger of various wounds, contusions, and similar injuries; and also to decide as to the question, whether in any given case of severe accident followed by a fatal result, that result has been the effect of violence, or has ensued from the existence of previous disease in one or more important organs. It is not enough to argue that a mere knowlege of anatomy, and the general principles of surgery, will enable him to perform this duty satisfactorily, for instances are almost of daily occurrence in which medical witnesses offer the most vague and inconclusive evidence, for want of that information which a previous systematic study of medical jurisprudence would be calculated to impart.

The education of the general practitioner, also, has recently been the subject of much discussion. It would be unjust to deny that the Society of Apothecaries have contributed, in no slight degree, to the improvement of the scientific character of this department of the profession. The regulations which they have issued, from time to time, have gradually advanced the medical education of those who would either have enjoyed no education at all, or have been satisfied with the smallest portion of information, requisite for the *practise* of the profession. The Society of Apothecaries are also entitled

to praise for exacting, from their candidates, certificates of attendance on courses of six months' duration upon anatomy, physiology, chemistry, and several of the other branches of science; and also for including, in their *curriculum*, lectures on forensic medicine. Inasmuch, however, as they do not require a separate course of lectures on physiology, their regulations are liable, in this respect, to the same objections as those of the College of Surgeons.

Before leaving the discussion of this question, I venture to offer a few suggestions, relative to the modes of education, best adapted for the three departments of the profession.

It is desirable, then, that every one destined to practise the medical profession, in any of its branches, should possess a liberal preliminary education, by which I mean a solid instruction in the history and literature of his own country, some knowledge of the mathematics, and an acquaintance with the French and Latin languages. To all, however, who are anxious to attain an eminent position in the profession, it is of some importance that the preliminary education should be more extended, and should embrace a knowledge of the German and Italian languages, in addition to the French, and an acquaintance with the Greek as well as with the Latin language. General information in some of the more prominent departments of natural history, and upon the elementary principles of physics, is also important to the aspirant for distinction in medicine.

Having thus noticed what, according to my own opinion, constitute the preliminary requisites of a

medical education, I now proceed to state, briefly, the views which occur to myself, regarding the course of study more strictly professional. I see no good reason why any very marked distinction should be made, during the first three or four years, in the education of the physician and the surgeon. An intimate acquaintance with general and descriptive anatomy, and physiology, with materia medica, chemistry, and pharmacy, is alike requisite to both, and may be acquired, for the most part, within the two first seasons. During the two succeeding years, the studies of each may be pursued by an attendance upon lectures on the principles and practice of medicine, and also of surgery, by lectures on midwifery and the diseases of women and children, and on medical jurisprudence, including medical police and hygiène. Within this period, it may be proper for the student to attend the lectures on physiology, separate from those on anatomy, an arrangement of some importance, upon which I have previously dwelt. At this time, also, instruction in general pathology, in clinical medicine and surgery, with an attendance upon the practice of a well-regulated hospital, is indispensable. Upon completion of the above course of study, it will become desirable to modify the subsequent education, in some degree, according to the destination of the individual to medicine or surgery. The physician should now direct his attention more exclusively to clinical medicine, and to the pathology of the internal organs; whilst the surgeon should, at the same time, devote himself chiefly to the study of surgical anatomy and surgical pathology, and to the acquire-

ment of skill and dexterity in the performance of operations, by repeated practice upon the dead body. Students, in general, derive but little immediate advantage from their earlier clinical attendance, and it is only after they have been for some time habituated to the pursuit, that they begin to understand its real importance, and to exercise that independence of thought, in personal investigation, which tends so materially to sharpen the observation, and to strengthen the judgment. To the physician, a competent knowledge of the nature, causes, and treatment of the various forms of insanity, is eminently requisite; and it is to be regretted, that the means of studying this branch of medical science, in our own country, are so limited, owing to the difficulty of procuring access to establishments for the treatment of this class of disorders. To the surgeon, the diseases of the eye, and of the ear, should form also an especial object of study.

It is highly desirable, in completing the physiological education of members of either division of the profession, that some attention should be bestowed upon comparative anatomy; and lectures seem to be the most ready mode of communicating, in a short time, general views upon this subject. As an accomplishment to both physician and surgeon, an acquaintance with the literary history of medical science is also indispensable. Courses of lectures upon this branch of information are regularly delivered in several of the Continental Universities; and some attention to this subject, by enlarging the sphere of thought, would lead the practitioner to form a more just estimate of the value of various

and conflicting doctrines, and methods of treatment.

And last of all, though not of the least importance, I am brought to speak of the professional education of that extensive and most useful body, the general practitioners. It is almost universally agreed, that the period of five years, for apprenticeship, as at present required by Act of Parliament, is too extended, and might certainly be reduced to the term of three years, with decided advantage both to the pupil and to the profession at large. For it must be allowed, that every beneficial result that can be expected to ensue from an apprenticeship at all, may be obtained within the last-mentioned period. After the termination of the apprenticeship, the student should commence his attendance upon lectures and hospital practice. Then, it would be well that he should bestow his principal attention upon anatomy, chemistry, materia medica, and botany, by a diligent attendance upon lectures on these branches, during the first year; and, during the second year, he might occupy himself with dissections, and begin to attend lectures upon the theory and practice of medicine, and of surgery, midwifery and the diseases of women and children, and medical jurisprudence. After being specially engaged for a period of two years in acquiring a competent knowledge of these various branches of medical science, the student should, during a third year, apply himself, with a somewhat exclusive assiduity, to the general practice of the hospital, and avail himself of the opportunities for clinical instruction which the Institution might afford. Though he should not allow himself to lose sight of any of

the information derived from his previous attendance upon lectures, he might yet relax, in some degree, in this mode of application, as an uninterrupted attention to the details of any of the collateral sciences might abstract his mind too much from what should then have become its principal object;—its adaptation to pursuits of a more practical character. During this third year, which might constitute the last of the *exacted* term, separate lectures on physiology and general pathology would be attended with the highest degree of advantage.

Before finishing these observations, it may be proper to offer just one remark regarding the duration of the courses of instruction, and the number of lectures delivered within a given time. According to my own view of the matter, three months form, in general, a period too limited for communicating full and satisfactory information upon the several branches of science of which practical medicine consists, and I anticipate that, under an improved system of education, due regard will be given to this subject.

As bearing, in many respects, upon this important topic of medical education, I am led to the consideration of the formation and consequences of the new Metropolitan University. No difference of opinion can exist as to the propriety of the capital of these kingdoms being the seat of an University, with power to grant degrees. The charter which establishes this University, conveys to the Chancellor, Vice-Chancellor, and other officers, the privilege of holding annual meetings for the purpose of examining candidates, and conferring on them various de-

grees, indicative of their literary, scientific, and professional attainments. It exacts that they admit to examination all persons possessed of the proper certificates from the London University College, from King's College, and from such other bodies, corporate or otherwise, as may hereafter, upon due consideration, be authorized to grant them; and, with a view to the accomplishment of this object, it requires the governing body to report, from time to time, to the Secretary of State for the Home Department, the names of such other institutions, for medical education, as it may be deemed right to include in the list of those from which candidates may be admitted to examination. In the execution of their functions, the Board, we have reason to conclude, will take cognizance only of uniformity in the course of education, and of adequacy in the attainments and qualifications of the candidate, without reference to the religious or political party to which he may happen to belong. This is a great and encouraging advance in the progress of a liberal and enlightened policy, with regard to the interests of our profession. It is to be hoped that the *curriculum* of the Metropolitan University, when issued, will not require a less amount of qualification than is demanded by that of the University of Edinburgh; and, under all circumstances, we may, I think, expect great good to result, both to the scientific character, and to the respectability of our profession, from the operation of this new establishment.

The continued prevalence of licentious empiricism presents a lamentable anomaly in the annals of civilization, and is strangely at variance with the

vaunted intelligence of the nineteenth century. Quackery has hitherto enjoyed almost undisturbed possession of the public mind, in some measure owing to an undue apprehension, on the part of medical men, of being suspected of interested motives in any attempt to unmask its evils, or to expose its baleful influence upon the well-being of the community. Among the most fertile causes of the success of this system of tampering with the lives and the health of its miserable dupes, may chiefly be included the deplorable ignorance, even of persons of education, with respect to the structure and functions of the human body, and all that relates to health and disease; for, in the language of the *Foreign Quarterly Review,* the popular idea of medicine would appear to be "that it is an art, a craft, a kind of *knack,* which some people are born with, or attain without study, and by the mere felicity of nature." And, assuredly, if we may judge from daily experience, charlatanism would seem to receive an amount of public patronage in proportion to the boldness and impudence with which it is associated. Perhaps it may not be difficult to account for the encouragement which it receives from the rich and luxurious. In proportion as they enjoy, and frequently abuse, to the detriment of their health and comfort, the good things of this life, they feel unwilling to part from them; and, thus, readily yield to the pretensions and effrontery of some plausible and interested quack. They willingly join in offering incense on the altar of that idol which they wish to regard as endowed with powers of healing superior to those of the well edu-

cated members of the profession. In short, they deceive themselves, and *are willing* to be deceived. It is a most humiliating circumstance, that, in this enlightened country, quackery is openly protected by the Government, whilst in almost all the other states in Europe, it is prohibited, under severe penalties; for, as is stated by the able author of a recent pamphlet, "On the danger, irrationality, and injustice of Quackery," more than a hundred thousand pounds is annually paid to the revenue of the country, for circulating the deadly nostrums of the empiric, under the sanction of a Government stamp; besides a large amount, received for the duty on advertisements.

It would appear as though there were different grades in the ranks of quackery, varying from the rude and vulgar empiric to the crafty and subtle pretender, who, wearing the outward badge of an honourable profession, has a soul so base as to sacrifice its most sacred interests at the shrine of his low-minded cupidity. Unfortunately, too, the names of some of the leading members of our profession have been circulated, in almost every newspaper in the United Kingdom, in testimony of the superior efficacy of certain remedies, professedly secret, and, therefore, undeserving of honourable sanction. I am more especially induced to allude to the subject, on this occasion, because I think it important that an Association, like the present, should affix its seal of reprobation, not only upon the direct encouragement of empiricism itself, but also upon every countenance bestowed upon it, from whatever quarter it may proceed.

Notwithstanding the apprehension which I entertain of having already trespassed, too long, upon the time and attention of the present assemblage, yet I feel reluctant to close this Address, without an expression of my respect and admiration for the ardent zeal, unwearied industry, and conspicuous talent which have been displayed by so many of our professional brethren, in the cultivation and enlargement of almost every branch of the healing art. Ours is an eminently useful, noble, and (to borrow the sentiment of the great Roman orator and moralist) *a God-like* profession; are we not then bound, by every sense of duty and honour, individually and collectively, to employ our utmost efforts to extend its utility, and to secure its respectability? And, most assuredly, no means are better adapted for the promotion of these laudable purposes, than the association of the dispersed members, and different ranks of the profession, in one body like our own Institution. A spirit of honourable and generous rivalry is in this way excited, leading to exertions for the extension of practical information and scientific research. Personal interviews, whilst they favour mutual instruction, encourage, also, kindly and social feeling, and thus exercise a powerful influence in checking those animosities and unworthy jealousies, which, arising in too many instances from the clashing of interests, not only disturb the harmonious relations of the profession, but injure its character in the public estimation.

It is, indeed, true, that some able, modest, and meritorious practitioners may naturally feel indig-

nant, if not envious, in witnessing the comparatively greater success of their less qualified, and, in every sense, less worthy competitors; since we but too often observe, that servility of manner, and the confident assumption of superior skill triumph, for a time, over real and unassuming merit. But let not the former be discouraged, for time and perseverance, and, above all, the estimation and countenance of the talented and liberal members of the profession will be sure, eventually, to place them in their just rank, and secure to them a due degree of popular favour.

In conlusion, I beg most cordially to congratulate this Association, and more especially its enlightened, zealous, and distinguished founder, upon the success which continues to attend its various exertions, in promoting the advancement of professional science, and in contributing to the maintenance of high and honourable feeling amongst its numerous members. I am assured, that our present position is so satisfactory, that nothing is required to secure the permanence and to extend the utility of our Association, but a steady perseverance in the noble work in which we are all engaged.

> *"Hoc opus, hoc studium parvi properemus et ampli,*
> *Si patriæ volumus, si nobis vivere cari."*

ARTICLE II.

INTRODUCTORY OBSERVATIONS

TO A

PROPOSED PLAN

FOR THE

REPORTS OF INFIRMARIES AND DISPENSARIES.

BY C. COWAN, M. D.*

At a meeting of the Association, held in Cheltenham, July 21st, 1837, a Committee, consisting of the following members,—Dr. Black of Bolton, Dr. Bompass of Bristol, Dr. Streeten of Worcester, Dr. Feild of Worcester, Mr. Ceeley of Aylesbury, Mr. Soden of Bath, Dr. Lyon of Manchester, and Dr. Cowan of Reading, was appointed for the purpose of deciding on the method best adapted for promoting the more general reporting of observations by the medical officers of Hospitals and other public Institutions, and for arranging the means most available for securing valuable statistical information.

It being thought desirable by Dr. Hastings that

* The Council of the Association are desirous of recommending the observations of Dr. Cowan to the attentive consideration of the members, and earnestly hope that every assistance will be afforded, both by advice in the maturing of the plan, and subsequently in carrying it into effect.

the subject should, as early as possible, be submitted to the consideration of the members of the Association, and sufficient time not having elapsed for establishing any effective communication with the members of the Committee, Dr. Cowan, as Secretary, and in compliance with the wishes of Dr. Hastings, has ventured to direct the attention of the Association to what all must admit to be a very important subject, and also to propose certain formulæ, for the purpose of eliciting the opinions and assistance, not only of those to whom the task has been more particularly assigned, but of all who will kindly forward the labours of the Committee, either by their advice or experience.

It is truly remarked by a recent and able writer, "that of all branches of knowledge, perhaps medicine stands more in need than any other of that aid which is to be derived from the attention of a great number of observers being directed to the careful collection of facts, on a large scale, from which, on the true principles of inductive philosophy, correct conclusions can alone be established." With equal truth the same individual adds, "that the duties and the cares of life prevent many from paying their mite into the treasury of knowledge, unless arrangements are made for inviting the industry and facilitating the labours of medical observers."

The facts that 90,000 cases are annually admitted into the British Hospitals, 6,300 of which terminate fatally, and that the Dispensary and out-patients amount to at least four times that number, are more than sufficient to prove the value and extent of the materials we possess, and to excite our

regret that hitherto they have yielded such comparatively disproportionate benefit. The cause of such a result can surely not be fairly attributed to the absence of zeal or intelligence in the medical attendants; but rather to the want of method,—to the absence of any settled and uniform plan by which both time and labour might be diminished, the records of experience more easily analysed; and facts more generally collected and compared. It is the testimony of many distinguished members of the profession, that from no general mode of reporting having been devised or recommended which all may adopt, the great majority of their experience perishes with themselves, and the valuable materials of a long and active life are for ever lost to their successors, and to the mind of the observer himself have been much less productive of practical results, than might and would have been the case under other and more favourable circumstances.

So serious an evil may be regarded as a natural though not a necessary consequence of the absence of any organised plan, by which the arduous duty of recording individual observations might be facilitated, and however incomplete the information we may reasonably expect to procure from even the best arranged method of reporting, yet no one can doubt but that some important conclusions would be obtained, and that more or less increase to our present knowledge would ultimately result.

We may now briefly advert to a few of the advantages attending the adoption of a uniform and well organised plan, for the purposes we have been considering.

In the first place, we insure the enumeration of a certain number of details, such as age, sex, occupation, residence, &c., arranged in a similar manner and easily transferred to tables framed for accumulating individual instances.

Every observation being recorded upon a similar plan, the labours of the same or of different individuals may be collated and contrasted, and general conclusions deduced; while the medical observer himself will be encouraged to persevere, not only by the saving of trouble to which settled forms conduce, but from the conviction that the facts he may accumulate are left in a state to become available either to himself or others.

The labour of analysing observations which have been irregularly taken, is immense, and most discouraging, even to the collector, while it is prohibitory to the efforts of others; and the greatest of modern observers, M. Louis, when inspecting his materials for his work on the "Affection Typhoïde," was compelled to devote three whole months to re-writing his own reports, for the purpose of arranging them on some uniform plan, by which their comparison became possible. Now it is evident that his labour might have been avoided, or materially lessened, had a correct method of reporting been originally laid down.

We are quite aware that the worth of observations depends upon the qualities of the observer, rather than on the particular method of reporting which any individual may select; but under all circumstances, some valuable details may be obtained from the least qualified, and rendered capable of general

utility, while the value of all observations is immeasurably increased by their being arranged upon some uniformly received plan.*

Another advantage arises from the attention of medical men being more strongly directed to the subject, and from the utility of numerous observations being more clearly perceived. A habit of observing would be fostered, and increasing facility in the process be acquired; new interest would soon be felt in the daily watching of the progress of disease, and in determining the effects of remedies; while those entering their profession, would be at once initiated into habits of thought and application, and early familiarised with the means by which the fruits of their future labours might be most effectually secured, either for their own benefit or that of others. Medicine would thus be gradually accumulating materials, from which a certain amount of truth must sooner or later be elicited, and each observer might regard himself as one of the contributors. If persons were expressly appointed for collecting the scattered information, and arranging it in a tabular form, much benefit might be expected to result; individual labours would be constantly converging, and we should securely lay the foundation of our future progress, by defining the extent of knowledge already in our possession.

For our present purpose, two forms of tables

* M. Chaponiere in his inaugural thesis at Paris, 1832, on "Facial Neuralgia," spent several months in collecting all the observations he could find in the extensive library of the school, and from other sources; but of 653 recorded cases, he was obliged to reject 400, in consequence of the irregular and incomplete manner in which they were reported.

appear more immediately necessary; one for the daily record of cases, the other for procuring some of the more important statistical details

There is no doubt that useful secondary formula might be desired, for facilitating and pointing out the method of generalising many of the details contained in the tables already referred to, as well as for obtaining other information, which these are not intended to include; as, for instance, the mean number of annual patients admitted, cured, relieved, dead, &c.; the average duration of treatment; the mortality or other peculiarities attending different ages; and other facts to which we need not now refer. We are not, however, prepared to propose any thing definite, but merely wish that these suggestions should not wholly escape the attention of the Association.

It is also probable that for the analysis of numerous cases, in reference to their symptomatology, pathology, and therapeutics, much labour might be saved, and great advantage gained, by well constructed tables, by which the details might be more easily classified and compared.

Some plan of this description must be adopted by all who aim at accuracy in their conclusions, and it is the experience of those most exercised in the process, that much time and trouble would have been avoided, could they have availed themselves of any well digested method for the purpose.

It is evident that it would be impossible to provide tabular forms for every gradation of the operation, because, with the increase of our knowledge, and the degree of sagacity in the observer, fresh

wants would arise, and additional indications present themselves; but we believe that much may be done to lighten the burden of what necessarily must prove a laborious undertaking, and also to stimulate the industry of many whose experience, deprived of such assistance, would moulder and perish in themselves.

We would therefore suggest that this department of the subject be also taken into consideration, limiting ourselves, on the present occasion, to propose certain formulæ, by which observations may be more easily and more correctly recorded, and their value enhanced, by the greater facility with which they may be collated and compared with other facts, accumulated by the same or different observers.

The particular form of table we have selected, is, of course, simply intended to direct the attention of members more distinctly to the subject, and not that it should be regarded in any way as definitive. It should also be recollected that whatever form may be thought preferable, it is contemplated to make it general in all our public Institutions; and it is hoped that when authorised by the Provincial Association, this essential condition of extensive utility will be attained. More simple tables might have been framed, but we do not wish to sacrifice the great end in view, to the motive of avoiding trouble, believing the latter evil to be rapidly diminished when habit has rendered us familiar with the method. It is always better to aim at more than we expect to accomplish, for practical results are below the standard of excellence we adopt, while they rise with the magnitude of the object we have in view,

and with the loftiness of the motive by which our efforts are sustained. Besides, the observer may simplify his practice of reporting to any extent he may think fit, and fill up as much or as little as he please; while those who aim at greater detail and minuteness of observation, are guided and assisted in their efforts.

On many of the headings introduced, no comment is necessary, but we may be allowed briefly to allude to the particular advantages of others.

It is evidently desirable to isolate, in the written observation, those details for the aggregation of which the second table is principally intended; and this is accomplished by the proposed heading.

The name of the Institution and of the medical attendant should be given, in order to prevent confusion, should the cases be transmitted to a distance, or analysed after the death of the collector.

The "*number*" is useful as a short and convenient means of reference, which may easily be carried through any number of secondary tables which ulterior analysis may require.

Ascertaining the "*duration*" of the case, is an element of great importance, and though impossible in many chronic diseases, yet is practicable in the great majority of acute, and certainly in some of the more protracted affections.

The "*anterior duration*" of the malady had better be given in days, unless of very long standing, when it may be noted in weeks, months, or years, which may be easily, if desirable, reduced to days when transferred to the second table.

Should the patient be detained by the rules of the

Institution, beyond the period at which he might have been discharged, a second date might be inserted, for the purpose of not giving a false impression as to the real duration of the disease.

It it very desirable that in all cases the "*supposed cause*" should be inquired into, and inserted as accurately as possible.

In noting the "*result,*" the term "*cured*" should be limited to those capable of resuming their occupation, and "*convalescent*" to those who have relinquished the use of medicine, and of whose recovery there is no doubt.

The "*diagnosis,*" in difficult cases, had better not be stated until a second or third examination, or still later if necessary; and in the second table ought not to be inserted until recovery or death had taken place. It should be as full and circumstantial as possible.

Under "*state,*" as married, single, &c., it would be desirable to mention the number of children. A capital letter and a single figure would be sufficient for both.

Dr. Streeten, in a letter dated Worcester, 19th September, 1837, justly observes that under the head "*occupation,*" the information should be as explicit as possible; instancing that if 'glover' or 'gloveress' were merely inserted, we should by no means furnish information calculated to indicate the real effects of the employment upon the health of those engaged, each branch having its peculiar influences and conditions, which materially modify the result. The interesting researches of Thackrah, Parent-Duchatelet, and others, prove the necessity

of attention to this fact, as well as the intrinsic interest and national importance of the subject.

Dr. Streeten also judiciously observes that the column for "*residence*" should always contain some intimation as to the character of it, whether low, damp, confined, airy, &c.

The space over which we have affixed the two headings, "*antecedent history and habits,*" "*summary of the case,*" may be either occupied, in accordance with the first, in commemorative relation of previous illness, habits, family liability, and other circumstances, by which the state of health might have been induced, and thus avoid complicating the actual history of the case; or it may be used for giving a rapid *resumé* of the leading features of the symptoms, morbid anatomy and therapeutics, by which both the nature and interest of the case may be rapidly gleaned when inspecting our observations for the purpose of making a selection, or obtaining more general results. The latter plan we are rather inclined to recommend as the most practically useful, since the other details may, without much inconvenience, be included in the general history of the case.

We would also advise a separate heading for "*family or hereditary liability,*" extensive and accurate information on the subject being much needed.

The *history* of the case must necessarily vary with the seat and nature of the disease; but as a general rule, it would be desirable to commence with a description of the symptoms and physical conditions of the organs which appear principally affected, and also to enumerate together all the symptoms belonging to the same cavity, heading them respectively—

'abdomen,' 'head,' 'chest,' &c.; or perhaps it would be preferable to follow a more strictly physiological arrangement, substituting for the above, 'digestive system,' 'circulation,' 'respiration,' &c. The object of this is to lessen the labour of revision; and it also possesses the collateral advantage of inducing a more systematic and useful mode of enumerating the symptoms.

Whatever inferences the phenomena of disease may at the time suggest, should be immediately noted down. "By this method," says the estimable and sagacious Parry, "which I strongly recommend to all persons engaged in scientific pursuits, whether physical or moral, I have often been able to ascertain the order of phenomena, and to catch new links, which have gone some way towards completing the whole chain of causes and effects."

The *post-mortem* investigation should be appended to the history of the disease; and at the termination of every observation, it would be very desirable if the physician would put down such thoughts and reflections as the nature and interest of the case may seem to demand.

The object and mode of employing the second table are not in need of explanation, and as many of the preceding comments are equally applicable to it as to the first, we shall content ourselves with very few additional remarks.

The introduction of a third column for including the "*total duration*" of the disease, tends to facilitate general results, and will not materially entrench either upon space or time.

How far a column for "*treatment*" is practicable,

we are somewhat in doubt, as perhaps it would not be compatible with such limited space, to enumerate a sufficient number of particulars to admit of very valuable induction. But still the terms 'antiphlogistics,' 'purging,' 'tartar emetic,' 'mercury,' and others, might be easily introduced, and, in certain diseases, would not be destitute of some practical interest. We would also recommend a column for "*hereditary liability*," as quite consistent with the tabular form. It is a question how far it would be advisable to have separate tables for males and females.

With the exception of the column headed "*disease*," and "*duration of disease*," it would be better to fill up the second table on the day of admission, as by this means the dating would be more regular, and the number of patients, corresponding to each subdivision of the year, more easily ascertained.

The first formula may either be arranged in a book, allowing two leaves for each heading, or loose sheets may be used, and afterwards collected and properly indexed. In large Institutions the appointment of qualified individuals, for the express purpose of reporting, and reducing their observations to a tabular form, would be attended with great benefit, and is a point worthy of fixing the attention of the Association. Habit would render the method less laborious, and point out some improvements in the process.

On the rules and precautions requisite for arriving at correct statistical results, the reader will find some very sensible remarks in the *British Medical Almanac*, for 1837, under the head of "Statistics of the British

Hospitals;" and we cheerfully acknowledge our obligations to the writer, recommending the article for perusal by all who feel interested in the subject.

In concluding these remarks, we cannot but advert to the objection of the trouble which the system we are proposing must involve. A careful inspection of the tables will, however, prove that this evil is more apparent than real, since the majority of the details may be filled up by a student, or any ordinarily intelligent individual; so that, in reality, no additional trouble, to any extent, is imposed upon the medical observer who takes observations at all, while he is more than rewarded by the conviction that the value of his labour will be greatly increased. To those who have never apprenticed themselves to the trade of observer, the plan we are suggesting will appear beset with difficulties, if not wholly impracticable. All we would say is, that it had better be tried before it is condemned, satisfied that if it be once adopted, and conscienciously pursued, its advantages are such, that it will not soon be relinquished. Indeed, no one can reflect on the nature of human knowledge, and on the means by which it must be acquired, and not be convinced that some plan like the present must, of necessity, be acted upon; for without it, we are deprived of materials for our conclusions, or left to the vague mementos of unrecorded experience. Of the uncertain value of this species of knowledge, we may form some opinion from the fact that the industrious Louis, when analysing his own observations, found that all his *á priori* conclusions were false. "With regard to the mode of establishing medical science," says

the sagacious Parry, "certain authors have thought it best to relate merely the result of their own observations, without entering into any detail of the facts on which their conclusions are founded. This is a most unsatisfactory method, arising from defective views of the nature of science, and tending to mislead, not only the reader, but even the author himself; for even the latter cannot compare all the circumstances of that mass of facts which is necessary, in order to establish just conclusions, without the opportunity of subsequently examining the several particulars, as they shall have been noted down at the period of observation. In the mode thus proposed, what security is there that the inferences of the writer are not either imperfect, or actually false; and why is the reader precluded from the means of forming his own judgment, and of correcting, or perhaps refuting, the conclusions of the author?"

We now leave the subject for the consideration of the members of the Association, hoping that they will bestow upon it that time and attention which its interest and importance demand.

Reading, 7th October, 1837.

All communications from the members of the Committee and others, to be addressed to the Secretary, Dr. Cowan, Reading.

No. 1.

Table for Registering Individual Observations.

183 Name of Institution, No Duration of Disease before admission, Date of admission, ——— discharge, Supposed cause, Hereditary liability, Result, DIAGNOSIS.	Medical Attendant, Name, Age, State, Occupation, Residence, *Antecedent History or Summary of the Case.*

History of the Disease.	Treatment.

No. 2.

Table for obtaining some of the General Results deducible from No. 1.

No.	Date of admission	Name.	Age	State.	Occupation.	Residence.	Disease.	Duration of the Disease.			Supposed cause.	Hereditary Predisposition.	Treatment.	Result.	Remarks.
								On entering.	On going out.	Total duration.					

MAP TO ILLUSTRATE Dr SHAPTER'S PAPER ON THE MEDICAL TOPOGRAPHY OF EXETER & NEIGHBOURHOOD.

Longitude 3° 41. W

50° 43.

REFERENCES TO THE STRATA

BLACK	BOVEY COAL
LIGHT GREEN	GREEN SANDSTONE
DARK RED	RED SANDSTONE
BROWN	TRAP ROCKS
VERMILLION	LIMESTONE
LIGHT BLUE	CLAY & GRAUWACKE SLATES
PURPLE	MICACEOUS SANDSTONE
DARK BLUE	LYDIAN STONE
DARK GREEN	GRANITIC GREEN STONE
YELLOW	GRANITE

DELTA OF THE EXE

REFERENCES

1st The numerals designate the height at which the places so marked are above the level of the sea.

2nd The words in this character, (MANGANESE refer to mineral deposits or the habitats of other natural productions.

SCALE OF MILES

Lewis, Engraver & Printer, Exeter.

PART II.

MEDICAL TOPOGRAPHY.

ARTICLE III.

ON THE

MEDICAL TOPOGRAPHY OF EXETER

AND

THE NEIGHBOURHOOD,

BEING A SKETCH OF THE GEOLOGY, CLIMATE, NATURAL PRODUCTIONS, AND STATISTICS OF THAT DISTRICT.

BY THOMAS SHAPTER, M.D.

Physician to the Exeter Dispensary, Lying-in Charity, &c.

Dr. Clark, whose extensive investigations on the climate of Europe offer such conclusive proof of the benefits to be derived from accurate information on this topic, makes it ground for complaint, that "notwithstanding the public attention has been so long directed towards the climate of Devonshire, it is extraordinary how few are the materials which can be collected, with a reference to this subject."*

He proposes, in order that the character of the climate may be properly determined, that observations should be made in different places within

* *Clark on Climate*, p. 45, 1830.

the south-western district of this island: it must, therefore, be matter of congratulation to the members of this Association, that the volumes of their *Transactions* already published, have done much towards this end, and have thus, in great measure, supplied the want complained of.

Drs Carrick and Symonds have, as far as their resources would permit them, illustrated the climate of Clifton and Bristol; while Dr. Forbes, of Chichester, has adorned the second volume of these *Transactions* with an essay on the Medical Topography of the Landsend, which may be quoted as a model for those directing their attention to these matters. It will be now my part to add another link to this chain of investigation, by inquiring into the positive condition of the physical climate and topography of Exeter and its neighbourhood.

The large promontory, or imperfect peninsula, known formerly as the ancient kingdom of Danmonium, projects westward into the Atlantic, beyond the main body of the island of Great Britain; it is the south-eastern division of this well defined district, that is now known under the name of Devonshire.*

It is a maritime county, bounded by the Bristol Channel on the west and north-west; on the west, by the river Tamar and a small rivulet called Marsland Water; on the south and south-east, by the British Channel; and by the counties of Dorset and Somerset on the east and north-east.

* The British name was Dyvnaint, while the inhabitants were called Dyvnonwyn, or inhabitants of Lowlands: it formed a part of the district included in the appellation of Danmonium.

It extends from 50° 12′ to 51° 15′ north latitude, and from 2° 50′ to 4° 32′ west longitude.

Its figure is very irregular, but approaches somewhat to a trapezium: in its greatest length Devonshire measures rather more than 70 miles, and at its greatest breadth about 68, and it contains 2579 square miles; its circumference is about 287 miles, 130 of which are sea-coast,—50 situated on the Bristol, and 80 on the English Channel.

By the trigonometrical survey it contains a surface of 1,650,560 statute acres; which consist of—

	ACRES.
Arable, meadow, and pasture land, ...	1,200,000
Of waste land, capable of becoming pasture,	300,000
And of incapable surface, ...	150,560

So that rather more than two-thirds of the whole surface is in cultivation.

The county, which is divided into 33 hundreds, contains 40 market-towns, and 394 parishes.

According to the population returns, the number of its inhabitants is thus stated:—

A.D.	INHABITANTS.
1700	248,000
1750	272,000
1801	343,001
1811	383,308
1821	439,040
1831	494,400

From the above it will be seen that the increase in population since 1700, amounts to 246,400; and that the increase in the 30 years, i.e. between 1801 and 1831, amounts to the amazing number of 151,399.

Nevertheless, Devonshire is below the average population of the British Isles, which is stated to be 220 for the square mile, while in this county it amounts to but 191.7 The increase on the square mile in the last 30 years is 58.7.

ON THE NATURAL AND PHYSICAL HISTORY OF EXETER AND ITS NEIGHBOURHOOD.

The portion of Devonshire to which our attention is now particularly directed, is that which includes the large and influential city of Exeter, with such of the neighbouring country as immediately surrounds it.

It would be difficult, as well as unnecessary, either to extend or to limit our observations on the medical topography of the district to any very arbitrary or artificial boundary. The subject may be better entertained by referring to such places and circumstances as are of more prominent interest in their relations to this city and its inhabitants.

The river Exe, flowing southward through the city, empties itself into the English Channel by a delta, which reaches from Hope's Nose or Tor Point, on the western side, to Budleigh Salterton* on the eastward.

On its banks, between the city and its embouchure, are situated, on the eastern side, the towns of Topsham, Lympston, and Exmouth: on the western, Exminster, Kenton, and Starcross.

On the shores formed by the delta, into which

* See the map which illustrates this paper.—As I have endeavoured in the map to have every place of sufficient interest mentioned, I shall not, for the future, refer to it.

flow the river Teign and the smaller stream the Daw, are situated East Exmouth, Littleham, and Budleigh Salterton, on the east; and on the west, Dawlish, East and West Teignmouth, Shaldon, and Babiscombe,—watering-places which are much the resort of persons for their summer recreation, and of eminent importance, as offering very different and peculiar advantages to the invalid.

The more prominent boundaries to the neighbourhood by land, are, to the south-west, Haldon; and, at some distance beyond, the long line of Dartmoor: the former presenting a protecting barrier of more than 800 feet above the level of the sea; while the latter is an extensive mountain ridge, whose mean height is 1782 feet,—its highest point, Cawsand-bog, being, according to the survey of General Mudge, upwards of 2090 feet.

To the north are the Whitestone hills, which, from their nearness and height of 740 feet, form a screen of the most essential benefit; these, with an interval of less elevated ground, are irregularly connected by the Stoke range to the Woodbury hills, which present themselves as the high lands to the eastward.

Physiognomy.—The district, within these limits, presents many and very remarkable features. The general physiognomy may be stated as being that of a succession of undulating high grounds, with luxuriant vales and small fertile valleys, which, for the most part, are in a state of high cultivation, and richly wooded by very lofty hedge-rows; these, which are thickly studded with elm and oak trees, (the former especially, in the vale of the Exe,) form the boundaries of, generally speaking, very small enclosures.

The uneven character of much of the neighbourhood, especially that which is on the slate formation to the westward and north-westward of the city, may be appreciated, by the fact, that in the very extensive park of Great Fulford, no one portion of ground could be found sufficiently level for the purposes of cricket.

On all sides these small undulating hills, diversified by bolder swells, increase in height as they recede from the city, and, eventually, are lost in the elevated ranges which form its protecting boundaries; so that Exeter, though for the most part standing on high ground,—that is, about 150 feet above the sea level,—is yet surrounded by a noble, though somewat distant, amphitheatre of hills on every side, excepting to the south-east, where the broad expanded estuary of the Exe opens itself to the English Channel.

Though we have not space to dwell upon the scenery of the district, it may not be inapposite to mention, that at almost every step varying scenes of rich home views and extended prospects present themselves; they are those which have greatly contributed to obtain for Devonshire the name of one of the most beautiful counties of the kingdom.

Having so far addressed myself to the limits and general character of the district itself, within which, as has already been mentioned, several coast and inland places are included, I shall now proceed to direct attention more particularly to the first in importance amongst them, viz., the large and influential city of Exeter.*

* By the Britons called Caer-wise, i.e., City of the Waters; and also Caer Rhyd, or Red City, from the colour of the surrounding soil.

This, the capital town of Devonshire, has been, from its position, size, and importance, justly termed the metropolis of the West. It may be described, in respect to its general geographical relations, as situated 170 miles to the west of London; in latitude 50° 43′ north, and longitude 3° 41′ west. It stands boldly on the eastern side of the river Exe, having a position, in reference to the county itself, of about 24 miles from the eastern extremity, and 30 miles from the western or Cornish side, 40 from the northern coast, 9 miles from the British, and 38 from the Bristol Channel.

According to the local divisions, Exeter is situated in the hundred of Wonford, and may be spoken of as a county of itself; but, as before stated, it is surrounded by the county of Devon, and forms a natural portion of it.

It occupies the flat summit and declivities of a hill, which rises from the eastern banks of the river. This hill, whose summit is 149 feet above the level of the sea, presents a gentle declivity on its southern side, but is abruptly steep on its western. From this hilly character of the surface, on which the city is built, great facilities for cleanliness and ventilation are afforded, notwithstanding the narrowness of many of the older ways.

It is divided by four cross streets, which, for the most part, contain the better shops for retail traffic; these streets divide it, sufficiently for our purpose, into four quarters. The western is occupied by the great mass of poor: much of this portion is situated on the steep declivity, running westerly down towards the town walls, thus affording to the district

the advantages of sufficient drainage and ventilation; the remaining, which is the worst and most confined portion of this quarter, is in a hollow flat, at the western foot of the declivity.

The south-eastern quarter is occupied by the resident gentry, and is open, pleasant, and healthful in its position. The remaining quarters, viz., the northern and southern, are occupied, generally, by persons, if not affluent, certainly, for the most part, in moderate circumstances.

The inhabitants are abundantly supplied with the purest water, by the conveyance of springs from some little distance to a public reservoir in the heart of the city; by wells, affording water of different degrees of hardness; and by a fine and capacious reservoir, which is supplied from the river two miles above the city. As the waters of the district will be more particularly spoken of, I shall defer saying more upon them in this place.

The system of drainage has latterly been much improved; it is only within a few years that the drains were merely surface gutters in the centre of the streets, necessarily the cause of much offensive unpleasantness. This has, however, been recently obviated, by an extensive series of sewers running underground through all the streets, with the further advantage of a local authority to oblige every house to communicate with them; so that there is now enjoyed a complete and healthful drainage.* This has been, in great measure, carried into effect since

* It should have been written "a NEARLY complete and healthful drainage." The medical man is even now, in some parts of the city, occasionally made sensible it is not so perfect as it might be.

the time that the pestilential cholera prevailed here in 1832, when the absolute necessity of proper drainage was too frightfully rendered obvious.

To be accurate, Exeter must be described as standing within certain limits on the eastern side of the river; but for the general and statistical purposes of the present paper, we must include the large and populous parish of St. Thomas, situated on the western side of the river, and immediately connected with Exeter by a conveniently built bridge; and we must also add the parishes of St. Leonard and Heavitree, which lie adjoining, on the south-east side of the city.

Thus we include, under the name of Exeter, these severally named parishes, forming, with it, a city and environs situated on either side of the river Exe.

One feature of the city must not be omitted; it is the beautiful walk of the Northernhay, situated on a natural terrace to the north of the city, and abounding in luxuriant elms and limes, which, rising considerably above the neighbouring houses, are seen, from all directions, to crown the city with a mass of dense foliage. Here, as in other elm plantations in Europe, the *Scolytus destructor* has committed its ravages, and the premature destruction of many of the noblest trees has taken place.

Besides natural causes, there has not been wanting, however, more artificial means of laying waste this spot.

Persequitur scelus ille suum, labefactaque tandem
Ictibus innumeris adductaque funibus arbor
Corruit.

ON THE GEOLOGY, SOIL, &c. OF EXETER AND ITS NEIGHBOURHOOD.

The importance of a due attention to this portion of our investigation has not been, generally speaking, sufficiently appreciated by medical men, either as regards its influence on climate, or the immediate effects which it may exercise on the human economy.

It is, therefore, with the greatest pleasure, that I am afforded the opportunity of quoting the following from Mr. Mc Clelland's "Inquiry into the Nature and Causes of Goitre.*" He says, the method he adopted, on observing the prevalency of the disorder in one great section of the district, (Kemaon,) and its absence in another, was to mark the physical characters by which these places were distinguished from each other. The consequence was, a perfect agreement in external aspect, altitude, and climatology, but a very marked difference in their geognostic relations; and this distinction was even traced down to the very villages in which the disease is found, with such perfect nicety, as to enable one, almost *à priori*, on examining the rocks of a neighbourhood, to pronounce whether the inhabitants were afflicted with goitre or not.

This evidence to the influence which may be exerted by particular geological formations upon the public health, must be my apology for entering somewhat carefully upon this topic.

In Devonshire is found a series of rocks between granite and chalk; the series is, however, by no

* Published in the *Dublin Journal*, for May, 1837; and extracted from a work on the Geology of Kemaon.

means complete, many of the intervening rocks being absent.

The granite of Dartmoor may be said to consist of fine-grained, moderately-sized, coarse grained, and porphyritic granite. This last, formed by a base of fine-grained granite of tolerably uniform appearance, in which are embedded large crystals of felspar, is common on the moor. Associated with this, somewhat roundish spots of an almost black colour may be seen; these are a composition of black hornblende and felspar, the former predominating, of a fine grain, and approaching to the nature of basalt.

All the combinations of the principles of granite may be found scattered over the moor, as well as masses of the principles themselves, lying independently, excepting the mica.

The quartz of Dartmoor consists of the common white quartz, occurring in detached masses, or in veins of greater transparency, and entering into the composition of the granite in differently sized grains, and variously crystallised; its colour is generally white or grey; often the apices of the more transparent crystals assume an amethystine hue.

The felspar is generally red, white, or grey, of various shades; but, occasionally, when in contact with what has been denominated shining ore, (a species of micaceous iron ore,) it is changed to an olive green, and appears to have lost much of its crystalline appearance, approaching to the nature of compact green felspar; sometimes this last is found scattered through a red granite, as in the Tor near Redway.

The felspar is found, in crystals of various sizes, disseminated through the granite; it is also occasionally found in very considerable independent masses, and but little mixed with other matters. Two instances of this have been observed, in which the colour of the felspar was red; one at the top of the hill entering Moreton, the other at the quarry, near Willey, whence the Devonshire tourmaline may be obtained.

In many parts of the moor the felspar has become decomposed, lost its crystalline appearance, and crumbled into a white powdery clay: this appears particularly the case on the borders of the moor; it is seen on the sides of the old road leading to Moreton, and adjoining Bovey Tracey on the road to Willey.

In the decayed state, granite has obtained the vulgar name of growan stone, and into its hollows the decomposed clay is washed; it is this which affords the fine clay used in the manufacture of china, &c., so much of which is conveyed to the potteries at Worcester.

The great plain of Bovey Heathfield affords a singular instance, consequent on the decay of the older rocks; it appears to have once been an immense pit; at present it is filled with clay, the produce of the decayed rocks of Dartmoor; it has been bored to the depth of 220 feet, at which depth there was still clay and sand.*

In some parts of the moor, where the ground is level, and the clay, therefore, less readily carried off,

* For the peculiar formation called Bovey coal, vide Appendix No. 2.

it has sunk two, three, or more feet beneath the surface, forming a bed under the quartz sand, from which, by its decomposition, it had been separated.

The Mica of Dartmoor is commonly crystallised in small plates, and thinly, though generally, disseminated through the granite; it has not been found in large masses; its colour varies from brown to black.

The mineral substances found in the granite are hornblende, schorl or tourmaline, apatite, compact felspar, chlorite, lead, copper, tin, iron; and, of vegetable origin, peat. But as the minerals of the neighbourhood will be particularly mentioned in Appendix, No. 2, I shall not further speak of them here.

There are considerable remains of stream tin works, some few are still carried on, as well as the working of underground mines.

The geographical and geological situation of that portion of the granite district which, from its vicinity, falls within our present view, begins in Whiddon park, about one mile and a half above Teignbridge, where it is found crossing the river from the north to the south side, directing its course east-south-east. The boundary line then rises rapidly from the bed of the river to the hills over Moreton woods; thence it continues in nearly the same direction along the ridge of these hills, and almost parallel with the river, to the top of the hill opposite Dunsford; from this it suddenly takes a southernly direction, in which course it nearly follows the direction of the river, and terminates in the clay of Bovey Heathfield, near Bovey Tracey.

In this line the granite appears to be connected with two rocks only,—flint slate or lydian stone, and greenstone or the granite compound of felspar and hornblende. It is in conjunction with flint slate from Whiddon park to that part of its boundary which could be crossed by a line drawn from Doddiscombsleigh to Moreton; from thence to Bovey Tracey, it is in conjunction with granitic greenstone.

Greenstone.—The greenstone of this district is of that kind which modern geologists have termed granitic, to distinguish it from that of the trap family, with which it has been confounded. It is a true granitic compound, consisting of felspar and quartz; the felspar is sometimes red, sometimes white; when white, the mixture of blackish-green hornblende gives a greenish hue to the stone, whence its name. It appears here that the granite loses its quartz, while its mica passes into hornblende; thus arises this change into granitic greenstone. That this is the case, is evident from the situation of the greenstone, and from its connexion with the granite, as well as from the imperceptible passing of one into the other in all granite countries. We can, therefore, consider this greenstone, though differing from granite in composition and appearance, merely as a continuation of the granite series, and not as a distinct rock.

Like the granite, it passes under the slate, and after we have lost it, we again find it penetrating through the slate on the tops of the various hills, both in the forms of masses and boulder stones. Instances of this occur both in Ashton and Doddiscombsleigh. On the top of the hill, in the latter

parish, it is quarried in two places; and, what is remarkable, a little to the east of these quarries, on the top of the same hill, the flint slate or lydian stone is found pushing up, and is also quarried. On the side of the hill, and under these quarries, there is a quarry of alternating beds of limestone and flint slate. Where the greenstone enters, it appears to cut off equally the flint slate and the alternating beds of limestone.

A remarkable rock of this kind, of a very fine grain, with an increased proportion of hornblende, and nearly resembling basalt, is found penetrating through a high hill at Hennock, called Botter Rock; at first sight its masses have the appearance of regular crystallisation, but, on examination, this will be found to be nothing more than the irregular forms into which this rock separates.

It joins the granite of the moor till it meets the slate before mentioned, somewhere between Hennock and Bridford; they then leave the granite in conjunction, and pass on towards Doddiscombsleigh.

The flint slate is the first lost in the clay and grauwacke slates, and then the greenstone; this latter may be traced, in conjunction with these, as far as Bovey Tracey.

The Schistose Rocks of this district may be divided into flint slate, clay slate, and grauwacke slate.

The Flint Slate, occasionally called lydian stone, is an exceedingly hard compact rock, of various tints of grey and blue, and occasionally reddish and olive green; its slaty structure is not always discernible in its perfect crystalline form, but may be generally seen on the approach of decomposition. It is

bounded on the west by the granite, on the east by the clay slate, on the south by the greenstone, in a line nearly at right angles with the Teign, which it crosses about two miles above Dunsford.

In some places it appears to terminate suddenly; in others, to pass gradually into clay slate. It is very various in appearance, and may be found in lydian stone as common flinty slate, and often as bone stone, and even green, resembling Turkey stone; it is also found passing into jasper.

The Clay and *Grauwacke Slates* may be considered together, as they are found constantly alternating. Rock grauwacke may also be included, the difference between this and the slate depending only on the schistose form being wanting.

The clay slate, of which common roofing slate and the schorl slate are varieties, is too well known to need description.

The grauwacke slate is clay slate, having embedded grains or small masses of other rocks, as quartz, flint slate, &c. This may easily be distinguished from flint slate, by the latter having both a conchoidal fracture, and the fractured sides being smooth. The grauwacke inclines to fracture in somewhat rhomboidal masses; the fractured sides are rough, and have the appearance of a hard fine grained sandstone, and it almost always alternates with clay slate.

The course of the beds of schist in this district is about south-east and north-west, and they are elevated very considerably to the horizon, perhaps not less than 60′ or 70′. This general elevation must, of course, be considered as distinct from that

variety of direction and curve that is given to the beds of slate in particular places.

The layers of grauwacke slate frequently appear of considerable thickness, become much indurated, lose the schistose appearance, and split into a variety of angular forms, thus passing into massive grauwacke.

The colours of these rocks are grey, blue, green, and red, but generally dull. They vary much in hardness and durability, being in some places friable, in others exceedingly hard. They have, occasionally, a conchoidal fracture, but the fractured surface is not smooth like flint slate.

The grauwacke and clay slates appear of a firmer and more crystalline structure as they approach the granite; the same appears to be the case as it is followed deep in the earth. On the other hand, these rocks become less compact as they approach the red sand which bounds them on the side opposite the granite.

Near the granite, and at great depths, these rocks are, for the most part, of a deep blue; whilst at the surface, where it is decomposed, and near to the red sandstone, the various tints of red, green, and purple, are most commonly met with.

The geological situation of these rocks in this district is above the greenstone and flint slate, and underneath the red sandstone.

The Red Sandstone, or *Conglomerate* of Devon, is a rock of a nature totally different from those hitherto mentioned. The former we have noticed as being more or less crystalline, their beds, excepting the granitic series, generally highly elevated;

whilst this rock is neither crystalline, nor are its beds elevated, but it is composed of nearly horizontal beds of sand, clay, marl, and conglomerate, irregularly mingled together. Here, however, a remarkable fact arrests our attention; the separate masses of conglomerate are of the greatest magnitude in those parts of the rock which most nearly approach the older rocks; these masses appear to be portions of porphyritic serpentine, and other rocks, of which, at present, no vestiges are to be found; and yet are they found intermixed with portions of other rocks still existing in the vicinity.

There can be no doubt that this conglomerate rock is identical with the grauwacke formation of Werner; but I cannot refrain from expressing a feeling that the sooner this word is forgotten, the less confusion will exist in regard to this formation.

The line of junction between this rock and the slate passes through Exeter: it is laid extensively open on the coast from Minnycombe, where it is in junction with the secondary limestone, to Branscombe, near Beer. The rocks of the coast, in fact, consist entirely of this conglomerate.

At Exmouth, where the rocks face the sea, there are two remarkable beds of whitish sandstone, extending nearly from the top to the bottom of the cliffs: near the bottom, a considerable dislocation has taken place, and these beds appear to have fallen, and are found under the sand of the shore in a position nearly horizontal.

The conglomerate is crossed in various districts by veins of a more durable nature than the rock itself, which latter more readily decaying on expo-

sure to the air, leaves the projecting hard veins to form various curves and hollows, thus giving to the rock a grotesque honeycomb appearance, very characteristic of many points of the south coast of Devon. These veins, where they approach the older rocks, are mostly composed of sand, agglutinated by iron; but near the chalk formation they consist of calcareous spar.

This conglomerate lies upon the clay slate, excepting in some instances where limestone or trap intervenes, and is covered by the green sandstone.

In digging wells in this city, through which the surface line of junction passes, nothing is more common than to meet with from fifty to eighty feet of red sand, and the clay slate afterwards; its passage under the green sand may be readily seen on ascending any of the green sandstone hills in the vicinity.

The Green Sand Formation occurs chiefly on the summits of Great and Little Haldon; it is a fine-grained sand, coloured by chlorite. There can be no doubt that it is identical with the green sand of Black Down; it is immediately incumbent on the red sand, and has lying upon it vast strata of the chalk flints.

Such are the regular strata of this district; but the very important rocks of the clay-stone trap and the secondary limestone, are not unfrequent intruders.

The traps generally are not found, like the others, forming regular strata, or conforming to that series in which the others are found; they are unstratified, and met with as veins, or as immense rocky masses lying on any other of the stratified rocks, without appearing to observe any order in their position with

respect to them. Those of this district are all either clay-stone or clink-stone; they are tolerably uniform in their structure, and the being acquainted with the varieties of one quarry, will lead to an almost certain recognition of all the many occurring masses; they are in considerable repute for the purposes of building, and as such are very extensively quarried.

As it would be tedious to point out here their defined localities, I shall satisfy myself by referring to the map, where these rocks are distinguished by the orange colour; and for the more particular description of their formation, to the Appendix.

They, for the most part, rest on the schist, and appear to be rather associated with it than with any of the other rocks; and certainly not with the red conglomerate, as portions of trap are found occasionally mixed with it.

The only remaining formation to be spoken of is the transition limestone. It occurs on the south-western extremity of this district; its most eastern boundary is Pettytor, where, and at Chudleigh, its characters may be studied; it lies upon the primitive slate; it is of all colours, varying from blueish-grey, which most prevails, to a red and yellow, and is one of the most important rocks of the series, yielding to the farmer the manure so much required by the heavy soils of this district.

From the above view of the strata, the general character of the surface and soils may easily be understood; they must necessarily vary much, ranging from the granitic, through the cold slaty soils, to the fine rich loam lands on the sandstone.—As I am not aware of any peculiarities, I shall not dwell further upon them.

Valleys.—The valleys of this district are, for the most part, of the class called lowland, and their sections shew merely lines of varying undulations; in some instances they are of considerable depth, while in others they are particularly shallow, the opposite summits being at great distances from each other.

For the most part they are valleys of denudation. A peculiar interest is attached to them, as they are those on which Professors Playfair, De Luc, and Buckland have founded their opposing theories on the formation of valleys generally.

The vale of Exeter is somewhat narrow at Bickleigh, but it soon opens and expands itself; it contains in area 200 square miles, and presents a surface of great capabilities. Such is its character in the present day; De Luc, however, thinks that at a former period it was far otherwise—that the hill on which Exeter stands was a long promontory, and that the neighbouring vale was marsh.

This different condition of the geognosy is somewhat confirmed by Malmesbury, who states the city to be situated in a marshy soil "which will scarcely yield bad oats, often only producing empty husks without grains." This is further corroborated by the fact, that a few years since, while the operations for the extension of the canal were in progress, on cutting through the alluvial soil, a subsoil of peat, of considerable thickness, presented itself. The alluvial soil contained many bivalve shells, chiefly of the genera *Tellina* and *Mactra*, arranged in layers, and which would appear to mark the periods of successive deposits.

Hydrography.—Perhaps there is no portion of physical geography more important in its relations to man, than the consideration of the waters of the district he inhabits; whether they are to be regarded in relation to commerce, or to his health and comfort, they equally call for observation.

The little district which now occupies our attention, is much famed in all these respects, enjoying the advantages of rivers, streams, and springs in abundance.

The river Exe,* which is the great and important water of the district, has its origin in the extensive moor district, situated partly in Somersetshire, and partly in Devon, called Exmoor.

Passing through much varied and beautiful country, it expands itself into a fine river at Tiverton; then winding through the romantic and wooded vale of Bickleigh, it enters the district now under our notice; and flowing over the sand formation between the red rock of Thorverton and Silverton, and between Brampfordspeke and Netherex, it pursues its course over the slate† to Exeter.

Below the city, at the quay, it again flows upon a bed of red sandstone, falls over many weirs, and passing through fertile meadows, reaches Topsham; then passing between Lympstone and Powderham, and over the bar, (which is of red conglomerate, and not of sea sand as is generally supposed,) empties itself into the English Channel, having, from its rise to its mouth, pursued rather a direct course of sixty

* The Isk of the Britons; the Isca of the Romans; and the Ex or Exe of the Saxons and moderns.

† This formation is provincially called shillet.

miles. In this course it has a fall of one foot in four hundred and eight.

The Exe receives, as tributary rivers, the Quarm, the Haddo, the Barle, the Batham, the Loman, the Creedy, the Culm, the Kenn, and the Clist; the four last are within this neighbourhood.

The mouth of the river, which extends to a breadth of three miles, is much obstructed by two shoals of sand, called "Poles," of unequal breadth, and advancing in a parallel direction: as these shoals are not connected, they have merely the effect of narrowing the channel, and not of lessening its depth. The greater mass of the sand bank on the western side of the river is called the Warren, and is now raised above the sea-level; it appears to have been reclaimed through the agency of the *Arundo arenaria,* which has retained the sands carried by the south winds.

The height of the river is materially affected by the sea tide to within a mile of the city, where further influence is prevented by a weir which crosses the current opposite the old abbey.

At Exeter quay the breadth of the river is about one hundred and twenty feet, and its depth averages rather more than nine.

The general character of the water of the Exe, is that of being clear, soft, and pure; indeed, from a comparative analysis of this and the waters of the neighbouring springs, which will presently be detailed, I can have no hesitation in stating it to be more pure than any other of the district; iron, of which there is but a trace, and muriate of lime, are the only foreign matters to be met with.

Its taste, however, from a deficiency of fixed air, is somewhat flat, and, consequently, not so pleasant as a drink; but for all domestic purposes it is perfectly unobjectionable.

After continued heavy rains, it is subject to be much flooded, when its waters come down greatly discoloured, especially after the junction of the Creedy, which rising near Cruwys Morchard, passes through the rich red country between Sandford and Upton-Hellions, and discharges itself, overloaded with this soil, into the Exe, two miles above the city; these occasional impurities are merely suspended, and do not form part of its chemical composition.

The following interesting list of the great floods is kindly furnished me by my friend Mr. White.

In 1810: Nov. 16.—The greatest flood ever known, caused by the melting of snow on Exmoor, together with thirty-six hours rain. The waters rose to between 13 and 14 feet above the summer level of the river at Exeter.

N.B. 1810: Nov. 10.—A great flood, not so high as the former.

1811.—A great flood.

1818: March 5.—A flood, with a gale of wind: the water a considerable depth in St. Thomas.

1823: Nov. 23.—A great storm, with high winds: much damage done on the coast: great flood.

1827: Oct. 9.—Water 6 feet above summer level.

—— Dec. 23.—Water 6 feet 2 inches above summer level.

1828: Jan. 13.—Water $6\frac{1}{4}$ inches above summer level: violent storm. In July and August the water was, several times, higher than it had been in November and December.

1829: April, July, August, and September.—Water, several times, from 3 to 5 feet above summer level.

1830: Dec. 7.—Water 6 feet above level.

1831: Dec. 12.—Water 6 feet 1 inch (no snow).

1832: Nov. 15.—Water 6 feet 5 inches.

1833: Feb. 14.—Water 5 feet.

—— Feb. 15.—Water 7 feet 2 inches.

—— Feb. 20.—Water 6 feet: violent storm: wind west and north-west.

1833: Dec. 18.—Water 6 feet above summer level.

1835: Nov. 4.—Water 6 feet 4 inches.

1836: Nov. 29.—Water 6 feet 7 inches: violent hurricane from half-past nine to ten, a.m.: wind west and north-west.

As the remaining rivers and streams are of minor interest to the inhabitants of this city, and present nothing, as far as I am aware, sufficiently peculiar in their condition, either as regards their fall or composition, to render it necessary to dwell upon their description, I shall at once proceed to a consideration of the general and chemical character of a few of the chief springs of Exeter and the immediate vicinity; and in doing so, I shall select those that may be fairly taken as illustrative of the waters of those geological formations from whence they arise.

The Conduit, for the public supply of the city, and which has been used by the inhabitants for more than four hundred years,* derives its source at the

* Jenkins says, "The great conduit at Carfoix, venerable for its antiquity, which had been standing near three hundred years, and had often poured wine to the rejoicing citizens, now fell a victim to modern improvements." This was taken down in 1770, and a new building erected, to which the cistern was removed.

upper part of the parish of St. Sidwell, from two springs which issue out of the red conglomerate. These springs yield an imperial hogshead of water in three minutes and fifty-two seconds. This is collected and conveyed, by pipes, to the cistern, which has been, within the last three years, removed to the western quarter of the city, and close to the eastern entrance of the lower market-house. The water is clear, transparent, tasteless, and inodorous. It has a specific gravity of 1002; its temperature is 53°; and it contains traces of carbonic, sulphuric, and muriatic acids, which are combined with lime; it contains no trace of iron.

Parker's Well is another public spring, and is situated in the parish of St. Leonard; it has its origin in the same formation as the preceding, and does not essentially differ from it in its general and chemical characters; it has a temperature of 52°, and a specific gravity of 1002.

Similar to these are three other springs which I have examined in different parts of the city, situated on the red conglomerate; we may, therefore, fairly assume the above to be the general character of the waters issuing from this formation.

A Well in the Cathedral Yard.*—The water of this well has its origin in the clay trap formation; it is sparkling, clear, transparent, inodorous, and slightly styptic to the taste. It has a temperature of 52°, and a specific gravity of 1003. It contains a small proportion of free and fixed carbonic acid; an appreciable though very small quantity of iron; a considerable quantity of lime and of muriatic

* Attached to the residence of Mrs. Nutcombe.

acid; as also a moderate proportion of sulphuric acid and alumina.

The other waters that I have examined are those from springs at Cleve, Whitestone, and Perridge. These springs each have their origin in the slate district: their general character is that of being clear, sparkling, inodorous, and very styptic, generally depositing, after exposure to the air, a quantity of the peroxyde of iron. Though each possesses the general characters of a chalybeate water, they differ somewhat in their composition.

Cleve Spring.—Temperature 51°5; specific gravity 1002. It contains of free carbonic acid, a considerable proportion; fixed carbonic acid, a considerable proportion; iron, a considerable proportion; lime, but a small proportion; muriatic acid, a considerable proportion; sulphuric acid, a considerable proportion; alumina, a trace.

Perridge Spring.—Temperature 52°5; specific gravity 1003. It contains of free carbonic acid, a moderate proportion; carbonic acid, a moderate proportion; iron, a large proportion; lime, but very little; muriatic acid, a considerable proportion; sulphuric acid, but very little; alumina, none.

Spring at Whitestone.—Temperature 52°5; specific gravity 1003. It contains of carbonic acid, a moderate proportion; iron, a very large proportion; lime, only a trace; muriatic acid, a very large proportion; sulphuric acid, a very slight proportion; alumina, none.

It will be seen from the above statements that I have endeavoured, as clearly as words alone will

permit, to express the relative proportions in which foreign matters occur in these springs. It is a source of much regret that I have not had the opportunity satisfactorily to conclude a quantitative analysis of these waters; I have, therefore, preferred giving the results in this indefinite mode, to quoting my, at present, imperfect calculations.

In taking a view of these waters, we may say that those occurring in the trap and conglomerate formations, may be termed common hard springs; but that some of them contain mineral impregnations in nearly sufficient quantity to entitle them to be called mineral waters. The general character of the waters in the slate formation is that of the acidulous chalybeate, which, in some instances, (as the three of which the analysis is given,) contain their peculiar impregnations in quantity sufficient to warrant their being termed mineral waters.

CLIMATE.

The climate of this portion of the British islands has long been much celebrated as peculiarly mild, genial, and equable, and, as such, is the frequent resort of the invalid, and those returning from the warmer climates of the East. It is, therefore, remarkable how very little certain information has been communicated as to its absolute condition; in fact, no series of details, as far as I am aware, has ever been

published on those combinations of temperature and moisture which are understood to constitute it.

There are many circumstances which exert an influence on, and may thus be said to determine the physical climate of, a district. Professor Leslie, however, is greatly inclined to restrict them, and expresses himself somewhat strongly, when he says that all the different causes are reducible to these two—distance from the equator, and height above the level of the sea. But, with every deference for the opinion of one so justly esteemed for his accuracy, I think we must not disregard the influences which may be exerted by the relative masses of water and land,—the aspect of the sloping side,—the nature of the soil,—the extent of cultivation,—nor, more especially, the prevalence of particular winds; each of these causes, in reference to Exeter, with the exception of the last mentioned, has been already attended to. We may, therefore, without further delay, enter upon the subject of the absolute climate, as deduced from actual observations, pointing out, as we proceed, to what probable extent the above circumstances tend to modify its condition.

First, as regards the climate, as calculated from its latitude, which has been previously stated to be 50° 43′ north. This distance from the equator, from which may be deduced the local mean influence of the sun's rays, gives a temperature at the level of the sea of 53°, with the almost extreme variation of 90°; and did land of sufficient altitude exist at this spot, the line of perpetual snow would be 6167 feet above the sea level

Such is the theoretical condition of the atmosphere for Exeter, as calculated by the formula of Leslie.*

According to the table of Ptolemy, and which is esteemed sufficiently accurate, this district is in the 18th climate, or parallel, with 16 hours and 15 minutes for the length of its midsummer day, and 1° 36′ for the breadth of the zone.

Baron Humboldt, however, laying aside every theoretical consideration, has endeavoured to arrange the places on the earth's surface, under what he terms isothermal lines,—these lines being determined by the mean temperature of the places themselves. According to this system, he places Exeter (erroneously certainly,) on the northern side of that line, the like temperature of which is stated to be

* From a comparison of meteorological observations, made at distant points on the surface of our globe, the celebrated astronomer, Professor Mayer, of Gottingen, was enabled to discover an empirical law which connects, most harmoniously, the various results. Round the pole the mean temperature may be assumed at the precise limit of freezing, since the fields of ice, accumulated in that forlorn region, seem at this present period neither to increase nor to diminish. But under the equator the medium heat, at the level of the sea, is found to be 84 1-5th degrees, Fahr., or 29 centesimal degrees, the division of the thermometric scale, which is the best suited to philosophical purposes. At the middle point, or the latitude of 45°, the temperature is likewise the exact mean, or $14\frac{1}{2}$° centigrade. From that centre the heat diminishes rapidly northwards, and increases with equal rapidity towards the south. Hence the mean temperature of any place at the level of the sea is calculated, in centesimal degrees, by multiplying the square of the cosine of the latitude into the constant number 29; or it is found by multiplying the supplemental versed sine of double the latitude into $14\frac{1}{2}$°. The variation of temperature for each degree of latitude is hence denoted centesimally, with very great precision, by half the sine of double the latitude; being, in fact, this quantity diminished in the ratio of 58, the double of 29, to 57°.3, the length of an arc equal to the radius.

50°, and within that zone whose annual mean ranges from 41° to 50°; the extreme range during the year being estimated at 32° 5′.

This system is here particularly mentioned, as an attention to it will very much facilitate such comparison with other districts as may be deemed desirable.

We will now state, from observations made in this city and the immediate neighbourhood, what the climate really is, and endeavour to account for the variations from the above stated climate, as theoretically deduced.

The sources from which the following abstracts have been made, are registers kept by Dr. Barham, in the parish of St. Leonard; by Mr Ponsford, Surgeon to the Lunatic Asylum; and by Mr. Squance, Librarian of the Exeter Institution. This latter station is situated in the cathedral yard, and is in the centre of the town; while the asylum is at the western extremity of the parish of St. Thomas.

The averages are, in almost every instance, deduced from observations made during a period of ten years, i.e., from 1825 to 1834 inclusive, and are contrasted with those deduced from the registers kept in the metropolis. This system of comparison has been adopted by those gentlemen who have preceded me with papers on Provincial Climate, and for the sake of uniformity I shall follow them in this particular.

The means and differences are alone stated in the following sketch, as it would much embarrass a clear

view of the subject to include the tables* themselves whence the results have been deduced.

The annual mean temperature.

Exeter.....	51°.29
London	50°.39

From this it appears that the mean annual climate of Exeter is nearly a degree higher than that of London: but there can be no doubt the proper mean of the district of London is in this view very considerably overstated. Luke Howard, and he is confirmed by Daniell, states the mean for the latitude and level of London not to amount to more than 48°.5. In stating it to be 50°.39, I follow Drs. Forbes and Clark, who have taken, as their standard, the results derived from registers kept in the heart of the metropolis itself, where the climate is necessarily much influenced by the local circumstances of a great city. With this explanation, the relative characters of the climates of these places may be better appreciated.

The mean temperature of the earth is.....	66°.8
The temperature for the latitude of Exeter, at the level of the sea, is 53°, from which, to allow for altitude,† about one-third of a degree must be deducted, thus giving the theoretical atmosphere of	52°.60

So that Exeter is 5°.51 below the mean of the earth, and 1°.31 below its calculated climate.

* Those who may desire to refer to the tables will find them in Appendix No. 3.

† Temperature is calculated to decrease about 1° for every 100 yards of altitude.

The following are the observed differences and means for ten years.

Mean temperature for ten successive years.

	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Exeter...	53.06	53.74	51.92	52.59	48.73	49.80	51.62	49.76	50.11	51.57

Difference of temperature in succeeding years.

	1825 and 1826.	1826 and 1827.	1827 and 1828.	1828 and 1829.	1829 and 1830.	1830 and 1831.	1831 and 1832.	1832 and 1833.	1833 and 1834.
Exeter ...	.68	1.82	.67	3.86	1.07	1.82	1.86	.35	1.46

Difference between warmest and coldest years.

5.01

Mean temperature of those years above the mean of the climate	52.41
..... below	49.60
Difference	2.81

Mean difference of temperature in succeeding years.

1.50

It has been noticed* that there are an ascending and a descending series of temperature, rising and falling by alternate years, so as to render it probable that we have in this island a cycle of temperature in which the climate becomes warmer and colder by turns, in such a way as to exhibit both extremes in the space of seventeen years. The above tables somewhat bear out this observation, and the five

* Vide Luke Howard's Lectures on Meteorology.

degrees, which is the difference between the coldest and warmest year of this series, will be found very nearly to balance the mean of the differences in the ascending and descending years, which is 2°.80.

Mean temperature of the months.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter ...	39.06	41.73	44.47	48.73	55.34	60.33	63.64	62.27	56.97	53.29	45.58	43.43
London ...	37.3	40.4	42.6	48.0	55.6	60.0	63.4	63.5	58.8	51.7	43.4	39.5

Difference in mean temperature of succeeding months.

	Jan. and Feb.	Feb. and Mar.	Mar. and Apr.	Apr. and May.	May and June	June and July.	July and Aug.	Aug. and Sept.	Sept. and Oct.	Oct. and Nov.	Nov. and Dec.	Dec. and Jan.
Exeter ...	2.66	2.73	4.26	6.61	4.99	3.30	1.37	5.30	3.68	7.70	2.14	4.36
London ...	3.3	2.2	5.3	7.6	4.3	3.4	0.1	4.7	7.	8.3	3.8	2.2

The mean difference of temperature in succeeding months.

Exeter 4.09
London 4.3

Difference of mean temperature between warmest and coldest months.

Exeter..... 24.57
London 26.2

SEASONS.

Mean temperature of the seasons.

	Winter.	Spring.	Summer.	Autumn.
Exeter	41.80	49.51	62.08	51.94
London.....	39.1	48.7	62.3	51.3

Difference in mean temperature of successive seasons.

	Winter and Spring.	Spring and Summer.	Summer and Autumn.	Autumn and Winter.
Exeter	7.71	12.57	10.14	10.14
London.....	9.6	13.5	11.	12.2

Difference of mean temperature between winter and summer.

Exeter.....	20.28
London	23.2

Mean of the maximum daily temperature for each month.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter	51.2	55.2	58.6	65.4	72.8	77.7	81.5	77.6	71.1	65.4	59.6	56.3
London	40.28	44.63	48.0	55.3	64.	68.3	71.5	71.2	65.6	57.0	47.2	42.6

Mean of the minimum daily temperature for each month.

	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter	25.1	26.8	29.9	32.5	38.4	45.5	48.1	46.6	42.1	36.2	28.7	31.0
London	31.2	33.7	35.3	39.4	46.5	49.7	53.8	53.9	48.6	43.5	36.4	33.9

Difference between the mean maximum and mean minimum temperature for each month.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter	26.1	28.3	28.7	32.9	34.4	32.2	33.4	31.0	29.0	29.2	30.9	25.0
London	8.9	10.9	12.7	15.9	17.5	18.6	17.6	17.2	16.9	13.5	10.7	8.7

Mean difference between the temperature of day and night.

Exeter	30.
London	14.14

Difference between the mean temperature of day and night at each season.

	Winter.	Spring.	Summer.	Autumn.
Exeter	26.6	31.3	32.	29.
London	9.5	18.7	17.9	13.8

Variation in temperature of successive days for the whole year.

	Mean variation.	Extreme variation.
Exeter	3.3	27
London	4.0	18

Mean range of the thermometer.

	Annual.	Monthly.	Daily.
Exeter	59.0	29.9	6.7
London	64.0	34.	11.0

Absolute range.

	Greatest.	Lowest.	Mean.
Exeter	94	16	70
London	96	5	91

From the preceding tables it may be seen that the climate of this southern portion of Devonshire,

though not so equable as that of Penzance,* is justly worthy of its character as to mildness, for which it is so generally esteemed. There are some points, however, which are worthy of remark: the most important is, the very much greater difference than could possibly have been expected, which occasionally takes place in the means of succeeding years, and in the corresponding seasons of these years.

For instance:—the difference of the means between 1827 and 1828 amounts to 3°.36, nearly three degrees and a half.

In ten years we have shewn a mean range of 5°, a difference of which nearly the whole amount took place in the winter of 1826–27, as compared with that of 1827–28. These two winters give a mean variation of 4°.60.

Dec. 1826 ...	46.00	Dec. 1827 ...	47.30	Difference	1.30
Jan. 1827 ...	39.48	Jan. 1828 ...	43.69	———	4.21
Feb. —— ...	35.60	Feb. —— ...	43.91	———	8.31
Mean	40.36	Mean	44.96	———	4.60

And we also see that the corresponding months of February, in these two succeeding years, differ to the very great extent of eight degrees.

These variations of climate are especially worthy of notice, and no means should be disregarded in

* Vide paper on the Medical Topography of the Landsend, by Dr. Forbes. Vol. 2, of these *Transactions*.

making the fact obvious; since this is the origin of much acute and fatal disease, which, there can be no doubt, might be greatly avoided, were only due caution observed. All classes, the poor especially, are lulled, by the mildness of many successive winters, into a carelessness of clothing, and general improvidence against the effects and consequent distress of severer weather, so that those years, the mean temperature of which is low, are fraught with a more than usual proportion of privation and mortality.

The mean temperature of the months shows us a scale, commencing at a minimum in January, progressively increasing to a maximum in July, and then as gradually decreasing through the remaining months, till the minimum of January is again attained. The increase is very gradual during the months of January, February, March, and April. Between April and May it is very considerable, that is to say, it is more than half of the whole difference between spring and summer. The decrement is only great between August and September, and October and November. In London, the great falls of temperature take place only during September, October, and November, and the maximum temperature is not attained till August.

In the seasons, the greatest change of temperature is between the spring and summer, and the least alteration is between winter and spring; but when contrasted with London, the equability of climate is very marked, since, although the mean temperature of Exeter is greater than that of London, yet the tem-

perature of the summer of the latter city has a higher temperature, while its winter is considerably lower.

That the climate here is generally more equable, and the winters much milder than in most places of a like mean temperature, is rendered sufficiently obvious if we look, first, at such as are within the same zone of temperature; and secondly, by drawing an isotherial line, and regarding how much the mean temperature of the places it cuts are in excess of that of Exeter.

Amongst the first class are Vienna, with a winter whose mean is 32°.14, and a summer of 69°.26; and Manheim, with a winter of 38°.80, and a summer of 67°.10.

Clermont and Brussels, together with other places too many to mention, which are in the zone nearer to the equator, yet have a mean temperature scarcely superior to that of Exeter, exhibit variations in their winter from their summer, the temperature, in the first of these places, ranging from 34°.52 to 64°.40, in the second, from 36°.68 to 66°.20.

Were an isotherial line to be drawn from this district, it would fall upon such places as Nantes, with a mean annual temperature of 54°.68; Bourdeaux, of 56°.48; and St. Malo, 54°.14, &c. No stronger proof need be offered than these facts afford, of the comparative evenness of this climate; and I very much question whether there be any portion of the British isles, with the exception of the Landsend, that can vie with this district in this respect.

On comparing the differences of temperature between day and night in this district with the corresponding diurnal differences of London, as given by

Mr. Howard, a dissimilarity is observed as remarkable as it was unlooked for.

One is immediately induced to suspect that some cause for this discrepancy may be found in the fact of the air of London not becoming cooled during the night; yet what is to be said when this accurate writer states that nearly equal differences exist in that climate, which he is pleased to call the climate of the country of London? By reference to the tables, quoted from in a previous page, it will be seen that while I state the mean difference of temperature between day and night at Exeter to be as great as 30°, he states it to amount in London to not more than 14°.14; and this discrepancy, it will be seen, likewise obtains in the diurnal variation, both of the months and seasons.

I was at first willing to believe that some error existed in the mode of calculating these differences; such, however, has not been found, on re-examination, to be the case. But what makes it still more remarkable is the fact, that while this very slight diurnal variation exists in the metropolis, the monthly mean range is 34°, and the absolute range 96°, exhibiting greater variations than occur in our climate.

Are we, then, to conclude that the temperature of day and night in this district is much less equable than in London or its neighbourhood? and how are we to reconcile the discrepancy between the smallness of the daily range, and the excess of the monthly mean and absolute range?

That these two anomalous conditions of temperature exist, is made evident by actual observation, and, it appears to me their explanation must be

found, not only in the great quantum of heat artificially generated, but also in the dense masses of houses radiating, during the night, the excess of temperature acquired during the day; while the surrounding thick atmosphere is a medium which prevents this taking place so rapidly as when the sky is clear, with the assistance of a free ventilation. The same causes may be adduced to explain why the maximum temperature is arrived at a month later than in this less obstructed district.

As somewhat connected with the subject of temperature, I will add here the relative quantities of sunshine, gleam,* and cloud, as deduced from daily observations made during the eight years from 1829 to 1836 inclusive.

Daily average for the year.

Sunshine.	Gleam.	Cloud.
115.2	78.1	170.6

Daily average for each month in the year.

	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Sunshine ...	7.1	6.6	9.5	12.1	12.5	10.5	11.0	10.6	11.5	9.6	6.5	7.6
Gleam	3.6	4.4	4.8	7.7	9.0	8.1	8.6	10.1	8.1	6.0	5.5	4.2
Cloud	20.2	17.2	16.6	10.1	9.5	11.2	11.3	10.2	11.3	15.3	18.0	19.1

Barometer.—The following results are calculated

* Gleam is understood to be when the disc of the sun is visible through a cloud.

from observations made by Mr. Ponsford, during a period of ten years, from 1825 to 1834, inclusive.

	Exeter.		London.
The mean height	29.87	.....	29.61
Mean of the maximum heights.....	30.34	.....	30.26
..... minimum heights.....	29.35	.....	29.17
Absolute maximum heights	30.90	.....	30.62
..... minimum heights	28.80	.....	28.22

Mean height of different years.

	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834
Exeter	30.5	29.86	29.80	29.97	29.75	29.68	29.77	29.85	29.72	29.85

Mean variation in different years.

	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Exeter	1.80	1.33	1.60	1.85	1.50	1.76	1.55	1.30	1.65	1.56

Mean height in different months.

	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter	29.85	29.91	29.98	29.83	29.87	29.95	29.91	29.92	29.87	29.94	29.86	29.79

Mean range in different months.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter	1.20	1.08	1.11	1.11	0.78	0.66	0.73	0.88	1.01	.98	1.11	1.15
London ...	1.42	1.35	1.29	1.07	0.91	0.83	0.69	0.75	0.89	1.15	1.45	1.45

Extreme range	2.10	.....	2.40
Mean annual range	1.59	.....	1.95
Mean monthly range	.98	.....	1.07
Mean range in winter	1.14	.....	1.40
..... spring	1.00	.....	1.09
..... summer	.75	.....	.75
..... autumn	1.03	.....	1.16

The relations between the barometrical indices of Exeter and London are tolerably regular; in all cases the range being rather greater in the latter place, excepting in the months of April and July, when the range is a trifle greater in the former.

In considering the barometrical observations by themselves, and without reference to other atmospherical phenomena, nothing very peculiar presents itself, with the exception that the range is greatest in winter and least in summer, and that, during the former period, it is at its minimum, and at its maximum in the latter. We may, therefore, infer that when the barometer indicates an elevated pressure, the atmosphere is less liable to change than when the contrary condition obtains.

Dew-point.—The following tables on the dew-point are deduced from a series of observations made during a period of five years, from 1832 to 1836, inclusive.

The mean maximum dew-point, with corresponding mean observations.

	Dew-point.	Barom.	Thermom.	Winds.	Weather.
Exeter	53.6	29.75	56.1	S. and S. W.	Misty and showers.

The mean minimum dew-point, with corresponding mean observations.

	Dew-point.	Barom.	Thermom.	Winds.	Weather.
Exeter	37.2	29.84	44.8	N. and N. E.	Fine.

From the above it will be seen that there is not that attendant variation in atmospheric pressure which might have been expected; the barometer presenting a mean difference of only 0°.11, while the mean range of the dew-point amounts to 16°.4.

In its relations with the conditions of atmospheric temperature, the following laws appear to obtain :— that as the temperature of the dew-point approaches that of the atmosphere, so moisture prevails; and when the relative temperatures are widely separated from each other, a dry state is present.

Mean maximum dew-point for each month, with corresponding observations.

	Dew-point.	Barom.	Thermom.	Wind.	Weather.
January ...	45.0	29.84	46.6	S. W.	Showers.
February..	47.2	29.82	50. 0	S. W.	Showers.
March	47.2	29.81	51.4	S. W.	Showers.
April	49.8	29.56	50.6	S. E.	Rainy.
May	55.0	30.00	59.4	S. E.	Fair.
June	59.8	29.84	62.8	S. E.	Fair.
July	64.0	29.85	68.2	N.	Fair.
August	60.2	29.95	63.8	S. W.	Cloudy.
September	59.4	29.52	61.6	S.	Rainy.
October ...	54.6	29.83	58.0	S.	Showers.
November	52.0	29.56	56.0	S. W.	Showers.
December	49.2	29.63	53.0	W.	Misty.

Mean minimum dew-point, with corresponding observations, for each month.

	Dew-point.	Barom.	Thermom.	Wind.	Weather.
January ...	27.6	29.95	30.6	N. E.	Fair.
February ..	29.6	29.99	34.4	N. W.	Fair.
March	31.4	30.08	38.0	N. E.	Fair.
April	32.2	29.96	42.2	N.	Fair.
May	40.2	29.79	50.8	N. E.	Fair.
June	46.8	29.67	56.4	W.	Fair.
July	48.4	29.98	58.0	N. W.	Fair.
August	46.4	29.88	58.4	N. W.	Fair.
September	42.6	29.80	54.0	N. W.	Fair.
October ...	38.0	29.77	44.4	N.	Fair.
November	30.2	29.97	35.4	N. E.	Fair.
December	31.6	29.86	34.4	N. W.	Fair.

The mean dew-point for each month for five successive years.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
36.3	38.4	39.3	41.5	47.6	53.3	56.2	53.3	51.0	45.3	41.1	40.4

The mean dew-point for each season.

Spring.	Summer.	Autumn.	Winter.
42.8	54.2	45.8	38.3

So that the dew-point is at its minimum in January, and at its maximum in July, the mean range being 19°.9.

The mean range between summer and winter amounts to 15°.9.

Rain.—The western shores of England are necessarily, from their aspect and position as regards the Atlantic, subject to a large share of moisture, and common report has always extended this charge especially to Devonshire.

The quantity of rain that generally falls here has certainly a high average, but Exeter itself may be said to be less open to the charge than the generality of places in the western peninsula; in fact, the city enjoys an advantage over the neighbouring parish of St. Thomas.

Mean annual fall in inches.

Exeter	29.12
St. Thomas	31.90
London	25.00

The means which follow are calculated from the register kept at the Asylum in the parish of St. Thomas, so that the largest average for the district is taken. I calculate from that register, as I think I shall thus better illustrate the climate of the neighbourhood, than by taking the smaller averages yielded by the guage in the city.

Mean quantity of rain in each year for ten years.

	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
St. Thomas	28.72	30.53	33.23	40.31	34.9	32.71	34.88	30.21	35.25	26.65

Mean fall of rain in each month.

	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sep.	Oct.	Nov.	Dec.
St. Thomas	2.9	2.6	2.1	2.5	1.9	2.5	2.2	2.4	3.0	3.1	3.1	3.6
London ...	1.9	1.4	1.2	1.6	1.8	1.9	2.6	2.1	1.9	2.5	2.9	2.4

Mean fall of rain in different seasons.

	Winter.	Spring.	Summer.	Autumn.
St. Thomas	9.1	6.5	7.1	9.2
London	5.8	4.8	6.6	7.4

Number of days on which rain falls in each month.

	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sep.	Oct.	Nov.	Dec.
St. Thomas	12.9	11.8	12.3	12.2	12.3	13.6	13.1	15.0	13.4	14.0	14.5	17.3
London ...	14.	16.	13.	14.	16.	12.	16.	16.	12.	16.	15.	18.

Number of days on which rain falls in each season.

	Winter.	Spring.	Summer.	Autumn.
St. Thomas	42.0	36.8	41.7	41.9
London.....	48.	43.	44.	43.

Average total number of wet days in a year.*

St. Thomas' 162.4
London ..... 178.

Dr. Barham has favoured me with the following results of eight years' observations, which illustrate the character of the dry and rainy days. They were made from the years 1829 to 1836 inclusive. All sunshine constitutes a fine day. Alternate cloud

* A wet day is a day on which a fall takes place, however slight it may be.

and sunshine, without rain, is a fair day; and alternate cloud and sunshine, with rain, is a showery day. The fine, fair, and cloudy days, are dry days; the showery and wet, are wet days.

The average general character of days in the year for eight years.

Fine.	Fair.	Cloudy.	Showery.	Wet.
135.5	51.12	30.6	63.0	76.9

Average general character of the days for each month.

	Fine.	Fair.	Cloudy.	Showery.	Wet.
January	6.1	4.6	7.5	3.9	8.8
February	8.0	4.5	3.1	4.5	8.1
March	9.2	5.9	3.6	6.0	6.2
April	12.9	2.6	1.0	7.5	6.0
May	18.2	4.0	1.5	4.6	2 6
June.....	13.0	3 5	0.8	6.7	5.9
July	15.9	3.6	0.7	7.1	3.6
August.....	15.2	3.5	0 3	6.7	5.1
September	11.3	4.1	0.6	8.5	5.3
October	8.1	5.6	2.7	5.7	7.7
November	6.6	4.0	4.9	4.6	10.0
December	7.9	5.1	4.9	4.0	9.0

Average character of the days for each season.

	Fine.	Fair.	Cloudy.	Showery.	Wet.
Winter.....	22.0	14.2	15.5	12.4	25.2
Spring	40.3	12.5	6.1	18.1	14.8
Summer	44.1	10.6	1.8	20 5	14.6
Autumn	26.0	13.7	8.2	18.8	23.0

From the preceding tables we are surprised to see that though more rain falls in this district than in London, yet that the wet days are considerably fewer in number. The least rainy season is the spring; the autumn is the most so in regard to quantity; but in the winter is the greater number of rainy days. In December is the greatest number of rainy days, and in February are the fewest. Of sunshine, though July and August have a large proportion, yet of all the months May has the greatest share.

Of Frost, Snow, and Sleet.—The mean minimum temperature of November, December, January, February, and March, is below the freezing point; the mean maximum temperature, however, of each of these months is much above that point, so that continued frost is very rare. Occasionally, however, the temperature remains below the freezing point for a period sufficiently long to freeze the river to a state thick enough to sustain large masses of people; this occurs, on an average, every five years. Snow but rarely falls in any great quantity, or remains upon the ground in Exeter and the *immediate* neighbourhood above two or three days: the distant hills are, however, covered frequently for weeks together.

In ten years the number of days on which snow and sleet fell was sixty-nine, which gives the following averaged number of days annually, to which are added the corresponding mean meteorological observations.

Averaged No. of days.	Barom.	Therm.	N. E.	E. S.	S. W.	W. N.
6.9	29.76	31.8	3.1	1.7	.5	1.9

These sixty-nine days of snow and sleet were thus distributed:—

	Jan.	Feb.	Mar.	Apr.	May.	Oct.	Nov.	Dec.
Sixty-nine days' snow	30	15	5	6	1	1	5	6

Hail is scarcely more frequent than snow; the number of days on which it fell during the period of ten years, was seventy-one: the yearly average, with the corresponding atmospheric phenomena, may be thus stated:—

	Yearly Average.	Barom.	Therm.	N. E.	E. S.	S. W.	W. N.
Hail ...	7.1	29.59	4.2	.5	.3	1.7	4.6

These seventy-one days of hail were thus distributed:—

	Jan.	Feb.	Mar.	Apr.	May.	June.	Sep.	Oct.	Nov.	Dec.
Seventy-one days' hail	9	9	7	16	3	1	2	4	5	15

One fact is very worthy of remark, and it is this, that there is almost constantly a change of wind during a hail storm; before the fall of hail the wind is generally from the south-east, which is the coldest, and the change is towards the warmer winds of the south-west and north-west.*

Thunder and Lightning are comparatively infrequent, and very rarely indeed does it happen that the storms are attended by serious or awful occurrences.

In ten years, the number of days in which thunder and lightning have occurred, amounts to but 105. The following table gives the yearly average, with the corresponding observations.

	Yearly Average.	Barom.	Therm.	N. E.	E. S.	S. W.	W. N.
Thunder and lightning..	10.5	29.69	57.1	.7	4.2	3.8	1.8

These one hundred and five days are thus distributed :—

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
One hund. & five days	4	2	4	5	13	16	15	16	10	7	3	10

* S. E. average temperature ... 50.85
S. W. 53.49
N. W. ..... 58.52 Vide postea.

The average number of days for each season is 2.5, occuring in the following proportion :—

	Winter.	Spring.	Summer.	Autumn.
Thunder and lightning...	1.6	2.2	4.7	2.

On the 10th of June, 1826, a thunder-storm vented its fury frightfully near this city; the tower of the neighbouring church of Alphington was struck with the electric fluid, and a boy, then at work upon it, killed upon the spot. Such awful visitations as this are, however, fortunately, very infrequent in this district.

Winds.—We now proceed to examine the condition of the winds in connexion with this district. On a previous occasion, when speaking of the dew point, it was shewn that the south and south-west were the winds attending its maximum, and the north and north-east, those accompanying its minimum point.

We shall first exhibit tables of the winds only as derived from the registers, and then point out their connexion with the variations of temperature, atmospheric pressure, and rain.

Average frequency of each wind in a year.

N.	S.	E.	W.	N. E.	N.W.	S. E.	S. W.
32.8	41.4	29.7	73.7	42.8	57.6	41.4	44.8

Relative frequency of the winds in each month during the space of ten years, i. e. from 1825 *to* 1834.

	N.	E.	S.	W.	N. E.	N. W.	S. E.	S. W.
January	3.8	2.4	3.9	3.8	6.1	5.3	2.8	2.8
February.....	2.2	2.3	1.5	6.9	3.1	4.5	3.6	4.3
March	2.3	1.7	4.0	6.5	4.5	5.6	3.7	2.6
April	4.1	2.9	2.9	5.6	3.4	4.6	4.0	2.3
May	2.1	4.4	3.0	3.7	5.0	4.7	5.5	2.6
June.....	1.9	3.0	1.4	7.4	2.3	5.0	3.7	4.3
July	2.0	4.1	1.6	4.2	3.6	5.2	4.4	3.5
August.....	2.5	3.9	.8	6.4	3.5	4 6	2.4	4.7
September ...	1.9	3.7	3.0	6.5	2.6	4.0	2.9	5.2
October	3 4	5.6	2.4	7.0	1.2	3.5	3.2	4.5
November ...	3.5	2.6	2.2	7.6	3.4	4.8	2.7	3.2
December ...	2.8	3.7	2.1	7.0	4.0	4.4	2.7	4.5

Prevailing wind for each month.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
N.E.	W.	W.	W.	S.E.	W.	N.W	W.	W.	W.	W.	W.

In the above table I have adhered to the eight leading divisions of the compass. Luke Howard, however, prefers including all the winds in four divisions; and for the sake of comparing them with the winds of London I shall now do likewise.

Relative proportion of winds for ten years.

	N. W.—W.	S. W.—S.	S. E.—E.	N. E.—N.
Exeter, 1825–34 ...	131.3	86.2	71.1	75.6
London, 1807–16 ...	100.4	104.4	53.9	74.4

From the preceding tables we may observe that the prevailing winds in this climate are,—first, the west, which blows, on the average, seventy-three days in the year, and then the north-west, which blows fifty-seven; these added together give an average over London of thirty days excess: but then, the south-west wind blows, on the average, eighteen days more in the metropolis than at Exeter; this may in some measure account why they have the greater number of rainy days. The south-easterly winds are, fortunately, the least frequent, both here and in London.

*Average temperature during the several winds.**

N. W.—W.	S. W.—S.	S. E.—E.	N. E.—N.
51.75	53.49	50.85	48.32

Averaged temperature during the several winds in each month for seven years.

	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sep.	Oct.	Nov.	Dec.
N. W.–W...	43.3	43.8	47.0	48.5	56.0	59.0	60.9	61.2	56.1	52.2	47.1	45.9
S. W.–S.	46.3	47.4	47.3	51.7	55.6	60.0	63.7	61.1	58.1	52.4	50.1	48.2
S. E.–E.	37.6	37.0	44.1	49.5	56.4	59.5	66.2	64.1	60.0	52.4	44.5	39.0
N. E.–N. ...	35.3	36.7	40.5	46.7	51.3	61.3	63.8	61.0	55.5	50.0	41.5	36.3

* These observations, which extend over a period of seven years, were only registered when the wind was permanent during the day.

Averaged temperature during the several winds in each season.

	N. W.—W.	S. W.—S.	S. E.—E.	N. E.—N.
Winter	44.3	47.3	40.2	36.1
Spring	47 1	51.5	50.	46.1
Summer	60.3	61.6	63.2	62.0
Autumn	51.8	53.5	52.3	48.0

Average height of the barometer during the different winds.

N. W.—W.	S. W.—S.	S. E.—E.	N. E.—N.
29.73	29.64	29.84	29.85

From the above tables it will be seen that the barometer is at the highest during the north-east and north winds, and at the lowest during the south-west and south winds. The thermometer is at its maximum average during the south and south-east wind, and at its minimum during the north-east. But it is worthy of remark, that this last wind, which has the least elevated temperature during the winter months, becomes the warmest in June.

By reference to Appendix, No. 3, as well as to the previous tables, we observe that the dry winds are those ranging from the south to the north, including the east and its variations; while those winds which are attended by rain, blow from the south to the north, including the west and its variations. The greater prevalence of these latter winds sufficiently accounts for the quantity of rain that falls.

During the winter season the south-west wind is frequently accompanied by a warm thick mist, which has a peculiar relaxing softness in its feel, and is not unaptly styled the true Devonshire weather. These winds, traversing the great mass of the Atlantic from the warmer latitudes, reach this coast overcharged with a greater quantity of moisture than the air can contain when cooled by the lower temperature of the local climate; the result is, the misty appearance of a great dew deposit. A similar phenomenon in summer attends, not infrequently, the south-east wind: in this case the wind comes parched and heated from the Arabian desert, saturates its capacity for moisture with the waters both of the Mediterranean and of the English Channel, and deposits them again upon our coast, thus refreshing it with its dews.

The effect that the winds have in producing cloud may be estimated by the following table, which gives the yearly average of a diurnal observation, with the character of the weather at the period when registered.

	Sunshine.	Gleam.	Cloud.	Dry.	Wet.
N. W.	43.	36.	55.	124.	10.
S. W.	13.3	17.1	53.	66.3	16.1
S. E.	27.	13.	37.	69.	8.
N. E.	32.	13.	27.	68.	3.5

Exeter, in common with the rest of England, is occasionally visited by storms and gales. Those of peculiar violence since my residence here, are—A very violent storm of wind, from the west, on the 20th of February, 1833, when elm and other trees

were torn up by the roots in all directions; it commenced at about six in the morning, and continued till noon:—another during the night of the 28th of March, 1836, which wrecked many vessels on our western coast;—and the hurricane of the 29th of November of the same year. At eight o'clock in the morning the sky became clouded, and some drizzling rain fell; about nine, a brisk wind arose from the south-west, the barometer falling to 28.50, which quickly increased to a force of frightful power,—trees were torn up; houses unroofed; masses of lead were rolled from their places like sheets of paper, and carried to the distance of many yards; slates and portions of building materials fell in all directions like hail;—nothing could exceed the dreary character of the atmosphere during this period. Shortly after ten o'clock the hurricane subsided, the clouds were dissipated, the clear blue sky being only here and there traversed by long flowing tail-shaped clouds. The aspect which the sky now presented was serene and quiet; the air became warm and pleasant in the extreme, and, but for the universal scene of devastation around, nothing indicated the convulsion that had so lately taken place.

This hurricane, according to the best calculations I could make, passed over Exeter (during the period of its greatest violence,) at the rate of eighty miles in the hour.

By way of illustrating some of the more unusual conditions of the climate, it may not be uninteresting to add the following list, which points out some of the rarer variations in the barometer and thermometer, with the corresponding climaterial phenomena.

Year.	Month.	Barom:	Therm.	Wind.	Observations.
1821	Jan. 23	30.65	...	E.	
1822	Feb. 27	30.64	...	N.	
1823	May 6	30.81	...	S.	
——	Oct. 1	28.82	...	N.	
1824	Jan. 18	30.55	35	N.	Water high.
——	Nov. 23	28.09	48	S. W.	Violent storm, and the highest tide ever known: numbers of sheep drowned in the marshes: many vessels wrecked.
1825	Jan. 10	30.85	37	N.	
——	July 19	30.10	95	E.	Thermometer 132 in the sun.
——	Aug. 27	29.94	62	E.	Twelve hours soft rain, the first, except slight showers, since May.
1826	June 10	29.97	74	E.	Violent thunder-storm.
——	July 31	29.97	85	W.	Thunder-storm, rain for about an hour: very little rain since April 12. The wheat harvest nearly finished: no grass or turnips.
——	Aug. 3	29.94	79	E.	Violent thunder-storm from half-past two to four; more rain in this hour and a half than has fallen in 24 hours for many years.
——	Dec. 28	30.50	38	E.	
1827	Feb. 2 to Feb. 25	30.40	...	N. E.	The navigation stopped by ice; fine thaw on the 26th.
——	Dec. 28	30.54	41	E.	
1828	Jan. 18	29.98	56	W.S.W.	Boys bathing, birds singing.
——	Aug. 19	30.10	70	N. W.	The first day without rain since July 8th. (A wet summer and bad harvest.)
——	Sep. 16	30.40	45	N. E.	
1829	Jan. 25	29.41	12	N. E.	
——	Jan. 26	28.80	36	S. W.	
——	Dec. 31	30.44	26	N. E.	
1830	Jan. 1	30.56	14	N. E.	
——	Dec. 6	28.65	49	S. E.	
1831	Jan. 7	30.53	29	N. E.	
1833	Jan. 4	30.50	38	E.	
——	Feb. 20	29.00	39	W.	Violent gale of wind.
——	Dec. 30	29.90	53	W.	Birds singing as it were spring.
1834	Jan. 2	30.34	45	N. W.	Birds singing as it were spring.
——	Oct. 20	30.58	48	S. W.	
——	Dec. 31	30.30	54	S. W.	The springs have not been so low for eighty years.
1835	Jan. 2	30.72	35	N.	Many wells dry, never known so before.
——	Aug. 17	30.20	82	E.	
——	Aug. 20	29.90	86	S. E.	
1836	Mar. 28	28.45	...	N.	Gales of wind all night.
——	Nov. 29	28.50	...	W.	Violent hurricane.
1837	Jan. 1	30.50	...	N. E.	
——	Mar. 25	29.80	19	N.	Ground covered with snow the last three days: frost every night till April 20.

I have now given as full a statistical report of the climate as my resources and time will permit; before quitting the subject altogether, however, it may not be inapplicable to make a few general observations. In the above tables the climate of Exeter has alone been illustrated; it is therefore necessary to observe, that in the neighbourhood which is included in this district very great variety exists. The most cursory view of the map accompanying this paper, will at once point out why such may be the case in reference to towns not far distant, situated on the sea-coast; and position as regards the hills will sufficiently account for it in other instances. I do not, however, purpose entering more upon this subject at present, further than to mention that such is the fact, hoping at a future opportunity to be enabled to furnish some positive evidence in illustration of its being so.

Though rain is frequent in Exeter, and falls in large quantities, it *very rarely* occurs that there is a day of such constant rain but what two or three hours are sufficiently fine for out-door exercise.

For the most part the air is warm, mild, and soft in its character; it is felt especially to be so during the autumn and winter months.

Dr. Forbes, by way of illustrating the mildness of the climate of the Landsend, has given a list of the more tender exotics which live there in the open air: that which I am enabled to supply, will be found nearly as full. The myrtle is luxuriant in the extreme, and forms not unfrequently an ornamental shrub to the cottage of the labourer.

The following is a list furnished me by my friend, Mr. Thomas Dunston.

Coronilla glauca.—South wall; in full flower last Christmas.
Hydrangea hortensis.—Open garden.
Verbena triphylla.—South wall; killed to the ground every winter. At the Rectory House, against an east wall, it endures.
Amaryllis Belladonna.—South wall; will not flower after a wet summer.
Nerina undulata.—Open garden; has not yet flowered.
Azalea Indica, var. *albiflora.*—Open garden; very much injured.
Buddlea globosa.—Open garden; quite hardy.
Chysanthemum Indicum.—Open garden; quite hardy.
Cheiranthus tristis.—Ditto ditto.
Eucomis punctata.—Ditto, blows very late in the season.
Fuchsia Thomsoniana.—Ditto, killed to the ground every winter.
——— *virgata.*—Ditto ditto.
——— *macrostemma.*—Ditto ditto.
——— *thymifolia.*—Ditto.
Hemerocallis Japonica.—Ditto, does not flower; but I have seen it in blossom, in the open air, at Budleigh Salterton.
Salvia angustifolia.—Open garden; perfectly hardy.
Edwardsia microphylla.—Open garden; has not yet flowered.
Apios tuberosa.—Verandah, south aspect; killed to the ground every winter.
Acacia armata.—Open garden; much injured.
Commelina cœlestis.—Open garden; quite hardy.
Ceanothus azareus.—Wall, west aspect; has not yet flowered.
Gazania rigens.—Open garden; quite hardy.
Photinia serrulata.—Open garden; has not yet flowered.
Gladiolus psittacinus.—Lived through last winter in the open ground at Mount Radford nursery, and flowered strongly this autumn.

Mimulus cardinalis.—Lived through last winter in the open garden at Winslade; as also the

Verbena Melindres.

There are large plants of several varieties of the *Camellia Japonica* in the open garden at Powderham, which produce a profusion of blossoms.

To these I may add the following list, furnished me by Mr. Pince, which endure in the open air in his garden in St. Thomas'.

Erythrina laurifolia.
Eriobotrya Japonica.
Laurus Camphora.
Camellia Japonica.—In all its varieties.
Camellia reticulata.
Thea viridis.
—— *Bohea.*
Magnolia fuscata, var. *Exoniensis.*
Arundo Donax.
Agave Americana.
Passiflora Brasiliensis.
Linum trigynum.
Illicium Floridanum.
Myrtus communis.
Punica Granatum.
Citrus medica.
——— *Limonum.*
——— *acida.*
——— *Aurantium.*
Olea Europæa.
Gladiolus cardinalis—Under south wall.
Alstræmeria.—Varieties.
Ixia.—Varieties.
Metrosideros saligna.

The market of Exeter is supplied with the best sorts of vegetables, and in the greatest abundance; cabbages are produced by the beginning of April, and of some of the early kinds of brocoli a few heads are produced at Christmas,—the principal crop, however, does not come in till February or the beginning of March.

Potatoes are frequently brought to market in the beginning and middle of May, but this is here considered very early; they are not produced in any

great quantities until June. Turnips are in good table order by May.

Mulberries are here a fine fruit, and occur in abundant crops: this year, 1837, they are rather backward, the wet and cold of August having greatly prevented their ripening.

Walnut-trees of very good kinds bear well, as do also the filbert. These latter, however, are not of a good kind, being very apt to deteriorate into the cob-nut, which occurs in great abundance in this county. There can be no doubt that this is caused by the pollen from the cob-nut impregnating the pistils of the filbert.

Nectarines, apricots, and peaches, in good aspects, produce fine crops, the fruit being large and well flavoured. Plum-trees against walls produce fruit of very fine flavour; but standards, in open gardens, are, in this respect, very precarious.

It is generally thought that there is something very obnoxious in this climate to the damson, and Devonshire people constantly affirm that this tree will not thrive in the county: this, however, is certainly not the fact, as there are some very fine trees, which produce good fruit, in the immediate neighbourhood.

The apple-tree, generally speaking, bears abundantly; there are, indeed, a few exceptions but which may probably be traced to the trees being worn out, or to the orchards being badly managed. The best late dessert apples in cultivation are the Cornish Gilliflower, the Old Nonpareil, the Old Golden Pippin, and the Ross Nonpareil. These two last are in perfection from the beginning of

November to Christmas; the Cornish Gilliflower from the middle of November to Christmas; and the Old Nonpareil from Christmas to Lady-day. The earliest dessert apples are the Irish Peach, Early Margaret, and Jeanetin, which, in favourable seasons, are ripe in July.

The pear-trees to be depended upon for producing a regular crop, as standards, are the Citron des Carmes, Jargonelle, White Doyenne, Beurre de Capiaumont, Napoleon, Chaumontelle, Bishop's Thumb, Glout Morceau, Swan's Egg, Windsor, Catillac, together with several others; in fact, a very great variety of pear-trees thrive well in this district, producing a thoroughly ripe and delicious fruit. It is, however, remarkable that this fruit thrives but indifferently at Honiton, which lies sixteen miles to the south-east of Exeter in an elevated position, and is generally from ten days to a fortnight behind Exeter in all the productions of the garden. Apples thrive well, but, even with the greatest care, very little wall fruit can be obtained.

The seasons, however, vary very considerably; asparagus, which is the surest test of temperature, has been gathered in Exeter as early as the 16th of March, while in the present year it could not be cut until the beginning of May.

With regard to trees, I believe little need be said, than that all the British species thrive exceedingly well. The cypress and the cedar arrive at great heights, and the whole district is studded with elms, oaks, ilices, and firs, which grow in the greatest luxuriance.

NATURAL PRODUCTIONS.

Having now illustrated the physical condition of the climate of the district, it is necessary, in accordance with the purport of this paper, to say some little in reference to the natural productions. I shall not, however, prolong the paper with more than a hasty glance at the more prominent and interesting objects,—referring to the lists in the Appendix, No. 4, for the more detailed accounts.

Zoology.—Of horned cattle a great variety are bred in this district; but the most interesting, as belonging peculiarly to this county, are the Devon cow and steer. They are considered by agriculturists as particularly valuable, and are much sought after in distant counties. The full-sized North Devon cow, when fattened to its frame, will not exceed eight score per quarter; and the ordinary average of its ox, at five years old, and equally well fattened, must not be rated higher than three score per quarter above the weight of its fattened mother. The meat is close-grained and very excellent. The milch cows are kept throughout the year in the open fields, their milk being considered better under these circumstances. The average quantity of milk supplied daily by the red Devon cow is about eight ale quarts; and five quarts of this milk yield eight ounces and a half of butter, and two pounds nine ounces of pressed cheese and curd.

The sheep of Dartmoor, affording what is commonly called the Ockington or Okehampton mutton, are of very small size. Their flesh is much esteemed; it is dark coloured, peculiarly close grained, and

yields, on cooking, a deep rich modena red gravy; it has much of the shortness and flavour of venison. The other sheep, natives of Devon, are the horned Exmoor, the South Devon, and Bampton Notts.

The Dartmoor ponies, which run wild on this vast waste, are very celebrated. Their appearance is unsightly, but then, they are sure-footed, hardy, and in every way calculated for traversing the hills of this county. The well-known Devonshire pack-horse is a larger variety of this pony. It is not many years since the parish roads generally in Devon were almost inaccessible to wheels, (in truth this is still the case in some parts of the county,) wherefore all farm produce was conveyed on the backs of this species of horse. They almost always traversed the roads loose, and in parties of different numbers. By general consent, one horse was ever permitted to be the leader; him they closely followed, at a rapid pace, up and down the shingly hills, or occupying, with their unsightly packs, *Devonice* crooks,* nearly the whole width of the road.

By reference to the Appendix it will be seen that the birds of this district are numerous,—few, indeed, which are in estimation for the table are wanting. Though there is a sufficient plenty of game of all descriptions, yet the smallness of the enclosures does not afford that cover for the very immense quantity which is found in the more northern counties.

In the winter season numerous species of the duck

* A good description of the crooks is given in the volume called *The Horse*, published by the Society for the Diffusion of Useful Knowledge. p. 59.

tribe are frequently seen. The wild swan, *Anas Cygnus,* is only an occasional visitor; amongst a number of these which visited the county in the winter of 1830, were some of the *Anas Bewickii;* a specimen of this variety, killed at that time, I have in my possession.

The nightingale has not generally been supposed to frequent Devonshire; for some few years past, however, it has been heard about a mile and a half to the north of Exeter.

The ornithology of Devon becomes interesting when it is recollected that it was in this county the late Col. Montagu, for the most part, pursued his researches, and that here many of the rare species contributed by him to the British Museum, were shot.

The following few notes on the migratory birds may be interesting.

1826: April 15.—Swallows seen.
1829: May 11.—Flycatcher.
..... Oct. 6.—Woodcocks.
1830: Jan. 16.—Wild swans.
..... Jan. 19.—Wild swans.
..... March 10.—Wild geese.
..... April 9.—Redstart.
..... April 11.—Swallow.
..... April 18.—Cuckoo.
..... May 7.—Flycatcher.
1831: March 19.—Flocks of ducks fly from south to west.
..... April 11.—Swallow and redstart.
1832: April 15.—Swallow.
1832: April 23.—Redstart.
..... April 28.—Cuckoo.
..... May 4.—Flycatcher.
1833: April 3.—Redstart.
..... April 12.—Swallow.
..... April 22.—Cuckoo.
..... May 7.—Flycatcher.
..... June 1.—Swift.
1834: April 16.—Redstart.
..... April 22.—Swallow.
..... April 26.—Cuckoo.
..... May 10.—Flycatcher.
..... May 19.—Swift.
..... Oct. 13.—Seven wild ducks to south-west.

On December 30th, 1833, the barometer being 29.90, thermometer 53°, and the wind westerly,—and on the 2nd of January, 1834, the barometer

being 30.34, thermometer 45°, and the wind north-west,—the woodlarks and thrushes were singing as if it were spring.

Fish, in the greatest abundance, frequent the coast. Opposite to Starcross the oyster beds are very extensive ; the oyster is large and good, though not to be compared with that on the Sussex coast. The hake furnishes to the poor an abundant and cheap food. In the proper seasons the market is amply supplied with cod, turbot, brill, mullet, dory, salmon, trout, bass, whiting, mackerel, herring, sole, crabs, lobsters, shrimps, prawns, cockles, &c.

For the very extensive and complete list of fishes found on this coast, I am indebted to Dr. Parnell, who is devoting much time and attention to this branch of natural history. (Vide Appendix.)

The indigenous phænogamous plants of Devonshire amount to about 800. They are well described, and their localities given, in the *Flora Devoniensis,* published by the Rev. J. P. Jones and Mr. Kingston. The latter gentleman has also published in another place* an analysis of the genera, from which it appears that the following are the relative distribution and numbers of the species belonging to each of the principal natural orders.

MONOCOTYLEDONES.

	Species.		Species.
Gramineæ	75	*Aroideæ*	8
Cyperaceæ	48	*Asphodeleæ*	5
Junceæ	16	And referrible to eight other natural orders	13
Orchideæ	13		
Fluviales	10		

* *Cheeke's Edinburgh Journal of Natural and Geographical Science,* June, 1831.

DICOTYLEDONES.

	Species.		Species.
Compositæ	72	*Borragineæ*	13
Cruciferæ	44	*Primulaceæ* and *Lentibulariæ*	13
Leguminosæ	39	*Geraniaceæ* and *Oxalideæ*	14
Umbelliferæ	38	*Rubiaceæ*	11
Rosaceæ and *Pomaceæ*	36	*Hypericineæ*	9
Labiatæ	35	*Sempervivæ*	9
Scrophularineæ and *Orobancheæ*	31	*Solaneæ*	8
Caryophylleæ and *Lineæ*	31	*Euphorbiaceæ*	8
Corylaceæ and *Salicineæ*	28	*Papaveraceæ*	7
Ranunculaceæ	20	And referrible to thirty-nine other orders there are also	113
Polygoneæ	18		
Chenopodeæ	15		

So that the grasses form nearly two-thirds of their own class, and, together with the composite flowers, one-fourth of the whole of our phænogamous plants; whilst the cruciform, leguminous, umbelliferous, rosaceous and labiated, form together one-fourth more. Amongst the plants peculiar to this county the *Chrysocoma Linosyris* and the *Lobelia urens* are remarkable.

Mr. Kingston makes the observation, that the *Primula Veris* and the *Campanula rotundifolia*, of common occurrence in the adjoining counties, are but rarely met with in this district. *Erica vagans* is chiefly restricted to the serpentine formation; *Iris fætidissima* and the elm are frequent on the red sand; the *Cisti*, *Clematis Vitalba*, and *Conyza squarrosa*, on the limestone; and the oak on the schist formation. With these exceptions, and they must not by any means be taken in a strict sense, the distribution of the different species of plants, appears to be quite independent of the various rock strata. The most striking local differences in the character of the flora of the district, will be found in that portion, chiefly composed of granite and schist, which is

elevated and uncultivated, as contrasted with the more sheltered and reclaimed country on the red sand formation.

By way of illustrating the general mildness of the winter climate, the following list of indigenous plants, observed in flower during the months of December 1831, and January 1832, is added:—

	Th.	Wind.	Weather	Names of Plants.	Where found.
				Fragaria vesca	Dunchideock.
				Potentilla Fragaria	Powderham.
				Rosa Indica	Kenton.
1831.				*Lamium album*	Exminster.
Dec. 24	42	N.W.N.	Misty	——— *purpureum*	Kenn.
..... 25	43	E. S. E.	Fair	*Lychnis dioica*	Kenn.
..... 26	38	S. S. E.	Foggy	*Bellis perennis*	Kenton.
..... 27	38	N.	Foggy	*Primula vulgaris*	Alphington.
..... 28	36	N.	Foggy	*Anemone nemorosa*	Kenton.
..... 29	39	N.	Cloudy	*Antirrhinum Cymbalaria*	Kenton.
..... 30	38	N. N. E.	Cloudy	*Viola tricolor*	Kenton.
..... 31	32	N. N. E.	Fair	—— *canina*	Kenton.
				Narcissus polyanthus	Warren.
				Vinca minor	Kenton.
				——*major*	Kenton.
1832.					
Jan. 1	29	N.	Fair		
..... 2	32	E. N. E.	Fair		
..... 3	32	N.	Cloudy		
..... 4	29	N.	Foggy	*Galanthus nivalis*	Kenn Lane.
..... 5	37	E. S. E.	Fair	*Primula vulgaris*	Dawlishwater.
..... 6	42	E.	Cloudy	*Leontodon Taraxacum*	Oxton.
..... 7	45	E.	Cloudy	*Viola odorata*	Powderham.
..... 8	42	E.	Cloudy	*Sonchus oleraccus*	Starcross.
..... 9	44	S. E.	Rainy	*Potentilla Fragaria*	Kenton.
..... 10	48	S.	Cloudy	*Vicia sylvatica*	Dunchideock.
..... 11	48	S.	Showers	*Thlaspi Bursa-pastoris*	Kenton.
..... 12	44	S.	Showers	*Ranunculus Ficaria*	Kenton.
..... 13	40	W.N.W.	Showers	——— *repens*	Eastdon.
..... 14	32	N.	Fair	*Fumaria capreolata*	Powderham.
..... 15	34	N.	Foggy	*Lamium album*	Powderham.
..... 16	37	N.	Foggy	——— *purpureum*	Powderham.
..... 17	36	N.	Foggy	*Viola odorata*	Powderham.
..... 18	40	N. W.	Cloudy	*Urtica urens*	Powderham.
..... 19	41	E.	Cloudy	*Poa annua*	Mamhead.
..... 20	44	S.	Cloudy	*Avena fatua*	Powderham.
..... 21	46	S. E.	Misty	*Heracleum angustifolium*	Kenton.
..... 22	46	S. E.	Rain	*Stellaria holostea*	Shillingford.
..... 23	45	S. E.	Cloudy	——— *media*	Kenn.
..... 24	44	S.	Cloudy	*Lychnis dioica*	Kenton.
..... 25	42	W.	Fair	*Chrysanthemum Leucanth.*	Kenton.
..... 26	36	W.	Foggy	*Matricaria Chamomilla*	Kenton.
..... 27	38	N.	Fair	*Senecio Jacobæa*	Kenton.
..... 28	33	N. W.	Cloudy	—— *vulgaris*	Kenton.
..... 29	45	N. W.	Fair		
..... 30	41	W.	Cloudy		
..... 31	41	W.	Cloudy		

With this we finish the very slight sketch of the natural productions of the district. Some further details upon these matters are added in the Appendix. In the above I have endeavoured to refer to those productions only, which, from being used as food, or as illustrating climate, bear some reference to the public health.

We shall now proceed to the next division of our paper, viz :—

THE CIVIL AND ECONOMICAL HISTORY OF THE DISTRICT.

Under this head is involved a consideration of those external influences, the source of which is consequent to the social condition. Hitherto, in considering the physical character of the district, we have referred to influences, which, for the most part, are fixed, and not within the power of the inhabitants to alter. We have now to regard those circumstances which have an almost inevitable, rather than an accidental existence, in the congregating together of masses of men. Though these are, in great measure, capable of being controlled and modified, yet their constancy is ever sufficiently marked to give them great importance in any question involving public health.

The statement of the number and condition of the inhabitants presents itself naturally as the first point to be ascertained. In the city of Exeter, together with the adjoining parishes of Alphington, St. Leonard's, and Heavitree, we find that the total population in the year 1831 amounted to 31,877, who are members of 6,759 families—thus giving,

on the average, nearly four and a half (4.4) individuals as the number composing each family. Of these 6,759 families there are employed—

Firstly.—In agriculture	290
Secondly.—In trade, manufacture, handicraft, &c.	3,119
Thirdly.—Not included in either of the above divisions	3,350

The females are rather in excess of the males, there being—

Of males	14,285
Of females	17,592

The agricultural population, notwithstanding the city is situated in the midst of a fertile and highly-cultivated country, forms but a very small proportion of the whole, amounting to but 339 individuals. In fact, were we to exclude the above-named adjoining parishes, there would remain only the very limited number of 156 persons of this class residing within the city; while those employed in handicraft, trades, and manufactures, amount to the much greater number of 3,847.

From the above we see that the agricultural portion forms only one ninety-fourth part of the whole population, while rather more than one-sixth are engaged in trade and handicraft.

The following is a summary statement of the condition of the whole population :—

Males	14,285
Females	17,592
Males twenty years of age and upwards	7,382
Agricultural occupiers employing labourers	59
Agricultural occupiers not employing labourers	60
Labourers employed in agriculture	339

Persons employed in manufacture and making machinery	59
Persons employed in retail trade and handicraft, as masters or workmen	3,788
Capitalists, bankers, professional and other educated men	686
Labourers employed in labour, not agricultural	1,370
Other males, twenty years of age, not servants	735
Male servants above twenty years of age	286
Male servants below twenty years of age	68
Female servants	2,215

Occupations.—I am not aware that there are any peculiarities in the occupations of the labouring classes worth dwelling on. These people are subject to the conditions of their class common to such in all large cities.

The serge manufactory, which a few years since, in this district of the West of England, was of very great importance, is now nearly extinct. It has been estimated that the woollen trade, when in its greatest prosperity, engaged eight out of ten amongst the labouring classes in this city, in the various departments of its manufacture; while now there are but a very limited number of men occupied in the few fulling-mills yet at work—so great and rapid has been the decrease in this traffic.

The *Trade* of Exeter now amounts to little else than the importation of those foreign commodities necessary for its own consumption and that of the neighbouring towns. Formerly, it was the great emporium of the thinner kinds of woollen goods, such as serges, druggets, estamines, and long ells, which were spun and woven in the towns around, and then dyed and finished within the city. Thence they were shipped to Holland, and Italy, but more especially to Spain and the East Indies.

Since the introduction of machinery, however, and the greater facilities of obtaining fuel in the North of England, this trade has been, for the most part, removed thither. The chief traffic of the city may be now stated to consist of foreign imports, viz.—wine and spirits, timber, hemp, tallow, hides, valonia, bark, and fruit; and of home goods, a large importation of general merchandize from all the principal ports in the kingdom.

The *Canal* is too importantly connected with the trade of Exeter to be passed over without some notice—it being the only means whereby the trading vessels can arrive at the port of this city.

It was first made in the reign of Elizabeth, and at that time extended only to Countess Weir. In the time of William the Third it was prolonged to the sluice gates, which are a little above Topsham, on the opposite side. The further extension, to its present mouth at Turf was commenced in 1825, and completed in 1829.

In the cutting of this extended portion, the general number of men employed was five hundred.

It is not unworthy of observation here, that frequent and severe cases of ague occurred amongst them, a disease otherwise comparatively unknown in this district.

The canal has now a surface breadth of 100 feet, and a bottom breadth of 34; its depth averages 15 feet, and vessels drawing 14 feet of water easily pass up it. The advantages enjoyed by vessels coming to this port, by the recent alterations, are—a generally improved system of lockage, an increased depth, and its entrance into the river at a part where the channel is more than 14 feet deep.

The effect of these improvements on the trade of Exeter has been very beneficial; it is estimated to be now twice as extensive as it was previous to 1825. The average number of vessels lying at the quays is stated to be twenty. These quays are situated around the sides of a basin, which is connected with the upper part of the Canal, and is 900 feet in length, 120 in breadth, and 15 in depth; as also on the banks of the river, on the same side as the city, where it has a width of 120 feet, and an average depth of nine.

Water-works.—Beside the conduit and the wells referred to in a previous part of this paper*, Exeter is plentifully supplied with water from a large reservoir of recent construction, situated in a very beautiful spot, to the north of the city, known by the name of "Danes Castle Field." It is kept filled with river water, taken from a mill leat, two miles above the city, and therefore free from any adventitious impurities. The qualities and chemical composition of this water have already been given.

The forcing works are remarkable for simplicity and power. The engine, which is worked by a breast-wheel, is of 23-horse power; it has 3 pumps, each of which gives 18 strokes in a minute. The water thus delivered in this space of time at the reservoir is 37 cubic feet, or 438 gallons.

The reservoir contains 2,140,000 gallons, and is 168 feet above high-water mark; but the water can be raised by the stand pipe to the further height of 180 feet, which is more than 30 feet above any part of the city. This stand pipe is 150 feet above the level of the river at Pynes Weir.

* Vide p. 148.

Houses.—The number of inhabited houses in Exeter amounts to 4,703, which are occupied by 6,759 families. Besides these, there are 115 now building, and 324 which are uninhabited. These houses are by no means uniform; many which are situated in the western quarter of the town are built firmly of the red conglomerate rock, and of trap; they were formerly the residence of the opulent merchants; now the spacious rooms are separately tenanted by the families of the poor. The great mass of the modern houses are built of brick, which in no way differ from the generality of houses erecting throughout England.

In the immediate neighbourhood are many houses the walls of which are composed of *cob*. As this is a mode of house-building peculiar to what is provincially termed the West of England, I shall here describe it.*

The walls are composed of earth and straw mixed up with water like mortar, and then well beaten and trodden together. This mixture is always laid upon a foundation of stone-work—it being necessary to keep it dry: hence the Devonshire adage, that "All cob wants, is a good hat and a good pair of shoes." The cob mixture is laid on in layers, generally from two to four feet in depth; it is essential that each separate layer should be allowed some weeks to settle, and it is then pared perpendicularly even, before another is added. When the successive layers form a wall of sufficient height, it

* Vide *Quarterly Review*, No. 116, p. 524. Where Mr. Richard Ford has elaborately explained both the process and antiquity of cob building.

is surmounted by thatch. Some months after the walls are quite finished, and supposed to be dry, they are plastered, white-washed, or rough-cast, which, provincially, is called *slap-dash*.

These houses are warm in winter and cool in summer; in fact, are well suited to the climate, and in every respect, more comfortable than all other buildings. This mode of building is much cheaper than houses of stone or brick, and, if kept dry, is very durable. A cob cottage forms a picturesque object in the landscapes of Devon, grown over, as it generally is, by myrtle and other flowers.

The houses of more special interest in a paper on medical topography, are those devoted to the purposes of affording relief to the sick poor. In Exeter they are the Hospital, the Dispensary, the Eye Infirmary, the Asylum, the Penitentiary, and the Workhouse. The purposes and capabilities of these institutions, however, may be more aptly noticed in a subsequent portion of this paper, which will be especially devoted to the subject of medical statistics.

Fuel.—On this head little need be said. That which the neighbourhood alone affords, viz. wood, is too expensive for general use. Coals, which are imported both from the North of England and from Wales, may be said to be almost the only fuel consumed in this city. In the houses of the poorer people, tan is occasionally burnt; but the unpleasantness of its smell quite precludes its use elsewhere.

Dress.—The clothing of the inhabitants presents nothing remarkable. That of the upper classes varies with the general fashions of the day, while that

of the poorer is much the same as is met with in all large towns, varying from every degree of comfort, to the lowest degree of squalid misery.

Diet.—With the exception of a few articles, there is nothing very peculiar to be noted under this head. Amongst the opulent, the various good things for which Devonshire is famed are indiscriminately used. The diet of the poorer classes consists, for the most part, of milk, potatoes, *fine* bread, and butter,—coarse bread is but seldom eaten. The Sunday meal is generally gladdened by baked meat, otherwise they consume but little animal food. Hake is a favourite fish amongst them, though little can be said in its praise, except the positive qualities of its being wholesome and cheap. It is soft, woolly, and insipid. The most usual way of cooking it, after cutting it into junks, is to bake it, with the addition of some fat, in large oval flat dishes.

The beverage in common use is cider. It is drunk throughout Devonshire in a very different condition to what it is met with elsewhere. The cider which is sold in London and other places, as imported from Devonshire, is sweet, with some flavour of the apple, and very poor in body; while that which is preferred for home consumption is of a light colour, and has somewhat of a rough taste. The old cider drinker has no objection to its being a little hard, *anglicè* sour. The Devonshire labourer will call that a good cider which is full in body, rough in taste, and hard, and has no flavour of the apple remaining in it. The sweetness of the cider prepared for exportation is preserved by a process to which it is submitted during its manufacture, and

which, throughout the county, is known by the term "Matching."

The process of making cider is very simple. In the autumn the apples are collected into heaps in the open air, and allowed to *sweat*, or pass into a state of fermentation, and thereby become mellowed. Such of these as become black-rotten, are, or should be, thrown aside; the remainder are put into the cider press, and the resulting fluid is known and sold under the name of "cider from the pound's mouth." This is immediately put into a large vat, in which it is allowed to remain until a head has risen. This takes place in one, two, or three days, according to the state of the atmosphere. It is then drawn off, and put into pipes or hogsheads, and permitted to ferment. As often as the cider rises to a head, or there is a generation of fixed air, so often is it racked into a fresh cask.* It usually requires racking three or four times, but in very warm weather seven or eight times. Be this as it may, when the juice no longer ferments and remains fine, the process of vinification is complete, and the cider is made. It is now fit for immediate use, though it is generally esteemed better to keep it for a month or two. During the hay and corn harvests each labourer

* A practical cider manufacturer tells me that instead of racking it frequently, according to the old method, the plan he pursued last year was to put in the bung immediately, and insert into the head of the cask a siphon, one extremity of which passed into a cup of water; thus the foul air escaped in bubbles through the water, and the cider was not exposed to the atmosphere. After the fermentation had ceased, the cider was racked, again using the siphon to secure the cask from any second fermentation; when this was all quiet, the siphon was removed, the aperture closed, and in the following March the cider was racked for the last time.

employed is allowed, on an average, a gallon of this cider a day.

In the above description, the plain old mode of manufacture is described; but for the sake of producing ciders of a peculiarly sweet taste, or for exportation, *matching* or some other means of checking fermentation is resorted to. It is remarkable that an *un-matched* cider will not bear water carriage of the shortest distance, nor will it sustain for any length of time (in the cask) a continued motion.*

Matching cider is thus accomplished:—After it has been removed from the vat into the cask, as previously described, it is suffered to remain there until it has formed a head, or shows a disposition to ferment; a small quantity of the juice (say a gallon) is drawn off into an empty cask, and while a sulphur match is being burnt within the bung-hole, this juice is agitated round the sides of the cask,—the remainder is then added. This process is repeated in a fresh cask as often as it shows a tendency to ferment. In cold or still weather two matchings are sufficient; but when the weather is hot and windy, it may require to be done four or five times. This process, by checking fermentation, and thus preventing vinification from proceeding too fast, produces the sweet fluid, in which the flavour of the fruit is retained. This cider, although it does not contain so much alcohol as that made by the process previously described, and is at first very

* This is the general and prevailing idea amongst all practical cider manufacturers in the county; but I have lately been assured that unmatched cider has been sent without injury by water carriage to London.

sweet, raw, and tastes of the apple, predisposing those who may drink it to griping pains and diarrhœa, yet, at the end of three or four months, becomes a palatable and wholesome liquor. To those who are not cider drinkers, in the Devonshire acceptation of the term, it is much more palatable than the cider in which the processes of fermentation have not been checked.

After racking there remain dregs which are deposited during the fermentation. These were formerly collected and distilled, thus yielding a coarse ardent spirit, vulgarly called "still-spirits." This spirit is now scarcely ever made, in consequence of the present improved mode of straining and fining the dregs, by which means all that was available for this purpose is converted into cider.

Cider is frequently observed to lose its colour, and turn black, especially after exposure to the air, which induces those who are unacquainted with this property, to ascribe it to some adulteration practised by the manufacturer. This, however, is not the fact. It is rather to be referred to the natural tendency which apple juice has, when exposed to the air, to become black; and that it is owing to this, is further proved from the circumstance of the richest cider most quickly undergoing this change.

The Colica Pictonum or Devonshire colic, which some years since so generally prevailed throughout this county, has been traced to the existence of lead in the cider, derived from the basins then used in the cider presses, which were formerly of lead. This mischievous part of the *pound* is now almost universally exploded, and in their place wooden ones are

substituted; so that the inhabitants of Devonshire are now not more subject to this disease than those of other counties.

Devonshire *clouted*, or *clotted* cream, is made in the following manner. The milk is allowed to remain from twelve to twenty-four hours in tin or other pans, capable of holding two or more gallons, which are then placed on a very slow fire, and allowed to remain there for an hour and a half, or we should rather say, until a yellow rim is formed, and some bubbles begin to make their appearance. It must by no means be allowed to boil, or the whole will be spoiled. It is now removed from the fire, and is again allowed to remain twelve or twenty-four hours to cool, during which time the head is forming, which may be then taken off, as fit for use.

In good milk seasons two gallons of milk are calculated to produce one pound of cream. This cream is beautifully white, thick, soft, deliciously cool, and less greasy than the raw cream. I am inclined to esteem the former by far the more wholesome, standing much in the same relation to the latter, as the raw milk does to the scalded.

The usual method of making butter throughout Devonshire, is by churning the clouted cream; it is not made from the raw cream, as is the custom in other counties. Butter so made is preferable, as keeping longer, and is further esteemed as being freer from any adventitious flavour of pasturage, which is not unfrequently retained in the more general mode.

One pound and a half of cream is estimated to

yield one pound of butter, leaving a residue of half a pint of very rich buttermilk. The general arrangement of the dairy consists in preserving cleanliness, by daily washing and scalding the utensils used; and, in hot weather, lowering the temperature by the sprinkling of cold water.

Occupations and Amusements.—Under these heads little need be said. The only amusement generally indulged in, the mode of which is almost peculiar to the county, is that of wrestling. It differs much from the sport so called and practised in Cornwall and the North of England, inasmuch as the cruelty of kicking the shin is permitted; a custom which is very prolific of obstinate ulcered legs in after years. The account given by Vancouver of this sport, is so characteristic, that I transcribe it in a note at the foot of this page.*

* "The athletic exercise to which these people are mostly addicted is that of wrestling. This is pursued with great fervour and emulation by the young farmers and peasantry in the country. It is common, on these occasions, for a purse of six, eight, or ten guineas to be made by gentlemen fond of promoting this play, and a day is appointed for its being wrestled for, generally near some large village or market-town. The lists are prepared by a ring, formed with stakes and a single rope, from fifteen to twenty yards in diameter, and in which it will appear that the winner of the purse must toss or throw down five of his adversaries; there seems to be no regulation with regard to the hold they take of each other,—the collar, arm, or any part above the waistband that most conveniently presents to the combatants during the contest, which sometimes continues from ten to fifteen minutes, and in which is displayed much activity, strength, and adroitness; whilst the shins of the party are often found streaming with blood, from the sharp and violent blows they receive from each other, but which on no account are ever permitted to be given above the knee.—The usual form is to shake hands before and after the contest, and it rarely happens that the play is followed with boxing, or that any grudge or

Moral and intellectual condition.—The moral condition of the upper classes is much the same as that which is usually found when the character is softened down by education and the forms of polished society. The more prominent and active virtue of this class is benevolence—this is especially evinced in the number and extent of endowment of the local charities; ancient records and modern acts both testify to this. The besetting sin is political animosity, which is too frequently carried into the private relations of life. In common with the rest of England, a few years since, the pleasures of the festive board were carried to great excess: happily, the tone of the present day prevails here, and the good cheer, which is hospitably afforded, is enjoyed now in cheerful moderation.

Amongst the lower orders there is much kindly

ill-will is continued from the conquered to those that may have thrown them. The play generally begins between two and three o'clock in the afternoon, and so well matched are the combatants, that the victor is frequently not declared till after midnight, in which case the ring is properly lighted, and the same precautions are continued during the whole time, to secure fair and prevent foul play. The Moor-men are celebrated for their hardiness, in bearing excessive kicking upon their shins. The ill effects which might be expected to result from such violence, is very soon carried off by their excellent habit of body, and the peculiar temperament of their constitutions. In the outset of the play, every man who becomes a standard for the purse, must first throw two men on their back, belly, or side; eight of these standards must be made from the primary competitors for the single play, and when the standards are thus made, they each receive a crown. These eight playing, four of them must fall; the other four then engage, two of whom must fall; when the still standing two enter to decide the purse, and the second best man, or he who is last thrown, usually receives about one in five upon its amount. Three tryers or conductors of the lists are appointed, who decide all disputes immediately and without appeal."

feeling evinced towards each other. My own observation has shown me that they are ever ready to sacrifice their time and goods to succour their sick friends, and to afford unconditional assistance, which might be looked for in vain among the more wealthy. The prevailing vices are drunkenness and a too free intercourse of the sexes. I have been frequently assured, by the local authorities, that this latter vice obtains to a most heartless and wretched extent.

The intellectual condition of Exeter is rather passive than active; though it has given to the world some eminent names, these people are, for the most part, rather satisfied to enjoy the literary labours of others, in the seclusion of their own chambers, than to enter themselves amongst the competitors for fame in the arduous arena of letters. It should appear that they are rather bookmen, than original observers; and this may account why the city has been so prolific in giving eminent lawyers to their country, in preference to individuals eminent in the walks of other professions. Amongst recent examples as illustrative of this, we may quote the well known names of Lord Chancellor King, Lord Gifford, and Sir W. W. Follett.

The intellectual capacity of the lower orders is above mediocrity; they are intelligent and observant, and by far the greater portion can read and write.

PART II.—STATISTICAL AND MEDICAL.

Statistics.—Having taken a review of many of those local, physical, and moral circumstances, which may be supposed to exert an influence upon the public health, and which thus assist in determining the duration of life, it may not be irrelevant to place in apposition with the foregoing observations the actual mortality which has occurred during the same period.

As this paper has already occupied so much of the present volume of the Society's *Transactions*, I shall forego entering further into the subject of statistics than is strictly illustrative of the effect of climate, deferring, until another opportunity, the particular discussion of the general law of mortality as applicable to Exeter, when I also hope to furnish that concluding portion of this paper which is more strictly devoted to the Medical History of the district.

The tables that follow, are the result of very careful and elaborate examinations of the different parish registers. They are here given in order that the data from whence the average mortality has been adduced may be examined, as well as being useful by way of offering occasion for particular remark. The tables are divided into two series,—one including the town parishes,* in which the

* The first series includes the undermentioned twenty-one parishes:—St. Paul, St. Olave, Allhallows (Goldsmith Street), St. Edmund, St. Kerian, St. Mary Arches, St. Mary Major, St. Martin, St. Petrock, The Holy Trinity, Allhallows (on the walls), St. Sidwell, St. George, St. Pancras, Precinct of the Close, St. David, St. Thomas, St. John, St. Mary Steps, St. Lawrence, St. Stephen.

population is essentially the inhabitants of a city,—and the other the country parishes,* in which, though attached to Exeter, the population is, for the most part, resident in the country, and, therefore, not subjected to the same influences as those dwelling in a city.

Town Parishes.—The gross amount of deaths which have occurred in ten years (i.e. from 1825 to 1834 inclusive,) in the twenty-one town parishes of Exeter is 7362; 3813 of which are males, and 3549 are females.

Table 1.—*The distribution of these* 7362 *deaths, according to their several ages in each year, for the ten years from* 1825 *to* 1834 *inclusive.*

Deaths.	From Birth to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to
1825	262	32	53	53	46	58	53	61	43	6	1
1826	202	29	37	39	63	53	75	83	37	5	1
1827	208	25	37	49	57	55	55	60	42	3	0
1828	497	35	61	49	37	47	59	53	28	3	0
1829	226	12	59	39	38	41	56	54	35	4	2
1830	264	28	46	51	38	53	52	57	26	6	0
1831	307	43	35	40	44	28	54	61	40	3	1
1832	362	59	91	108	106	116	83	98	35	8	0
1833	349	39	60	59	46	53	71	68	48	2	0
1834	446	38	64	57	54	71	57	73	41	5	0
Total...	3123	340	543	544	529	575	615	668	375	45	5

* The second series include the undernamed four parishes:—Alphington, Heavitree, Ide, and St. Leonard.

Table 2.—The distribution of these 7362 deaths, according to their several ages in the different months, during the ten years from 1825 to 1834 inclusive.

Deaths.	From Birth to 10.		10 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 to 90.		90 to 100		100 to		Total.	
	Male	Fem.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Male	Fem.
January	117	88	9	21	22	21	19	17	26	17	23	21	22	27	28	43	18	19	2	3	1	0	287	277
February	99	99	16	5	16	24	21	13	20	15	27	15	29	32	18	46	13	28	4	3	0	1	263	281
March	141	112	12	18	27	18	22	17	14	17	23	25	22	30	22	32	15	24	0	1	0	0	298	294
April	138	95	14	13	27	10	25	10	26	17	16	27	15	25	18	23	21	13	4	6	0	0	304	239
May	148	130	11	16	26	25	21	21	20	18	21	16	17	25	25	18	8	11	0	2	0	0	297	282
June	128	106	11	17	28	17	19	15	15	16	24	17	19	21	13	23	11	8	0	1	0	0	268	241
July	123	118	12	11	30	20	26	17	30	15	24	12	22	20	25	33	9	14	1	0	0	1	302	261
August	244	192	26	28	39	37	48	46	47	41	36	39	38	42	30	48	12	26	0	3	0	1	520	503
September	169	149	25	16	17	24	27	19	23	20	27	35	24	33	32	33	17	17	1	1	0	0	362	347
October	151	132	12	7	14	18	27	24	22	18	35	19	27	25	25	30	9	24	1	3	1	0	324	300
November	114	98	12	14	19	21	28	15	16	21	27	16	24	27	24	24	12	16	2	4	1	0	278	256
December	135	97	9	5	19	24	20	27	37	18	31	19	24	25	19	36	16	14	0	3	0	0	310	268
Total	1707	1416	169	171	284	259	303	241	296	233	314	261	283	332	279	389	161	214	15	30	3	3	3813	3549

Table 3.—The number of deaths in each year for ten years.

	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Males	333	297	326	446	306	344	340	524	412	485
Females ..	335	327	265	423	260	277	316	542	383	421
Total ...	668	624	591	869	566	621	656	1066	795	906

Table 4.—The average annual number of deaths in the twenty-one town parishes.

Males.	Females.	Total.
381.3	354.9	736.2

Table 5.—The average monthly number of deaths in the twenty-one town parishes.

Males.	Females.	Total.
31.8	29.5	61.3

Table 6.—The average number of deaths for each month.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Males ...	28.7	26.3	29.8	30.4	29.7	26.8	30.2	52.0	36.2	32.4	27.8	31.0
Females..	27.7	28.1	29.4	23.9	28.2	24.1	26.1	50.3	24.7	30.0	25.6	26.8
Total...	56.4	54.4	59.2	54.3	57.9	50.9	56.3	102.3	70.9	62.4	53.4	57.8

Country Parishes.—The gross amount of deaths which have occurred in ten years (i.e. from 1825 to 1834 inclusive) in the four country parishes is 923, of which 448 are males, and 475 females.

TABLE 1.—*The distribution of these 923 deaths according to their several ages in each year for the ten years from* 1825 *to* 1834 *inclusive.*

Deaths.	From Birth to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100to
1825	33	7	8	4	5	9	12	7	7	0	0
1826	30	7	5	6	6	10	8	11	7	1	0
1827	23	1	4	3	2	3	5	4	2	1	0
1828	70	5	6	5	8	12	2	12	6	2	0
1829	32	3	8	7	7	6	9	13	8	2	0
1830	29	3	5	7	7	7	8	11	3	1	0
1831	36	6	7	5	1	7	6	12	6	0	1
1832	24	6	9	8	8	6	12	9	6	0	0
1833	44	10	9	4	10	10	5	10	3	0	0
1834	53	4	7	7	5	7	8	12	4	1	0
Total...	374	52	68	56	59	77	75	101	52	8	1

Table 2.—The distribution of these 923 deaths, according to their several ages, in the different months, during the ten years from 1825 to 1834 inclusive.

Deaths.	From Birth to 10.		10 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 to 90.		90 to 100		100 to		Total.	
	Male	Fem.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Male	Fem.
January	23	8	3	0	4	5	1	5	3	3	4	2	5	1	2	4	3	3	0	1	0	0	48	32
February	13	13	0	2	1	1	2	3	1	1	2	1	4	0	5	7	4	2	1	1	0	0	33	31
March	15	12	0	4	1	3	4	3	1	0	4	4	5	6	1	8	3	1	0	1	0	0	34	42
April	12	11	4	3	2	2	3	1	4	6	8	4	5	3	6	3	2	2	0	0	0	0	46	35
May	12	12	4	1	2	5	2	3	3	2	5	1	0	0	4	3	2	2	1	2	0	0	35	31
June	17	17	3	2	3	4	2	2	1	4	4	3	6	2	2	2	1	1	0	0	0	0	39	37
July	12	14	1	6	2	2	2	1	3	4	2	5	2	2	3	5	0	6	0	0	0	0	27	45
August	19	22	1	3	0	9	3	3	4	3	4	1	2	5	2	6	1	0	0	0	0	1	36	53
September	29	18	2	1	3	5	2	1	0	2	1	3	3	3	4	11	2	1	0	1	0	0	46	46
October	11	15	2	4	2	3	5	4	2	4	3	4	2	6	3	3	2	4	0	0	0	0	32	47
November	21	18	2	1	3	1	1	0	0	4	5	4	3	6	4	6	4	1	0	0	0	0	43	41
December	14	16	0	3	3	2	2	1	2	2	3	0	2	2	2	5	1	4	0	0	0	0	29	35
Total	198	176	22	30	26	42	29	27	24	35	45	32	39	36	38	63	26	26	2	6	0	1	448	475

Table 3.—The number of deaths in each year for ten years.

	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Males...	50	51	23	52	39	43	45	35	57	55
Females.....	42	40	25	76	56	38	42	53	48	53
Total ...	92	91	48	128	95	81	87	88	105	108

Table 4.—The average annual number of deaths in the four country parishes.

Males.	Females.	Total.
44.8	47.5	92.3

Table 5.—The average monthly number of deaths in the four country parishes.

Males.	Females.	Total.
3.73	3.96	7.69

Table 6.—The average number of deaths for each month.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.	Dec.
Males.....	4.8	3.3	3.4	4.6	3.5	3.9	2.7	3.6	4.6	3.2	4.3	2.9
Females...	3.2	3.1	4.2	3.5	3.1	3.7	4.5	5.3	4.6	4.7	4.1	3.1
Total ...	8.	6.4	7.6	8.1	6.6	7.5	7.2	8.9	9.2	7.9	8.4	6.

The first circumstance that presents itself for observation, in looking over the above tables, is the

greater proportion of male mortality over that of the female in the town parishes, while the contrary law obtains in those of the country: thus, in the former, the male deaths bear the proportion of 51.80 to a hundred, and the female 48.20; while in the latter, the males bear only the proportion of 48.53, and the females 51.47. This discrepancy may not unfairly be accounted for by the occupations and circumstances of a city generally attracting the male population from its neighbourhood and appropriating it to itself, while the same inducements are not held out, at least in the same extent, to the female.

As I do not, at this time, purpose entering into the general question of the law of Mortality, any consideration of Table, No. 1, as regards its illustration of the effects of climate, may be better referred to subsequently, when the *force* of mortality is separately examined in the several years.

With regard to the relative mortality in each month, August appears, in the town parishes, to range inordinately high. The average is found to be 102.3, while the mean monthly mortality is calculated to be only 61.3. This high rate, however, is somewhat accounted for by the accidental addition of a number of deaths in that month, during the prevalence of the cholera in 1832. If, however, we leave out the mortality of this month entirely, we arrive at the much lower average of 67.7,* and

* Deduct from the gross amount of the several months of August for the ten years the amount of this month in 1832, and divide the remaining sum by nine, the product is the above-mentioned corrected average:—1023 - 417 = 606 ÷ 9 = 67.7.

which may most undoubtedly be stated to be the more correct of the two: assuming this latter to be the true average, we find that September is the month of all others the most obnoxious to life, and that the three months of August, September, and October, form the period throughout the year of the greatest mortality. The remaining months do not vary very essentially in the relative proportion of the deaths that occur; the rate of mortality during the winter months is below the average, while in June by far the fewest number of deaths occur. In the country parishes there is some little deviation from the above; August, September, October, and November are the months attended by the greatest mortality, and May by the least. December, both in town and country, appears to be generally healthy; January and April, which have a low average in the former, range rather above the mean in the latter. In the country parishes we observe that August and October are peculiarly obnoxious to female life, and that January is proportionally more destructive to male existence; may not this circumstance find some explanation in the disease consequent on the dissipation, at this season of the year, chiefly indulged in by the male population.

Such are some of the circumstances worth observing: but the true relative *force* of mortality may be better appreciated by the following tables, in which the mean numbers of deaths for every month during the different periods of life are reduced to the relation which they bear to one hundred.

Table 1.—The relative mortality shewn in the number of deaths per cent. at different ages during the several months.

	Birth to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to
Jan. ...	36.34	5.31	7.62	6.38	7.62	7.80	8.70	12.58	6.56	.88	.17
Feb. ...	36.39	3.86	7.35	6.36	6.43	7.72	11.21	11.76	7.53	1.47	.18
March .	42.73	5.06	7.60	6.58	5.23	8.10	8.78	9.12	6.58	.16	
April...	42.85	4.97	6.81	6.44	7.91	7.91	7.36	7.55	6.26	1.84	
May ...	48.01	4.66	8.80	7.25	6.56	6.39	7.25	7.42	3.28	.34	
June ...	45.97	5.50	8.84	6 67	6.09	8.07	7.85	7.07	3.73	.19	
July ...	42.62	4.08	8.86	7.61	7.97	6.39	7.46	10.30	4.08	.17	.17
August	42.61	5.26	7.42	9.18	8.60	7.32	7.82	7.62	3.71	.29	.09
Sept. ...	44.85	5.78	5.78	6.48	6.06	8.74	8 03	9.15	4.79	.28	
Oct. ...	45.52	3.04	5.12	8.15	6.41	8.63	8.33	8.81	5.28	.64	.16
Nov. ...	39.51	4.86	7.49	8.05	6.92	8.05	9 53	8.98	5.24	1.10	.18
Dec. ...	40.12	2.43	7.43	8.11	8.63	8.65	8.47	9.51	5.19	.51	

Table 2.—The mean relative mortality per cent. in the several months.

Jan.	Feb.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
7.66	7.38	8.41	7.36	7.72	6.77	7.64	13.76	9.62	8.47	7.25	7.71

Table 3.—The mean relative mortality at different ages.

Birth to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to
42.40	4.64	7.36	7.38	7.18	7.81	8.35	9.07	5.09	.61	.06

These tables, which in many respects are of peculiar value, explain themselves so fully, that it is scarcely worth while to dwell particularly upon them. A few of the more striking anomalies they present may, however, be briefly referred to:— January and February appear to be especially favourable to infant life; while there appears to be a slight excess of mortality in January from the ages of 10 to 20, and a very increased proportion during 70 and 80, as also during the subsequent periods of life. February differs from January in being favourable to life during the ages from 10 to 20, and its excess of mortality commences at the early period of 30. March and April present nothing remarkable; the mortality during each period of life appears to range in about an even proportion with the calculated means. May is the month most destructive to infancy; and June, which of all months in the year is, in the aggregate, the least fatal, bears likewise a high proportion in this latter respect. July is chiefly characterised by being obnoxious to life between the ages of 70 and 80, and August between 30 and 50. September and October, with the exception of a high average of infant deaths, present nothing particularly remarkable. November and December are peculiarly characterised by being favourable to the earlier periods of life, and obnoxious to the latter.

We shall now proceed, by a series of tables, to place in apposition the climate, with the mortality of those ten years which throughout this paper has engaged our attention.

1825.

The mean monthly climate for this year.

1825.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Thermom ...	42.6	42.4	44.6	51.1	55.2	59.9	66.0	64.5	65.1	54.8	45 9	43.4	53.0
Barometer...	30.20	30.12	30.05	30.27	29.89	29.96	30.11	29.99	29.83	29.95	29.71	29.51	30.50
Prevailing winds ...	NE	W	E	E & SW	SSW	SW	SE	W	S	W	W	E	W
Wet days ...	9	9	6	9	15	14	0	16	12	17	14	18	147
Rain in inch	2.50	2.15	2.98	2.15	2.53	1.18	0	1.29	2.79	4.03	2.85	4·27	8.72

Table A.—The number of deaths in the town parishes, during this year, amounted to 668, *or* 333 *males and* 335 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	31	24	26	27	28	20	27	39	26	39	27	19	333
Females	17	31	28	18	22	30	23	29	32	38	41	26	335
Total	48	55	54	45	50	50	50	68	58	77	68	45	668

Table B.—The number of deaths in the country parishes, during this year, amounted to 92, *or* 50 *males and* 42 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	5	6	4	3	0	5	4	5	2	5	6	5	50
Females	1	3	1	4	0	2	3	7	4	9	4	4	42
Total	6	9	5	7	0	7	7	12	6	14	10	9	92

Remarks.—This year, in which the mortality is far below the usual average, is characterised as being warm with south-west and west winds, with a low

average of rain. In January, during which a small proportion of deaths took place, the temperature was very warm, the climate genial, and the number of rainy days amounted but to nine. The mortality attains its highest proportion during the months of July, August, and September, which are marked by a high range of the thermometer. In October, in which a decrease of temperature took place attended by a large proportion of rain, the mortality is in the excess.

1826.

The mean monthly climate for this year.

1826.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Therm.	37.7	47.3	45.1	52.0	53.5	67.7	67.4	65.7	61.3	57.6	43.6	46.	53.7
Barom.	29.94	29.90	29.93	29.99	30.00	30.20	29.97	29.96	29.87	29.88	29.82	29.57	29.86
Prev. wds.	E	SW	NE	NW	NE	NW	W	SW	SW	W	N	W	NE & SW
Wetds.	8	15	13	10	11	7	12	11	12	18	15	19	151
Rain ...	2.30	4.23	2.67	.88	1.99	.35	1.08	2.50	5.29	3.40	2.36	3.48	30.53

Table A.—The number of deaths in the town parishes during this year amounted to 624, *or* 297 *males and* 327 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	21	18	16	26	15	26	29	41	36	24	23	22	297
Females	33	35	23	25	13	15	22	39	46	24	29	23	327
Total	54	54	39	51	28	41	51	80	82	48	52	45	624

Table B.—The number of deaths in the country parishes during this year amounted to 91, *or* 51 *males and* 40 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	8	4	3	7	5	4	4	4	8	1	2	1	51
Females	4	3	3	5	2	3	4	6	6	1	2	1	40
Total	12	7	6	12	7	7	8	10	14	2	4	2	91

Remarks.—This year, like the preceding, has but a low rate of mortality; the months for the most part appear to have been warm, with but few wet days. February has relatively a large mortality, and is characterised by a high temperature, attended by a considerable quantity of rain; while March, which has a low mortality, is considerably colder than the previous month, with scarcely half the quantity of rain. August and September, in which the greatest proportion of deaths during this year occurred, are merely characterised as being exceedingly warm.

1827.

The mean monthly climate for this year.

1827.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Therm	39.4	35. 6	46.5	51.0	54.7	58.9	65.3	61.8	59.2	53.0	48.5	47.3	51.9
Barom.	29.85	29. 9	29.98	29.91	29.44	29.94	30.08	30.00	29.95	29.70	29.98	29.53	29.80
Prev. wds.	NW	NE	W	E	W	W	W	NE	W	SW	W	SW	W
Wet ds.	20	3	22	9	18	13	9	15	13	18	13	17	170
Rain ...	1.97	1.14	4.07	1.68	2.92	1.11	1.47	2.29	4.15	6.06	2.37	4.04	33.23

Table A.—The number of deaths in the town parishes during this year amounted to 591, *or* 326 *males and* 265 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	39	33	27	23	22	28	24	25	30	25	18	32	326
Females	28	35	23	19	17	17	23	37	27	11	13	15	265
Total	67	68	50	42	39	45	47	62	57	36	31	47	591

Table B.—The number of deaths in the country parishes during the year amounted to 48, *or* 23 *males and* 25 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	5	3	2	0	2	3	2	0	2	2	1	1	23
Females	1	4	5	3	2	0	1	2	2	3	1	1	25
Total	6	7	7	3	4	3	3	2	4	5	2	2	48

Remarks.—This year, which has the fewest number of deaths of the ten years quoted, is marked by a climate very nearly approaching to the mean. The three first months are attended by rather an undue share of mortality; the climate of these months presents, however, nothing remarkable, excepting that in January and March a large number of rainy days is registered, and that February is colder than is usually the case. The three last months of this year, when the fewest number of deaths took place, are characterised by being both wet and warm.

1828.

The mean monthly climate for this year.

1828.	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Therm.	43.6	43.9	46.5	49.1	54.9	61.4	61.2	61.2	50.2	52.9	48.5	46.9	52.5
Barom.	29.90	29.80	30.24	29.79	29.81	30.00	29.71	29.82	29.56	30.05	29.85	29.89	29.97
Prev. wds.	SW	W	NE	W	SE	SE	SW	W	SW	SW	W	SW	W & SW
Wet ds.	14	15	12	18	23	12	25	20	13	12	15	19	196
Rain ...	5.41	3.30	1.25	3.73	3.27	3.63	4.50	2.59	3.42	2.21	3.09	3.96	40.31

Table A.—The number of deaths in the town parishes during this year amounted to 869, *or* 446 *males and* 423 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec.	Total.
Males...	17	26	34	31	59	41	33	62	45	36	30	32	446
Females	22	25	41	29	43	46	46	38	32	38	35	28	423
Total	39	51	75	60	102	87	79	100	77	74	65	60	869

Table B.—The number of deaths in the country parishes during this year amounted 128, *or* 52 *males and* 76 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec.	Total.
Males...	2	1	2	7	5	7	4	7	6	1	7	3	52
Females	5	2	8	6	7	6	9	7	8	7	6	5	76
Total	7	3	10	13	12	13	13	14	14	8	13	8	128

Remarks.—This year, with the exception of 1832, when the cholera prevailed, presents by far the highest rate of mortality, and is characterised by being exceedingly warm and very wet. The

months in which the least mortality took place were January and February: they were, for winter months, warm and genial, while the corresponding months of the previous year were cold and bleak, and attended by an excessive mortality, thus fully illustrating the observations made when contrasting the temperature of these several months.

1829.

The mean monthly climate for this year.

1829.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals & Mns.
Therm.	33.9	42.6	41.2	44.2	57.3	59.7	61.0	59.9	54.4	50.3	41.4	35.9	48.7
Barom.	29.77	30.01	29.76	29.50	30.00	30.00	29.78	29.90	29.79	30.01	29.96	30.04	29.75
Prev. wds.	NE	NW	E	W	SE	NW	S	NW	SW	W	NE	NE	W and NW
Wet ds.	10	9	9	23	8	14	23	17	19	10	10	10	182
Rain ...	2.02	1.64	2.46	5.92	0.79	4.58	5.61	2.69	5.43	1.21	1.03	.71	34.09

Table A.—The number of deaths in the town parishes during this year amounted to 566, *or* 306 *males and* 260 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	28	24	25	26	34	22	23	15	26	23	26	34	306
Females	28	23	26	24	13	16	18	17	16	22	26	26	260
Total	56	47	51	50	52	38	41	32	42	45	52	60	566

Table B.—The number of deaths in the country parishes during this year amounted to 95, *or* 39 *males and* 56 *females; these deaths occurred during the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males. .	5	3	4	6	4	5	1	4	2	1	1	3	39
Females	6	3	9	3	5	4	4	3	6	8	3	2	56
Total	11	6	13	9	9	9	5	7	8	9	4	5	95

* Vide p. 159.

Remarks.—This year, which has a small mortality, is generally characterised by being cold and moist. December and the earlier months of the year have a larger mortality than is their usual proportion, the climate of which period is registered as being cold, with prevailing winds from the north and east ; while August, the month in which the greatest mortality usually takes place, has in this year the least number of deaths, its climate being a little below that of summer temperature.

1830.

The mean monthly climate for this year.

1830.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals & Mns.
Therm.	32.7	38.1	47.1	49.5	55.1	57.7	62.9	60.4	55.0	53.2	47.7	37.8	49.8
Barom.	29.96	29.88	30.08	29.71	29.82	29.86	29.42	29.88	29.78	30.17	29.75	29.59	29.68
Prev. wds.	NW	W	W	W	SE	W	W	NW	W	SE	SE	NW	W and NW
Wet ds.	13	12	9	12	14	15	17	20	19	11	15	20	171
Rain ...	2.14	.92	.83	2.93	2.56	3.61	2.26	3.07	3.29	0.50	5.55	5.05	32.71

Table A.—The number of deaths in the town parishes, during this year, amounted to 621, *or* 344 *males and* 277 *females ; these deaths occurred through the several months as follows :—*

	Jan.	Feb	Mar	Apr	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	41	34	20	36	25	17	25	32	27	19	30	29	344
Females	29	22	22	23	29	18	16	22	28	21	20	27	277
Total	70	56	51	59	54	36	41	54	55	40	50	56	621

Table B.—The number of deaths in the country parishes, during this year amounted to 81, *or* 43 *males and* 36 *females; these deaths occurred during the several months as follows;—*

	Jan.	Feb	Mar	Apr	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	10	4	0	2	2	3	5	1	4	3	7	2	43
Females	4	3	3	1	3	4	5	2	2	3	3	5	38
Total	14	7	3	3	5	7	10	3	6	6	10	7	81

Remarks.—This year has a low range of mortality: with the exception of its mean temperature being rather less than the general mean of Exeter, it presents nothing remarkable. January, which was peculiarly cold, with prevailing winds from the north-west, had the largest number of deaths; while June, with a moist genial temperature, had the fewest.

1831.

The mean monthly climate for this year.

1831.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Therm.	37.7	42 5	45.6	49.8	54.6	61.0	63.3	64.9	56.0	55.7	46.1	44.2	51.6
Barom.	29.48	29.83	29.84	29.35	29.85	29.90	29.97	29.95	29.91	29.79	29.92	20.74	29.77
Prev. wds.	N	W	W	N	E	SW	NE	NW	NW	S	NW	SW	NW & SW
Wet ds.	15	14	14	9	14	16	10	16	16	20	18	19	181
Rain ...	3.11	3.12	2.33	2.95	1.49	0.95	2.17	1.80	2.17	5.52	3.49	5.78	34.88

Table A.—The number of deaths in the town parishes, during this year, amounted to 656, *or* 340 *males and* 316 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	13	25	29	36	17	22	25	42	41	34	24	32	340
Females	31	22	30	19	20	18	29	27	36	35	15	34	316
Total	44	47	59	55	37	40	54	69	77	69	39	66	656

Table B.—The number of deaths in the country parishes, during this year, amounted to 87, *or* 45 *males and* 42 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	5	3	3	6	3	4	1	3	5	2	6	4	45
Females	2	1	2	2	0	3	7	8	2	6	4	5	42
Total	7	4	5	8	3	7	8	11	7	8	10	9	87

Remarks.—This year presents a low rate of mortality, with a climate nearly approaching that of the mean temperature of the district, but otherwise characterised by an unusual fall of rain. We observe that during May, when the prevailing wind was east, and the temperature mild, with but a small proportion of rain, the deaths were fewest. With this exception there appears to be nothing otherwise very worthy of remark.

1832.

The mean monthly climate for this year.

1832.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Therm.	40.4	39.8	43.8	47.6	54.0	59.5	62.7	62.1	46.5	59.	45.3	43.4	49.7
Barom.	29.91	30 00	29.89	29.98	29.91	29.90	30.09	29.85	30.09	30 03	29.80	29.94	29 85
Prev. wds.	N	N	NW	NW	NW	W	S & SE	SW	W	S	W	W	N W & W
Wet ds.	10	8	16	9	7	10	6	12	2	9	20	16	12.3
Rain ...	1.31	0.84	2.62	1.20	1.81	2.32	1.54	5.10	0.38	4.00	5.72	3.37	30.21

Table A.—The number of deaths in the town parishes during this year amounted to 1066, *or* 524 *males and* 542 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	28	24	32	34	23	24	35	189	61	26	21	27	524
Females	28	32	40	26	23	17	28	228	47	32	18	23	542
Total	56	56	72	60	46	41	63	417	108	58	39	50	1066

Table B.—The number of deaths in the country parishes during this year amounted to 88, *or* 35 *males and* 53 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	2	1	5	5	2	2	0	6	4	3	3	2	35
Females	2	3	2	3	4	5	4	8	9	1	9	3	53
Total	4	4	7	8	6	7	4	14	13	4	12	5	88

Remarks.—This year is one particularly to be remembered in the medical annals of Exeter, for it was during the latter part of July, and the whole of August and part of September, that the pestilence of the age committed here its ravages. The increase of mortality in these months sufficiently indicates its presence. The period generally was characterised as being excessively warm and dry, with occasional very heavy showers.

1833.

The mean monthly climate for this year.

1833.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Therm.	36.6	43 5	38.3	46.0	57.0	57.9	61.8	59.8	55.0	51.7	46.4	46.6	50.1
Barom.	29.85	29.49	29.82	29.75	30.05	29.80	30.02	30.00	29.93	29.77	29.94	29.78	29.72
Prev. wds.	NE	W	NW	W	S	W	NW	W	W	S	NW	W	W & NW
Wet ds.	9	20	12	18	4	22	11	5	18	16	14	27	176
Rain ...	2.01	7.81	1.76	3.44	0.62	5.11	0.77	0.60	1.98	3.34	3.15	4.66	35.25

Table A.—The number of deaths in the town parishes during this year amounted to 795, *or* 412 *males and* 383 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Apr	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	36	24	36	26	37	31	34	25	36	38	41	48	412
Females	34	30	27	30	49	41	30	22	30	29	26	35	383
Total	70	54	63	56	86	72	64	47	66	67	67	83	795

Table B.—The number of deaths in the country parishes, during this year amounted to 105, *or* 57 *males and* 48 *females; these deaths occurred during the several months as follows:* —

	Jan.	Feb	Mar	Apr	May	Jun	Jul.	Aug	Sep.	Oct.	Nov	Dec	Total.
Males...	3	3	5	7	7	3	3	2	6	6	6	6	57
Females	2	1	3	5	6	4	4	5	3	5	5	5	48
Total	5	4	8	12	13	7	7	7	9	11	11	11	105

Remarks.—This year has rather a higher range of mortality than is the general mean of the city. January has more than its proportion, and is characterised by a low temperature with prevailing north-easterly winds; while August has a smaller number of deaths, with an attendant genial dry climate and westerly winds. The mortality in December was unusually severe, while the table of climate shows a series of rainy days, accompanied by a fall of rain to an extent unusual in this month.

1834.

The mean monthly climate for this year.

1834.	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals and Means
Therm.	45.6	42.3	46.1	47.2	56.7	59.1	63.4	62.1	56.5	52.3	43.4	42.6	51.5
Barom.	29.69	30.12	30.29	30.14	30.00	29.98	29.96	29.88	30.06	30.07	29.92	30.36	29.85
Prev. wds.	S & W	SW	W	E	S & SE	S	W & NE	S	SW	S	NE	N	S and NW
Wet ds.	12	13	10	5	9	13	18	18	10	9	11	8	145
Rain ...	7.03	1.70	0.81	0.97	1.23	2.95	3.30	2.15	1.96	1.25	2.25	1.04	26.65

Table A.—The number of deaths in the town parishes, during this year amounted to 906, *or* 485 *males and* 421 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	J n	Jul.	Aug	Sep.	Oct.	Nov	Dec.	Total.
Males...	33	31	44	39	37	37	47	50	34	60	38	35	485
Females	27	26	34	26	48	23	26	44	53	50	33	31	421
Total	60	57	78	65	85	60	73	94	87	110	71	66	906

Table B.—The number of deaths in the country parishes, during this year amounted to 108, *or* 55 *males and* 53 *females; these deaths occurred through the several months as follows:—*

	Jan.	Feb	Mar	Ap.	May	Jun	Jul.	Aug	Sep.	Oct	Nov	Dec.	Total.
Males...	3	5	6	3	5	3	3	4	7	8	4	2	55
Females	5	8	6	3	2	6	4	5	4	4	4	4	53
Total	8	13	12	6	7	9	7	9	11	12	8	6	108

Remarks.—The mortality of this year ranges far above the usual mean, but perhaps this is somewhat to be explained by a slight recurrence of the Asiatic cholera. It is worthy of remark, and for which there does not appear to be sufficient explanation, that this disease committed its ravages chiefly among the lunatics confined in the Asylum attached to the Workhouse of the city. October, in which this disease occurred, is not characterised by any very peculiar atmospheric deviations.

Sufficient has been shown in the few very scanty remarks, which are made on the preceding tables, to enable me to conclude, that though the effect of climate is not so obvious and distinct as one might be led to suppose from the observation of Dalmas, who, when speaking of the connection of the yellow fever with the state of the atmosphere, affirms that after a residence of ten years in the West Indies, he could foretell, by the inspection of his barometer, the re-appearance or cessation of this malady, yet there can be no doubt that its influence is very considerable, and that it will merely require an extensive series of accurate investigations to show that the popular expressions of "healthy and unhealthy weather" are somewhat referable to certain local temporary conditions of the atmosphere.

[THE CONCLUDING PORTION OF THIS PAPER, EMBRACING THE GENERAL LAW OF MORTALITY, TOGETHER WITH THE MEDICAL HISTORY AND MEDICAL STATISTICS OF THE CITY, WILL FOLLOW IN A SUBSEQUENT VOLUME.]

N.B. Since that portion of this paper devoted to climate was printed, Dr. Barham of St. Leonard's, has published a sheet of tables on the Atmospheric Phenomena of Exeter, deduced from a series of observations made by himself during the period of seven years. I have mentioned in a previous page that Dr. Barham was so obliging as to furnish me with some observations of great interest.

APPENDIX No. 1.

HEIGHTS OF PLACES IN AND ABOUT EXETER.*

	feet.
From high water mark at Salmon Pool to the first drawbridge (on the coping) the rise is	16.64
The centre of Alphington Street is above high water mark	16.22
Corner of St. Thomas' Street	17.69
Crown of Exe Bridge	33.59
Opposite Westgate	59.05
Opposite St. John's Church	107.50
Opposite Guildhall	128.53
Opposite Eastgate	142.22
Opposite New London Inn	141.15
St. Ann's Chapel	157.04
Lowest part of Longbrook Street	99.26
Hill's Court (opposite Mr. Cornish's house)	122.00
Entrance to King's Cottages	170.00
Entrance to Union Road	189.24
Waterloo Cottages	308 62
Entrance to Pensylvania	346.17
First Mile-stone	380.00
Highest part of the road at Marypole	429.49
Highest land at Marypole	441.00
Highest land on Stoke Hill	514.93
Belvidere on Haldon	819.00
The summit of Whiteston Hill	663.00
Long Down End	597.00

APPENDIX No. 2.

THE BOVEY CLAY AND COAL FORMATIONS.†

These commence at the base of the granite hills, in a large natural basin of irregular form, about seven or eight miles in circumference, situated in the parishes of Hennock, Bovey-

* The heights in Exeter were kindly taken for me by Mr. Geo. W. Cumming, Civil Engineer.

† The sketch of these formations is by Mr. Kingston of Ilsington.

Tracey, Ilsington, and Teigngrace, and nearly surrounded by hills of considerable elevation, they continue on, by a natural opening in a south-east direction, to Teignbridge and Kingsteignton, and thence across the Teign, by Newton and by Ford, at the base of Melburn Down, and might probably be partially traced in that direction on to the sea coast near Goodrington.

The Bovey clay consists principally of deposits of clay of different degrees of purity, from that of a coarse and gritty quality to the purer marketable sorts, horizontally alternating with other deposits, consisting of sand and gravel, the whole apparently formed from the debris and decomposition of the primitive hills that bound it at the western end. Debris, from the green sand formation, apparently water worn, also occur sparingly at the surface of the eastern side.

These deposits consist chiefly of five clay beds of various width, running parallel with as many alternating ones of gravel, whose width varies from fifty to one hundred feet; the loose head of earth and gravel on these varies considerably, from five or six feet to twenty-five or thirty; beneath this incumbent stratum the clay beds lie not in a straight level manner, but undulating like the waves of the sea. Beneath the four western-most beds, which are worked to depths varying from thirty to eighty feet, the Bovey coal runs; under the most eastern or pipe clay, which is also frequently worked to the depth of eighty feet, white quartz and sand are found. The Bovey coal, which passes under this, occurs in stratified beds, which occupy a space of seventy feet altogether in thickness, and dip, at an angle of about twenty-four or twenty-five degrees, near the pottery in the parish of Bovey, where the largest body of it appears to be situated, and where it approaches to within five or six feet of the surface. At this spot are six beds of various thickness, interposed between brownish clay; in this clay small veins of coal resembling reeds and grass are found, and retinasphaltum; the whole is covered by a loose gravelly head. The main beds of this formation appear very obviously to consist of the wood of the dicotyledonous trees imperfectly

mineralized. The available portion of this, as we have previously stated, consists of five distinct beds, running parallel between as many others of gravel: the two westernmost beds are what are technically called cracking clay; the two next, or middle beds, black clay, (these four are the beds used in the manufactory of porcelain and earthenware); and the most eastern bed, which is much wider than either of the others, pipe clay. This is so strongly impregnated by iron that it is unfit for the potters' use, and is confined to the manufactory of pipes. The pure body, adapted for the market, commences on the left bank of the Teign, nearly opposite Newton,—the cracking and black clay beds extending towards the north-west, to the base of the granite hills, between Hightor and Bovey Tracey; the pipe clay is limited by the opposite hills, as previously stated. Clay has been worked on the opposite side of the Teign, but it has proved of an inferior quality, unfit for the market; it is worked in square open pits, to various depths, of from thirty to eighty feet. Under the whole of the four western beds, Bovey coal occurs, and abundance of water,—under the eastern one, sand. The clay is cut out in small cubic junks of thirty pounds weight each, technically called clay balls, of which many thousand tons are annually shipped off to the potteries from Teignmouth; a part is conveyed by carts to the Hackney cellars, but the principal portion is taken down the Stover canal in barges.

Lastly, the Bovey coal.—The chief use to which this is applied, is the manufacture of an inferior description of earthenware, at the potteries on Bovey Heath; it is also used as fuel in the cottages of the neighbouring poor, but its difficult and imperfect combustion, and the fœtid gas emitted during the process, prevent its being used, to any great extent, for domestic purposes. Many experiments have been made to render this article more extensively useful, but hitherto without any approach to success, the large proportion of earthy and incombustible matter which it contains, having hitherto proved an insurmountable obstacle. The charcoal produced from it is of excellent quality, but not in pieces of sufficient size and

compactness to stand a blast. It would be a most important advantage to the neighbourhood, if any means could be devised to make it available in the smelting of iron; the chief difficulty to overcome, appears to be the getting rid of the ashes, which, by their rapid accumulation, prevent a sustained white heat from being kept up in the furnace.

As the opinion that black coal (provincially sea coal,) may yet be discovered in the neighbourhood does not appear to be quite obsolete, we shall conclude this general sketch with a brief statement of the reasons that make this extremely improbable within the limits of the district we are describing.

From the greater number of geological facts which have been collected and generalized, certain deductions have been drawn relative to the order of surperposition of the different rock strata, and of the organized fossil remains preserved in them, that appear to rest on a firm basis; thus the primitive rocks contain no fossil remains; those of the transition formation occasionally contain zoophytes, mollusca, and a few crustacea. These are the earliest organic forms that occur, and are met with in the transition limestone of the district; our red sandstone rests immediately on these without any other interposed strata, so that whether we consider it as being an older, or more recent, member of the secondary class, the result in boring through it would be the same, viz., we should arrive at the transition rocks, which are of more ancient origin than those containing the coal measures. The same may be observed of the green sand, a still more recent member of the secondary class, and which rests immediately on the last, without any of the members of the oolitic formation, as is elsewhere the case, interposing. There appears to be nothing very singular in this, as it is a general fact that the more recent the strata, the more limited is their extent, and the more partial their distribution; for instance, the chalk does not extend to us, though the beds of flint, incumbent on the green sand, appear to be interrupted portions of those resting on that formation in Dorsetshire. The Bovey clay basin, containing the brown coal deposit, has already been

bored to the depth of two hundred feet through a coarse gritty clay, which boring, had it been further continued, would most probably have reached some rock of the primitive class, as appears from the geological character of the neighbourhood on either side this curious deposit.

MINERALS.*

Anthracite.—In the grauwacke slate formation on the coast near Bideford; it approaches rather to a black chalk, and does not contain above ten per cent. of carbon.

Wood Coal.—Bovey.

Retinasphaltum.—Accompanying Bovey coal.

Quartz.—*Amorphous.*—*Topazine:* associated with tourmaline.—*Crystallised, opake, white:* frequent in the granite formation.—*Black:* Haytor mine.—*Transparent, colourless:* granite and slate, and in flint on Haldon.—*Amethystine, purple,* and *rose-red:* fine specimens have occurred in Geodes at the Haytor mine.—*Ruby-red:* Haytor mine; rare; small but very beautiful and perfect crystals, lining cellular quartz.—*Irisated:* ditto.—*Yellow:* ditto; some crystals occur of a very clear and fine texture.—*Brown:* ditto; of various shades.—*Cairngorm:* ditto; fine specimens, but rare.—*Pseudo morphous:* ditto; taking some of the forms of garnet and of iron pyrites.—*Spongiform, capped, Babel, radiated, lamellated, cellular,* and *stalactitic.*—Varieties also occur in the Haytor mine; and *quartz* with perfect pyramids at both ends of the prisms were found at Sampford Spiney.

Chalcedony.—*Beautiful blue*: in fissures and cavities of Chert in the green sand formation at Sidmouth, and transfused through the fossil shells in the whetstone pits of Blackdown and Haldon.—*Agate:* Haldon; occasionally

* This list is arranged according to the system of Dr. Thomson; it is in great measure compiled from the lists of Mr. Kingston and the Rev. D. Lysons.

passing into quartz.—*Carnelion:* on Haldon.—*Haytorite*, or *pseudomorphous crystals:* these are of various sizes, taking the forms of quartz, garnet, and iron pyrites; the name is derived from the mine where they occur.—*Hydrophanous, stalactitic, mamillated, botryoidal, &c. &c.*

Flint.—Haldon.

Opal.—*Semi opal:* of various colours, (yellow, green, blue, whitish, striped); of frequent occurrence at the Haytor mine, in rounded nodules, invested by indurated clay, (Lithomarge.) Mr. Kingston has specimens closely approaching the texture of true opal.

Jaspar.—*Common red:* Bishopsteignton, Doddiscombsleigh, and Haldon Hill.

Basanite.—Bordering the eastern side of Dartmoor.

Hyalite.—Haytor; rare.

Antimony.—Chudleigh, Budleigh, and Hennock.

Soda, *Effervescing carbonate of.*—Found by Dr. Wavell in the tower of Stoke church.

Sulphate of Barytes.—Petitor and Babicombe, in veins of limestone rock, as opake concentric laminæ.

Calcareous Spar.—Crystals of a great variety of forms are frequent on the sides and crevices of the lime rocks, quarries, &c., and well defined ones are also frequent in the sandstone cliffs.—*Stalactites* and *Stalagmites:* lime caverns; common.—*Marble:* great varieties.

Arragonite.—In the grauwacke slate near Torquay, Ilfracombe, and Buckfastleigh.

Magnesian Limestone.—Bickington.

Apatite.—Associated with tourmaline.

Gypsum.—Nodules occur in the green sand, Haldon.

Fluor.—*Green:* Beer Alston.—*Purple:* Wheal Crowndale.

Pyroxene.—Common in slate formation.

Amphibole.—Ditto.

Garnet.—*Massive:* near the junction of the granite and slate of Hightor.—*Crystallised:* common; of various shades.—*Pyrenaite:* rare; from Hightor.

Staurotite.—In granite, probably from Hightor.

Felspar.—*Common:* well defined crystals of various sizes, usually white or flesh-red, are frequent in the granite. Magnesian rose coloured, in a decomposing state, from the Hightor works, often approaching asparagus stone.

Wavellite.—In black grauwacke slate near South Molton.

Steatite.—In the conglomerate.

Chlorite.—Haldon.

Mica.—In granite of Dartmoor.

Epidote.—In the bed of the Ockment.

Oxinite.—Ditto, and in the sienitic rock near Haytor.

Tourmaline.—At Wooley.

Schorl.—Frequent in old stream works at Dartmoor.

Pitch Stone.—Near Canonteign, on the sienite of Bolton rock.

Iron.—*Magnetic:* South Brent.

Hœmatite.—*Brown:* Ilsington.

Iron Pyrites.—*Yellow*, *crystallised*, *radiated*, *arsenical*, and *auriferous:* frequent in the slate formation, and in the Bovey coal formation; the three last varieties occur at the Haytor mine.—*White:* ditto.

Oxidulated Iron.—*Crystallised.*—*Specular octohedrons:* at the Haytor mine, frequent.

Micaceous Iron.—Hennock and Lustleigh.

Bog Iron.—Frequent in low swampy bottoms in the slate district.

Arsenical Pyrites.—Granite.

Manganese.—Frequent.

Manganese, *Silicate of.*—Near Tavistock.

Cobalt Ochre.—Near Dawlish and Ugbrook Park.

Sulphuret of Zinc.—Hennock and Ilsington.

Galena.—Hennock and Ilsington.

Lead.—*Brown Carbonate:* Coomb Marten.—*White Carbonate:* Hennock and Sidford.—*Arsenicate:* Beeralston. (Thomson.)

Peroxide of Tin.—*Granular* and *crystallised.*—Ashburton Down mine; in pebbles, also occurs in old stream works.

Copper.—Associated with carbonate of lead, frequent.

Malachite.—Ashburton.
Blue Carbonate of Copper.—Hyner.
Copper Pyrites.—Ashburton Down mine.
Silver.—*Capillary:* Sampford Spiney.
Gold.—Stream works, Dartmoor.

THE CLAY OR AMYGDALOIDAL TRAP ROCKS OCCURRING IN THE NEIGHBOURHOOD OF EXETER.

(*Coloured brown in the Map.*)

The Trap Rocks of this district are all either clay stone or clink stone; they are tolerably uniform in their nature, and the being acquainted with the varieties of one mass, will lead to an almost certain recognition of the whole. These rocks are in considerable repute for the various purposes of building, &c., and almost the whole are quarried; hence their nature and situation may easily be studied.

The first mass of this rock is immediately behind Haldon House, where it emerges from under the green and red sandstone; it extends thence through Dunchideock to a hill nearly west of the village. It is quarried behind Haldon House, at Dunchideock, and at the last mentioned hill, where it terminates.

The second mass rises on a hill called Knowle Hill, separated from the former by a deep valley of schist. It runs down to Ide, and thence to Pocombe, where it terminates. It is quarried at Knowle Hill, at West Town near Ide, and at Pocombe.

The third mass is the hill on which the castle of Exeter stands, and forms the well-known Northernhay rock. Heretofore it has been extensively quarried; its boundaries are as follows:—from the brook, opposite the back of the castle, it crosses the field, east of the county gaol, to Hills Court; thence it turns towards the Old London Inn, and across Southernhay to the middle of the church-yard, whence crossing Fore Street, Goldsmith's Lane, and Paul Street, it returns by the western extremity of Northernhay to the brook.

The fourth mass is met with about three miles on the Broad Clist road, opposite the entrance to Poltimore, thence it extends about half a mile in the course of the Clist river. These two last masses are of small extent.

The fifth is by far the most extensive: it first appears near the road leading from Broad Clist to Crabtree, thence extends through Kellerton Park to the river Exe, which it crosses, and terminates some way beyond Thorverton. This mass is quarried in various places,—the quarries obtaining the names of the places near which they are wrought, or of the owners of the rock.

The sixth mass is at a place called Knowles, two or three miles beyond Crediton, near Cotford.

All these masses of rock, except the fifth, appear to occupy the same geological position, namely, between the clay slate and red sandstone. A portion of the fifth, however, appears to lie on the red sandstone, but on this point I am not yet quite satisfied. Pocombe quarry, from the extent to which it has been laid open, and its vicinity to the city, is the most convenient place to examine this rock; and there is no form or appearance under which this rock presents itself, that may not, at times, be observed at Pocombe. It is a clay stone, indurated, and containing minute particles of quartz. It has no stratification or particular cleavage, consequently the broken fragments assume no particular form. The fracture of the more indurated portions, which are also more uniform in their structure and appearance, is sometimes conchoidal. In this state it seems to pass into clink-stone; it is seldom met with at Pocombe, but is found at Knowle, above Ide, and in the valley below Dunchideock. The different appearances which it assumes in different parts of the quarry, render it easily and usefully divisible into veined and vesicular; they are, however, intimately intermixed. The nature of the base is the same in both kinds, namely, clay stone, with minute particles of quartz. The veins are of two kinds—calcareous spar and crystallized quartz; they are small, and penetrate the rock in all directions. Veins of clay stone of a finer

texture, and of a larger size, are occasionally seen filling the cracks in the rocks. Small vesicles occasionally occupy portions of the rock, constituting what is here called the vesicular portion; these vesicles are occasionally empty, and give the rock an honeycomb appearance; or they are filled with various substances. The vesicles are spheroidal, and seldom contain crystallised masses, and in these respects it differs from the clay stone porphyry rock. When the spheroids are considerably extended in one direction, approaching to the shape of an almond, the rock has obtained the name of amygdaloid. The following are some of the substances met with in these cavities:—indurated clay, lithomarge, green earth, indurated clay surrounding calcareous spar and rhomboid brown spar, mica, &c.

These rocks rest on the schist, and between them water is continually passing at the point of junction. They are thus constantly kept moist, and the rocks assume a peculiar appearance; masses of trap and clay slate appear to have been heaped together with the greatest irregularity, as if by some imposing force. They are united by a clay stone, soft, and kept moist by the constant filtration of the water, thus having the appearance of a weakly adhering breccia.

Its uses.—That part last spoken of, as lying at the bottom of the quarry and resembling a breccia, is unfit for any purpose whatever, falling into decay in a very few years. The whole of the other divisions are excellent under water, and resist its action almost equally with any known stone. Exposed to the variations of the atmosphere, that, in which the veins are of calcareous spar, soonest goes to decay: the spar loses its water of crystalisation and disappears, and the masses of rock contained between the veins soon crumble to dust. Where the veins are of quartz, the durability is much greater; they resist a long time the action of the atmosphere, and bind firmly together the masses of clay stone which they inclose. But that part of the rock which is most durable, is that which at first sight, one would not be inclined to

select, namely, the vesicular portion whose vesicles are for the most part empty ; it bears the tool and can be wrought. In examining the oldest buildings round the city, it will be found that the faces and edges of stones taken from the vesicular part will be in a perfect state, whilst the veined stones will be generally found passing into a decayed state. Probably the vesicular portion of the rock may have undergone a higher degree of vitrification.

The geographical and geological position of this rock having been pointed out in the pages of the essay, it is only to be added, that portions of this trap are found mixed with the red conglomerate or grauwacke.

APPENDIX, No. 3.

Tables, showing the absolute number of days each wind blew for ten years, from 1825 *to* 1834, *inclusive, being extracts from registers kept at the Devon and Exeter Institution and Lunatic Asylum.*

1825.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
January ...	2	1	0	6	12	5	0	5
February...	1	1	3	9	0	8	4	2
March	1	1	14	4	0	5	4	2
April	1	3	5	3	4	5	4	5
May	0	4	1	1	7	5	3	10
June.....	1	0	0	7	6	5	3	8
July	1	1	3	0	10	3	12	1
August.....	1	0	0	10	4	8	5	3
September..	1	7	1	9	4	3	3	2
October.....	3	2	0	16	1	1	2	6
November..	5	0	0	15	2	3	0	5
December ..	0	2	7	5	6	3	2	6
Total ...	17	22	34	85	56	54	42	55

1826.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
January ...	2	6	8	2	5	3	1	4
February...	0	2	0	7	2	1	3	13
March	4	4	4	3	11	2	0	3
April	4	0	0	6	2	11	4	3
May	2	1	2	1	18	2	4	1
June.....	2	0	5	2	6	8	5	2
July	0	0	6	9	2	4	4	6
August.....	1	5	3	4	3	5	1	9
September..	3	1	3	6	6	3	2	6
October.....	3	2	0	11	0	1	5	9
November..	9	0	0	6	5	8	0	2
December ..	5	3	4	7	5	5	0	2
Total ...	35	24	35	64	65	53	29	60

1827.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
January ...	2	1	0	6	8	9	2	3
February...	5	1	9	0	9	1	0	3
March	2	1	1	12	1	7	2	5
April	4	2	9	9	2	1	3	0
May	1	3	4	13	3	1	1	5
June.....	0	0	4	14	4	2	0	6
July	0	1	1	8	6	7	4	4
August.....	2	0	3	5	11	6	1	3
September..	2	1	6	9	2	2	1	6
October.....	2	5	3	5	1	1	5	9
November..	4	3	1	8	2	5	2	5
December ..	0	5	1	8	1	4	2	10
Total ...	24	23	42	97	50	46	23	59

1828.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
January ...	0	1	7	7	2	2	3	9
February...	2	2	2	8	6	2	2	5
March	1	0	0	7	10	3	3	7
April	2	2	1	9	4	4	4	4
May	2	3	4	3	3	6	7	3
June.....	3	0	1	7	0	5	9	5
July	1	2	0	9	2	5	1	11
August.....	0	1	1	10	3	4	5	7
September..	0	1	8	1	7	0	4	9
October.....	3	3	7	6	1	1	2	7
November..	1	4	5	10	0	2	4	4
December ..	1	4	0	7	0	1	5	13
Total ...	16	23	36	84	38	35	49	84

1829.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
Jauuary ...	3	0	5	2	11	6	4	0
February...	0	0	4	8	2	7	5	2
March	0	1	11	2	8	2	5	2
April	4	3	1	8	3	2	2	7
May	1	2	5	5	3	5	8	2
June.....	4	6	0	1	3	7	4	5
July	3	7	0	6	0	6	4	5
August.....	3	6	0	6	0	12	1	3
September..	1	5	2	5	2	3	0	12
October.....	5	2	2	11	3	6	0	2
November..	1	1	1	6	9	4	4	4
December ..	1	6	3	1	15	2	3	0
Total...	26	39	34	61	59	62	40	44

1830.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
January.....	7	0	1	3	5	14	1	0
February...	2	4	2	6	5	3	3	3
March	1	1	2	12	1	5	9	0
April	2	9	1	9	1	3	4	1
May	4	4	2	7	1	2	8	3
June.....	4	4	1	12	0	4	5	0
July	3	5	1	11	0	4	6	1
August	5	4	0	6	1	7	6	2
September..	0	4	0	11	0	9	1	5
October	3	3	4	5	2	5	9	0
November..	3	7	3	5	2	1	7	2
December..	7	0	2	5	4	9	3	1
Total ...	41	45	19	92	22	66	62	18

1831.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
January ...	8	1	6	1	7	4	4	0
February...	3	5	0	8	2	4	3	3
March	6	4	2	9	2	3	3	2
April	8	5	1	1	6	5	4	0
May	3	4	6	2	5	5	6	0
June.....	3	8	1	5	0	10	0	3
July	1	6	1	6	7	4	4	2
August.....	4	5	0	5	5	8	1	3
September..	1	5	2	4	0	8	4	6
October.....	0	14	2	2	1	2	5	5
November..	1	2	0	8	3	10	1	5
December..	3	3	0	5	4	4	6	6
Total ...	41	62	21	56	42	67	41	35

1832.	N.	S	E.	W.	N.E.	N.W.	S.E.	S.W.
January.....	8	6	4	3	1	4	5	0
February...	7	1	0	2	5	5	6	3
March	0	3	0	6	3	13	5	1
April	4	2	3	1	4	6	9	1
May	3	6	2	1	2	11	6	0
June..	0	3	1	9	2	6	5	4
July	6	8	0	4	1	4	8	1
August.....	0	9	0	7	0	4	1	10
September..	3	3	3	8	3	2	6	2
October ...	5	8	3	5	0	4	1	5
November..	6	2	1	8	2	5	6	0
December..	3	0	0	14	2	8	2	2
Total ...	45	51	17	68	25	72	60	29

1833.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.	1834.	N.	S.	E.	W.	N.E.	N.W.	S.E.	S.W.
January ...	4	0	8	1	10	4	3	1	January ...	2	8	0	8	0	2	5	6
February...	1	5	2	11	0	4	3	2	February...	4	4	2	4	1	2	4	7
March	6	1	1	2	6	11	4	0	March	2	1	5	8	3	5	2	5
April	7	2	0	8	1	7	3	2	April	5	1	8	2	7	4	3	0
May	2	10	4	1	1	7	6	0	May	3	7	0	3	7	3	6	2
June.....	1	9	0	12	0	0	4	4	June.....	1	10	1	5	2	3	2	6
July	2	5	1	8	1	11	1	2	July	2	6	3	7	7	4	0	2
August.....	5	0	0	10	6	8	1	1	August.....	4	9	1	1	2	4	4	6
September..	6	6	1	8	1	5	3	0	September..	2	4	4	4	1	5	5	5
October	5	7	3	6	1	5	3	1	October ...	6	10	0	3	2	9	0	1
November..	0	3	5	7	1	8	3	3	November..	5	4	6	3	8	2	0	2
December ..	0	8	0	14	1	4	0	4	December ..	8	5	4	4	2	4	3	1
Total ...	39	56	25	88	29	74	34	20	Total ...	44	69	34	52	42	47	34	43

Tables, showing the maximum and minimum dew-point for five years, that is, from 1832 *to* 1836, *inclusive, with corresponding atmospherical observations,—being extracts from the register kept at the Devon and Exeter Institution.*

1832.	Max	Bar.	Th.	Wind.	Weather	Min.	Bar.	Th.	Wind.	Weather
January...	44	29.57	48	S.	Showers	28	29.74	32	E.N.E.	Fair
February..	46	29 73	51	S.W.	Showers	28	29.91	32	N.E.	Cloudy
March ...	46	29.70	51	S.	Rainy	29	30.50	42	N.NW.	Fair
April	48	29.50	49	S.E.	Rainy	34	30.50	44	N.	Fair
May	52	29.98	55	S.E.	Fair	36	29.74	51	N.	Fair
June	56	29.26	60	S.S.E.	Rainy	46	29.30	59	E.	Fair
July	62	29.72	63	S.	Rainy	40	30.50	59	N.	Fair
August ...	60	29.72	62	S.W.	Rainy	44	29.68	64	N.W.	Cloudy
September	58	29.90	62	W.	Fair	42	30.20	53	N.	Fair
October ...	54	30.12	61	S.	Cloudy	40	30.10	43	N.	Fair
November	52	29.65	56	WNW.	Cloudy	35	29.62	41	N.	Fair
December	50	29.74	54	W.	Cloudy	32	30.10	33	N.	Foggy
Means & extremes	52.3	29.71	56	S.	Rainy	36.1	29.87	46.9	N.	Fair

1833.	Max	Bar.	Th.	Wind.	Weather	Min.	Bar.	Th.	Wind.	Weather
January...	40	29.90	43	S.W.	Foggy	26	30.12	31	E.	Cloudy
February..	48	29.15	47	S.	Showers	32	29.60	37	N.W.	Fair
March.....	44	29.50	50	S.	Misty	24	29.90	32	N.E.	Fair
April	49	28.79	48	E.S.E.	Rainy	32	29.52	45	N.	Fair
May	58	30.12	65	E.	Fair	40	30.12	54	N.E.	Fair
June	56	29.60	60	S.S.E.	Cloudy	46	29.89	59	W.	Fair
July	62	30.10	70	S.	Fair	48	29.80	56	N.W.	Fair
August ...	58	30.8	63	N.	Cloudy	46	30.20	58	N.E.	Fair
September	60	29.6	59	S.	Stormy	40	30.20	52	N.N.E.	Fair
October ...	54	29.50	56	E.	Showers	40	29.5	47	S.	Fair
November	56	29.76	58	W.	Showers	36	29.86	37	E.N.E.	Cloudy
December.	50	29.50	55	W.	Stormy	36	29.80	39	WNW.	Fair
Means & extremes	52.9	29.58	56.1	S.W.	Showers	37.1	29.67	45.5	N.E.	Fair

1834.	Max	Bar.	Th.	Wind.	Weather	Min.	Bar.	Th.	Wind.	Weather
January...	50	29.93	51	W.	Mt.& R	30	30.18	35	N.	Fair
February..	52	30.40	54	W.	Cloudy	30	30.15	30	N.	Fair
March	50	30.30	52	S.W.	Fair	40	30.30	38	E.	Fair
April	54	29.96	50	N.E.	Fair	40	29.95	42	N.	Fair
May	62	30.36	60	S.	Fair	50	29.25	51	S.	Cloudy
June	60	29.95	63	S.S.E.	Fair	52	29.59	58	S.S.W.	Fair
July	74	29.50	71	N.N.E.	Cloudy	55	29.43	55	N.E.	Cloudy
August ...	64	29.66	66	S.	Fair	48	29.50	55	W.	Showers
September	61	29.70	61	S.	Rainy	47	29.52	56	S.	Rainy
October...	58	29.97	59	S.	Misty	42	29.90	48	N.	Fair
November	52	29.47	58	S.	Misty	28	30.10	34	N.	Fair
December	52	29.75	52	S.	Misty	30	30.38	30	N.	Foggy
Means & extremes	57.4	29.87	58.	S.	Misty	41	29.85	44.3	N.	Fair

1835.	Max	Bar.	Th.	Wind.	Weather	Min.	Bar.	Th.	Wind.	Weather
January...	48	30.20	48	W.	Cloudy	26	29.90	30	N.	Fair
February..	48	30.00	50	E.S.E.	Cloudy	30	30.10	34	N.	Fair
March ...	48	29.35	50	S.S.W.	Showers	32	30.40	37	E.N.E.	Fair
April	50	29.75	54	S.E.	Fair	30	30.11	39	N.	Fair
May	52	29.92	58	W.	Misty	41	29.96	54	N.	Fair
June	62	29.90	67	N.	Fair	42	29.90	55	N.W.	Fair
July	62	30.00	69	N.	Fair	50	29.86	62	N.NW.	Fair
August ..	61	29.90	68	W.	Cloudy	46	29.60	57	N.W.	Fair
September	61	29.74	65	S.W.	Cloudy	40	29.20	57	W.	Fair
October ...	53	29.69	56	S.	Showers	40	29.80	48	N.W.	Fair
November	52	29.50	53	S.	Cloudy	30	30.25	33	E.N.E.	Fair
*December	48	29.40	51	S.S.E.	Showers	40	29.33	42	W.	Fair
Means & extremes	53.9	29.88	50	S.	Cloudy	37.2	29.86	45.6	N.	Fair

1836.	Max	Bar.	Th.	Wind.	Weather	Min.	Bar.	Th.	Wind.	Weather
†January...	43	29.64	43	S.	Misty	28	29.72	25	W.	Fair
February..	42	29.82	48	W.	Fair	28	30.2	39	WNW.	Fair
March ...	48	30.15	54	W.	Fair	32	29.34	41	S.	Cloudy
April	48	29.84	52	W.	Cloudy	30	29 70	42	N.N.E.	Fair
May	51‡	30.40	59	E.	Fair	34	29.88	44	E.	Fair
June	65	30.50	64	S.S.W.	Fair	48	29.70	53	E.	Showers
July	60	29.94	68	N.	Fair	49	30.28	58	N.W.	Cloudy
August ...	58	29.70	60	S.S.W.	Showers	48	30.50	58	N.W.	Fair
September	57	29.21	61	S.	Showers	44	29.92	52	N.N.W	Fair
October ...	54	29.91	58	S.	Cloudy	28	29.57	36	N.	Fair
November	48	29.43	55	W.	Rainy	32	29.54	33	E.	Foggy
December	46	29.80	53	W.	Misty	20	29.72	28	N.E.	Fair
Means & extremes	51.6	29.82	56.2	W.	Fair	35	29.78	42.4	N.W.	Fair

* But four days of this month registered.

† Fourteen first days not registered.

‡ May 15th, eclipse of the sun.

Table showing the maxima, minima, and means of the barometer and register thermometer for ten years, i. e. from 1825 *to* 1834 *inclusive, with the quantity of rain in inches, the prevailing winds, the dry and wet days during that period ; being extracts from journals kept at the Devon and Exeter Institution and Lunatic Asylum.*

JANUARY.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	54	30	42.66	30.90	29.30	30.20	2.50	N.E.	22	9
1826	49	21	37.70	30.45	29.48	29.94	2.39	E.	23	8
1827	51	25	39.48	30.26	29.50	29.85	1.97	N.W.	11	20
1828	57	29	43.69	30.46	29.25	29.90	5.41	S.W.	17	14
1829	52	21	33.90	30.20	29.00	29.77	2.02	N.E.	21	10
1830	44	19	32.79	30.56	29.34	29.96	2.14	N.W.	18	13
1831	50	22	37.72	33.55	29.10	29.43	3.11	N.	16	15
1832	52	27	40.41	30.42	29.20	29.91	1.31	N.	21	10
1833	47	25	36.64	30.55	29.40	29.85	2.01	N.E.	22	9
1834	56	32	45.69	30.34	29.07	29.69	7.08	S.E.	10	21
Means and extremes	51.2	25.1	39.00	30.46	29.26	29.85	29.85	N.E.	18.1	12.9

FEBRUARY.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	53	31	42.44	30.45	29.60	30.12	2.15	W.	19	9
1826	55	33	46.35	30.40	29.30	29.90	4.23	S.W.	13	15
1827	51	22	35.60	30.50	29.50	29.99	1.14	E.	25	3
1828	58	27	43.91	30.50	29.20	29.80	3.30	W.	14	15
1829	55	28	42.66	30.50	29.36	30.01	1.64	W.	19	9
1830	57	17	38.16	30.30	29.40	29.88	0.92	W.	16	12
1831	58	24	42.55	30.40	29.00	29.83	3.12	W.	14	14
1832	55	27	39.81	30.50	29.20	30.09	0.84	N.	21	8
1833	55	31	43.51	29.90	28.80	29.49	7.81	W.	8	20
1834	55	28	42.37	30.44	29.70	30.12	4.70	S.W.	15	13
Means and extremes	55.2	26.8	41.70	30.38	29.30	29.91	26.85	W.	16.4	11.8

March.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	59	32	44.61	30.60	29.20	30.05	2.98	E.	25	6
1826	60	32	45.16	30.36	29.40	29.93	2.67	N.E.	18	13
1827	58	29	46.50	30.27	29.06	29 98	4.07	W.	9	22
1828	62	30	46.54	30.30	29.10	30.24	1.25	N.E.	19	12
1829	57	28	41.20	30.30	29.16	29.76	2.46	E.	22	9
1830	63	34	47.17	30.54	29.55	30.08	0.83	W.	22	9
1831	58	31	45.61	30.38	29.18	29.84	2.33	W.	10	14
1832	56	28	43.83	30.33	29.33	29.89	2.62	N.W.	15	16
1833	54	25	38.35	30.30	29.10	29.82	1.76	N.W.	19	12
1834	59	30	46.19	30.50	29.70	30.29	0.81	W.	21	10
Means and extremes	58.6	29.9	44.40	30.38	29.27	29.28	21.78	N,W.	18.7	12.3

April.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	63	36	51.16	30.40	29.20	30.27	2.15	S&NE.	21	9
1826	64	35	52.03	30.34	29.30	29.99	0.88	N.W.	20	10
1827	65	32	51.08	30.20	29.40	29.91	1.68	E.	21	9
1828	66	32	49.18	30.20	29.16	29.79	3.73	W.	12	18
1829	58	31	44.21	30.00	29.04	29.50	5.92	W.	7	23
1830	65	27	49.53	30.13	29.30	29.71	2.93	W.	18	12
1831	63	35	49.86	30.42	29.07	29.35	2.95	N.	21	9
1832	65	34	47.60	30.50	29.30	29.98	1.28	S.E.	21	9
1833	60	32	46.00	30.24	28.84	29.75	3.44	W.	12	18
1834	65	31	47.26	30.50	29.20	30.14	0.97	E.	25	5
Means and extremes	63.4	32.5	48.70	30.29	29.18	29.83	25.85	N.W.	17.8	12.2

May.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	68	45	55.25	30.20	29.50	29.89	2.53	N.E.	16	15
1826	78	35	53.59	30.30	29 66	30.00	1.99	N.E.	20	11
1827	68	37	54.74	30.10	29.30	29.44	2.92	W.	13	18
1828	71	40	54.96	30.20	29.20	29.81	3.27	S.E.	8	23
1829	74	40	57.33	30.40	29.60	30.00	0.79	S.E.	23	8
1830	72	40	55.14	30.16	39.35	29.82	2.56	S.E.	17	14
1831	73	33	54.69	30.16	29.40	29.85	1.49	E	17	14
1832	73	37	54.03	30.46	29.27	29.91	1.81	N.W.	24	7
1833	77	38	57.00	30.40	29.40	30.05	0.62	S.	27	4
1834	74	39	56.74	30.44	29.48	30.00	1.23	S.	22	9
Means and extremes	72.8	38.4	55.30	30.28	29.50	29.87	19.21	S.E.	18.7	12.3

JUNE.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	83	45	59.91	30.30	29.40	29.96	1.18	W.	16	14
1826	84	50	67.76	30.40	29.90	30.20	0.35	N.W.	23	7
1827	77	45	58.95	30.30	29.62	29.94	1.11	W.	17	13
1828	82	50	61.45	30.30	29.55	30.00	3.63	S.E.	18	12
1829	76	44	59.75	30.34	29.33	30.00	4.58	N.W.	16	14
1830	73	43	57.75	30.10	29.40	29.86	3.61	W.	15	15
1831	75	47	61.08	30.20	29.72	29.90	0.95	N.W.	14	16
1832	80	43	59.56	30.36	29.44	29.90	2.32	W.	20	10
1833	73	43	57.96	30.30	29.40	29.80	5.11	W.	8	22
1834	74	45	59.13	30.30	29.60	29.98	2.95	S.	17	13
Means and extremes	77.7	45·5	60.30	30.29	29.53	29.95	25.79	W.	16.4	13.6

JULY.

Years,	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825*	94	48	66.06	30.30	29.80	30.11		N.E.		
1826	83	54	67.43	30 30	29.64	29.97	1.03	W.	19	12
1827	81	51	65.38	30.44	29.69	30.08	1.47	W.	22	9
1828	76	45	61.22	30.06	29.24	29.71	4.50	S.W.	6	25
1829	76	46	61.09	30.20	29.30	29.78	5.61	S.	8	23
1830	84	47	62.98	30.30	29.50	29.42	2.26	W.	14	17
1831	81	48	63.30	30.30	29.60	29.97	2.17	N.E.	21	10
1832	80	48	62.77	30.35	29.70	30.09	1.54	S.	25	6
1833	80	46	61.83	30.43	29.70	30.02	0.77	N.W.	20	11
1834	81	48	63.41	30.26	29.60	29.96	3.30	W.	13	18
Means and extremes	81.6	48.1	63.60	30.29	29.56	29.91	22.70	W.	14.8	13.1

AUGUST.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	83	54	64.56	30.30	29.60	29.99	1.29	W.	15	16
1826	83	52	65.74	30.30	29.55	29.96	2.50	S.W.	20	11
1827	74	48	61.83	30.46	29.38	30.00	2.29	N.E.	16	15
1828	76	45	61.20	30.30	29.30	29.82	2.59	W.	11	20
1829	74	40	59.98	30.22	29.44	29.90	2.69	N.W.	14	17
1830	74	41	60.43	30.24	29.30	29.88	3.07	N.W.	11	20
1831	82	53	64.93	30.30	29.56	29.95	1.80	N.W.	15	16
1832	80	48	62.16	30.28	29.20	29.85	5.10	S.W.	19	12
1833	73	43	59.82	30.40	29.22	30.00	0.60	W.	26	5
1834	77	42	62.11	30.16	29.55	29.88	2.15	S.	13	18
Means and extremes	77.6	46.6	62.20	30.29	29.41	29.92	24·08	W.	16.0	15.0

* On the 19th, (1825,) thermometer 130 in the sun at noon; 132 in the sun at three, p.m.; 93½ in the shade.

September.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	76	48	65.15	30.29	29.55	29.83	2.79	W.	18	12
1826	72	46	61.33	30.20	29.30	29.87	5.29	W.	18	12
1827	72	44	59.26	30.30	29.47	29.95	4.15	W.	17	13
1828	73	42	60.23	30.90	29.07	29.56	3.42	S.W.	17	13
1829	68	39	54.48	30.20	29.16	29.79	5.43	S.W.	11	19
1830	70	41	55.08	30.30	29.20	29.78	3.29	W.	11	19
1831	70	45	56.06	30.26	29.40	29.91	2.17	N.W.	14	16
1832	69	40	46.56	30.40	29.60	30.09	0.38	W.	28	2
1833	68	37	55.00	30.30	29.30	29.93	1.98	W.	12	18
1834	73	39	56.56	30.46	29.46	30.06	1.96	W.	20	10
Means and extremes	7..1	42.1	56.90	30.36	29.35	29.87	30.86	W.	16.6	13.4

October.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	68	38	54.83	30.28	29.49	29.95	4.03	W.	14	17
1826	68	38	57.64	30.19	29.44	29.88	3.40	W.	13	18
1827	64	35	53.06	30.30	29.00	29.70	6.02	S.W.	13	18
1828	64	35	52 91	30.38	29 60	30.05	2.21	W.	19	12
1829	63	33	50.37	30.40	29.55	30.01	1.21	W.	21	10
1830	66	36	53.24	30.47	29.36	30.17	0.50	S.E.	20	11
1831	67	42	55.79	30.30	29.20	29.79	5.52	S.	11	20
1832	65	37	50.98	30.30	29.29	30.03	4.00	S.	22	9
1833	62	36	51.74	30.20	29.20	29.77	3.34	S.	15	16
1834	67	32	52.35	30.63	29.50	30.07	1.25	S.	22	9
Means and extremes	65.4	36.2	53.20	30.34	29.36	29.94	31.48	S.	17.0	14.0

November.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min	Mean.	Max.	Min.	Mean.			Dry	Wet
1825	59	30	45.96	30.30	29.13	29.71	2.85	W.	16	14
1826	57	29	43.62	30.46	29.20	29.82	2.36	N.W.	15	15
1827	60	27	48.56	30.40	29.40	29.98	2.37	W.	17	13
1828	59	27	48.58	30.26	29.20	29.83	3.09	W.	15	15
1829	58	25	41.43	30.35	29.60	29.96	1.03	N.E.	20	10
1830	60	30	46.71	30.36	29.60	29.75	5.55	S.	15	15
1831	61	30	46.13	30.50	29.50	29.92	3.49	N.W.	12	18
1832	61	30	45.33	30.40	29.45	29.80	5.72	W.	10	20
1833	61	29	46.40	30.24	29.90	29.94	3.15	N.W.	16	14
1834	60	30	43.48	30.44	29.30	29.92	2.22	N.E.	19	11
Means and extremes	59.6	28.7	45.50	30.37	29.26	29.86	31.83	N.W.	15.5	14.5

DECEMBER.

Years.	Register Therm.			Barometer.			Rain in inches.	Prevailing winds.	Days.	
	Max	Min.	Mean.	Max.	Min.	Mean.			Dry	Wet
1825.....	56	25	43.43	30.10	29.10	29.51	4.27	E.	13	18
1826.....	56	32	46.00	30.53	29.40	29.57	3.48	W.	12	19
1827.....	59	33	47.30	30.60	29.20	29.53	4.04	S.W.	14	17
1828.....	58	30	46.91	30.29	29.05	29.89	3.96	S.W.	12	19
1829.....	52	21	35.96	30.46	29.63	30.04	0.71	N.E.	21	10
1830.....	52	16	37.82	30.42	28.80	29.59	5.05	N.W.	11	20
1831.....	58	29	44.24	30.40	29.10	29.74	5.78	S.W.	12	19
1832.....	58	31	43.45	30.46	29.55	29.94	3.37	W.	15	16
1833.....	58	32	46.62	30.14	29.35	29.78	4.66	W.	4	27
1834.....	56	31	42.64	30.60	29.40	30.36	1.04	N.	23	8
Means and extremes	56.3	31.0	43.40	30.40	29.25	29.79	36.36	N.W.	13.7	17.3

[THE CONCLUDING PORTION OF THESE APPENDIXES WILL BE PUBLISHED IN A FUTURE VOLUME.]

A GEOLOGICAL MAP of the Country around CHELTENHAM.

Ledbury
Tewkesbury
Winchcombe
Newent
Cheltenham
Churchdown
Gloucester
Sevenhampton
Northleach
Westbury
Newnham
Painswick
Stroud
RIVER SEVERN
Minchinhampton

Great Oolite.
Inferior Oolite.
Lias.
New Red Sandstone.
Coal.
Old Red Sandstone.
Mountain Limestone.
Trilobitic Limestone.

Fairland Lithog

London Published by John Churchill Princes St Soho.

ARTICLE IV.

THE

MEDICAL TOPOGRAPHY AND STATISTICS

OF

CHELTENHAM.

BY D. W. NASH, ESQ.

Of the Bengal Medical Staff.

THE interest which at present attaches to the subject of statistics in all its branches, and the favourable light in which communications on Medical Topography and Medical Statistics are regarded by the Provincial Medical and Surgical Association, have induced me to offer a brief outline of the Medical Topography of the town of Cheltenham, the rather that from the circumstance of the last annual meeting of the Association having taken place at Cheltenham, many of the local features of the spot will be fresh in the recollection of the members of the Society.

The many difficulties which lie in the way of procuring extensive and accurate information on all the subjects which should, in an essay of this nature, be brought under consideration, can only

be overcome by constant and persevering research, aided by a lengthened residence in the spot of which the statistics are to be developed; the want of this latter advantage must excuse the meagre character of the following details.

In accordance with the plan usually adopted in such communications as the present, the history of Cheltenham may be considered under two heads,—the natural-historical and the statistical.

PART I.—THE NATURAL HISTORY OF CHELTENHAM.

Cheltenham is situated in north lat. 51°.51′, and west long. 2°.5′, at the foot of a portion of the Cotswold range of hills, which shelter it on the north-east, east, and south-east; leaving it exposed, on the western and south-western side, to the great valley of the Severn, which opens into the Bristol Channel. The town is nine miles distant from Gloucester, forty-four from Bristol, forty from Oxford, and ninety-four and a half from London.

Cheltenham covers a considerable extent of ground, and is composed, for the most part, of wide and airy streets, which, in the newer parts of the town, are planted with trees. It possesses, in its very centre, numerous delightful walks leading to the various spas. The oldest portion of the town, or High-street, and the streets and squares in its immediate vicinity, as well as the more recently built portions inhabited by the lower orders, lie on a nearly level plain. To the south is a slight elevation, the first ascent of the Cotswold Hills, called Lansdown, thickly covered with houses, chiefly of

a superior order. To the north, at a somewhat greater distance from the centre, is a similar elevation called Marle Hill, on the slope of which is situated the Pittville Spa, and which is destined, at some future period, to become the site of a new district of the town of Cheltenham. The main body of the town, therefore, lies in an extensive basin, open on the south and south-west; this basin is 195 feet above the level of the sea, and 135 feet above the level of the city of Gloucester. Though almost surrounded by hills, it is far from being placed in a low situation.

The Cotswold Hills, which form the eastern boundary of that portion of the valley of the Severn called the Vale of Gloucester, are, in some places, as at Cleeve Hill, which is four miles from Cheltenham, 1134 feet above the level of the sea. They terminate somewhat abruptly on their western face, and sometimes in very steep escarpments. Their summits present extensive undulations, and stretch over a district of 200,000 acres, which is formed into large farms and great sheep pastures, long famous for the excellency of the mutton which they produce. The vetch called saintfoin, *Onobrychis sativa,* is cultivated on these hills more extensively than in any other part of England. In appearance they are by no means prepossessing, being almost destitute of trees, and quite devoid of hedges; the surface is covered by shingly fragments of limestone, and all the fences are formed of the same material. These hills are remarkable as being the site of numerous ancient remains, both Roman and British, erected, most probably, to guard against

the incursions of the Silures. The Ermine-street, or rather that portion of it connecting Glevum or Gloucester with Corinium or Cirencester, crossed the Cotswold Hills near Birdlip and Witcomb, at which latter place are the remains of a large Roman villa. Remains of a British fortress are visible on Leckhampton Hill, and of a Roman military station on that of Dowdeswell.

The soil of the valley at the foot of these hills is a sandy loam, lying on a stiff blue clay, very retentive of moisture, and requiring much drainage. In the town itself, this clay is, in many places, covered to the depth of several feet by fine sands and gravels, the detritus of the neighbouring hills. The houses thus located, are necessarily much more dry than those seated on the clay itself.

The valley is very fertile, and forms fine pasturages and numerous dairy farms, which produce the celebrated Gloucester cheese. It is well wooded with apple, pear, and elm trees; but the beech, which grows so abundantly on the limestone soil of the hills as to be there called "the weed of the country," is rarely seen in the vale.

The only stream which flows near Cheltenham is the Chelt, a small brook of no importance otherwise than as a common sewer, which, rising in the Cotswold Hills, runs through the town, westward, to empty itself into the Severn. This latter river is distant seven miles in a straight line.

Three miles from Cheltenham, in the parish of Coberley, are the seven springs which form the source of the river Thames.

Geology.—The geological formations which are to be met with in the neighbourhood of Cheltenham, are sufficiently diversified to afford ample scope to the labours of the geologist. Situated at the foot of the Cotswold range, it is in the immediate vicinity of no less than eight great formations. The Cotswold Hills themselves are composed of an oolitic limestone, forming that member of the great oolitic series called the inferior or ferruginous oolite. The stratum on which the town immediately rests, leaving out of consideration the sands and gravel before mentioned, is the blue clay of the lias formation. At Coombe Hill, five miles from Cheltenham, the new red sandstone appears; and at Sevenhampton, in the opposite direction, the Stonesfield slate, a member of the great or Bath oolite, is found superimposed upon the inferior oolite.

On the farther or western bank of the Severn, the new red sandstone borders on the great coal district of the Forest of Dean, and the mountain limestone and old red sandstone are found forming the boundaries of the coal basin in the same locality.

To the north-west, within view of the town, rise the igneous rocks of the Malvern Hills, composed principally of greenstone; and in this neighbourhood, near Ledbury, may be observed a small tract of that transition limestone which, from the nature of its organic contents, has been called trilobitic limestone. Eight different formations, then, are within reach of the geologist at Cheltenham; but those more immediately in the neighbourhood are two only, the lias and the inferior oolite.

Lias.—This formation, emerging from beneath the inferior oolite, is bounded on its eastern edge by the latter throughout its whole course, with but little exception, from Whitby, in Yorkshire, to Lyme Regis, in Dorsetshire. It forms the subsoil of the entire country around Cheltenham, and, indeed, of nearly the whole valley of Gloucester, between the hills and the river Severn. Mr. Murchison has divided the lias formation in this neighbourhood into three sub-groups:—1. The upper lias or alum shale.—2. Marlstone.—3. Lower lias shale.

The upper lias is seen along the base of the escarpments of the Cotswolds, forming their lower slope; the lower lias is that which forms the soil of the whole valley. The intermediate sub-group, or marlstone, is made up of clays, sandstones, and impure limestone, the latter generally of a dark blue colour, intermixed with thin strata of shale. The marlstone forms the summit of a curious outlier of the Cotswold Hills, called Churchdown Hill, an isolated elevation of the lias, 500 feet in height, having, on its summit, a superficial covering of sandy loam, containing spheroidal concretions of hard calcareous grit, which testify to the former existence of a stratum of inferior oolite. These concretions, which, from their shape and general appearance, are called by the workmen "*mens' heads*," are stated by Mr. Murchison to be similar to those which mark the lines of stratification in the inferior oolite in the cliffs on the coast near Bridport, Dorsetshire. This outlier, Churchdown, is distant about three miles from the hills, with which it was once connected, the whole of the intervening

mass having been washed away. This is one of the numerous examples of denudation which are to be met with in the vale of Gloucester. The marlstone also appears near the summit of Battledown, a small elevation separated from the Cotswolds by a narrow valley of denudation.

The presence of the blue clay of the lias is indicated around Cheltenham by the numerous brick-yards to which it gives origin. It abounds in gryphites, ammonites, belemnites, &c., and contains considerable quantities of pyrites. In various places on the Gloucester and Tewkesbury roads, a dark blue limestone, belonging to this formation, is quarried for the purposes of building, burning for lime, and road mending. It is called by the workmen *claystone*.

The lias, though in some localities so fertile in the most highly-prized organic remains, has not yet furnished the Museum of our town with many valuable specimens, a circumstance to be attributed to the absence of cliffs, deep water-courses, or extensive quarries in this formation in our neighbourhood. A thin seam of lignite has lately been discovered in the lias in this vicinity.

Inferior Oolite.—This, the lowest member of the great oolitic series, rising from beneath the more recent deposits of their group, which may be seen at Sevenhampton, forms the eastern boundary of the lias, and of the vale of Gloucester. It constitutes the superior mass of the Cotswold Hills, rising to the height of 1134 feet. The base of these hills is formed of the upper lias and marlstone. The western face of this formation is a steep slope, in

some places precipitous, though the base has been marked by the detritus carried down by rain and torrents. To the east it slopes away in extensive undulations, until it dips under the strata of the great oolite. Near Cheltenham this rock consists of the distinct sub-divisions, which are well displayed at Leckhampton Hill, where it is extensively quarried for various economical purposes. The upper beds, called *gryphite grit* by Mr. Murchison, from its abounding in gryphœæ, are used for road mending; as are also the lower beds called in the country *pea grit,* a coarse concretionary rock made up of large flat grains. The central beds are of a fine-grained oolite limestone, exactly similar in colour and quality to the famous building stone of Bath, easily worked in the quarry, but becoming hard on exposure to the air.

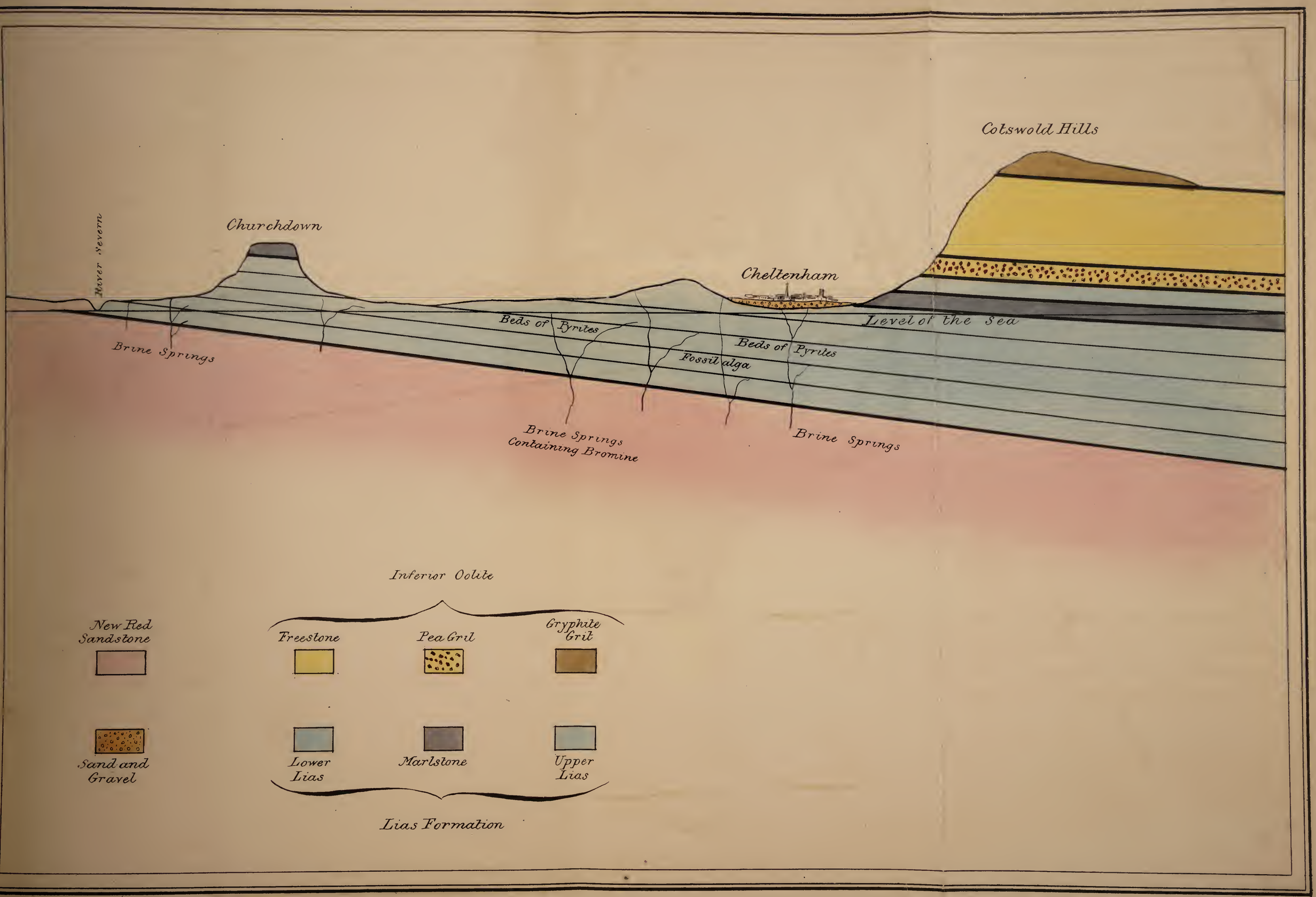
The inferior oolite has evidently at one period extended much farther to the westward than the present ridge of the Cotswold Hills; its remains are visible in its outliers of Churchdown, Oxenton, and Bredon Hills, which have withstood the unknown cause of denudation that has laid bare the lias, and hollowed out the present valley of the Severn.

The following is a list of the principal organic remains of the neighbourhood, most of which are contained in the Museum of the Literary and Philosophical Institution of this town.

FROM THE LIAS.

Ammonites Walcottii	Ammonites communis
undulatus	amaltheus
annulatus	Cheltiensis
heterophyllus	Avicula inequivalvis

SECTION of the Vale of GLOUCESTER from the COTSWOLD HILLS to the RIVER SEVERN.



Fairland lithog

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Belemnites acutus
tubularis
penicillatus
abbreviatus
sulcatus
elongatus
Cardium truncatum
Crenatula ventricosa
Cucullæa elongata
Gryphœa incurva
gigantea
Gryphœa obliquata
Hippopodium ponderosum
Inoceramus dubius
Lima antiqua
Nautilus lineatus
striatus
truncatus
Plicatula spinosa
Plagiostoma gigantea
antiquata
Serpula sulcata
Terebratula ornithocephala
Turritella muricata
Trochus bisectus
imbricatus
Anglicus
Dorsal vertebræ of the icthyosaurus

FROM THE INFERIOR OOLITE.

Ammonites Brownii
corrugatus
elegans
Belemnites compressus
Berenicea diluviana
Cirrus carinatus
Clypeus sinuatus
Gryphœa Cymbium
Gervillia ———
Isocardia concentrica
costata
Mya calciformis
Modiola plicata
gibbosa
Nautilus obesus
Ostrœa Marshii
solitaria
Pentacrinites scalaris
Pholadomya Fidicula
ambigua
Pholadomya obtusa
Pecten demissus
Plagiostoma punctata
cardiformis
gigantea
Parkinsonii
Terebratula perovalis
fimbria
obsoleta
media
emarginata
globata
Trochus arenosus
fasciatus
Trigonia clavellata
costata
striata
Unio abductus
Nodules of hydrated oxide of iron

The most important circumstance connected with the geology of Cheltenham is the presence of those mineral waters to which it owes, if not its existence, at least its progressive advance from a petty village to a populous and flourishing town.

These waters exist not only at Cheltenham, but also at Gloucester, Tewkesbury, Leamington, and throughout the whole of the lias formation generally, differing in the relative quantities of their constituents in the various localities. In the town of Cheltenham itself there are above one hundred wells, which supply the daily consumption of water by invalids, and the manufactory of Cheltenham salts.

The origin of the saline matters which these waters contain, is, no doubt, to be found in the great new red sandstone formation which underlies the lias, and which is so well known in Worcestershire, Cheshire, and Lancashire, as a saliferous deposit.*

The waters thus originating, meet with beds of iron pyrites and other mineral substances in their passage upwards through fissures in the lias, and thus local circumstances produce local differences in the constitution of each mineral water. The presence of iodine and bromine in these waters, a late discovery by Dr. Daubeny, is by him referred to the same source.

The principal ingredients of these mineral waters are—sulphates and carbonates of soda, magnesia, and lime, muriates of soda and magnesia, iron, free carbonic acid and sulphuretted hydrogen gas, and hydriodate and hydrobromate of soda.

* Vide section, No. 1.

As numerons treatises are in existence containing analyses of the Cheltenham waters, I shall not do more in this place than give the composition of the saline aperient water most usually employed, and that of the strongest ioduretted water.

Pure Saline Water.—No. 4.

Specific gravity	1.009

GASEOUS CONTENTS IN A PINT.

Carbonic acid gas	1.4 cubic inches

SALINE CONTENTS.

Muriate of soda	52.4 grs.
Sulphate of magnesia	14.2
..... soda	17.2
..... lime	2.7
Carbonates of lime and magnesia	1.1
	87.6

Ioduretted Saline.—No. 4.

Specific gravity	1.009

GASEOUS CONTENTS IN A PINT.

Carbonic acid gas	1.2 cubic inches

SALINE CONTENTS.

Sulphate of magnesia	47.0 grs.
..... lime	3.1
Muriate of magnesia	10.5
..... lime	13.1
..... soda	9.7
Bicarbonate of soda	1.7
Oxide of iron	0.4
Hydriodate of soda, with a very small quantity of hydrobromate of soda	0.35
	85.85

This water contains more than one-fourth of a grain of iodine in every pint of water, and is the strongest ioduretted water hitherto discovered.

In another spring, at Pittville, about one mile distant from the last mentioned, the presence of iodine is rarely appreciable, while bromine exists in the proportion of one-fiftieth of a grain to the pint of water.

It cannot but be considered a remarkable circumstance that, in a tract of country so circumscribed as that within which these springs are found, mineral waters, all emerging from the same geological formation, and having, to all external appearance, the same mineralogical relations, should present such remarkable differences in their nature and composition. I have already said that the origin of the saline matters is no doubt in general, the saliferous sandstone; magnesian salts being produced by local beds of dolomite or dolomitic conglomerate, in places where the new red sandstone is wanting; oxide of iron and sulphuretted hydrogen gas, from beds of pyrites deposited in the lias clay. Bromine, which is known to exist in sea water in considerable quantity, is to be referred to the great brine deposits of the new red sandstone. But as iodine barely exists in the waters of the ocean, its origin can hardly be traced to the saline beds which afford the bromine; and in a pamphlet on the "Ioduretted Waters of Cheltenham," I have remarked that the source of the former mineral may with probability be referred to local beds of fossil *algæ* and *fucoidæ*, deposited in the lias,—these organic matters being at present the most fertile sources of iodine.

Botany.—The following list of plants, indigenous to the neighbourhood of Cheltenham, will sufficiently point out its botanical features. The greater part have been collected in the pasturages of the vale, which furnish an extremely luxuriant vegetation.

Ranunculaceæ.
Anemone nemorosa
Aquilegia vulgaris
Caltha palustris
Delphinium Consolida
Ranunculus aquatilis
sceleratus
Ficaria
auricomus
acris
bulbosus
arvensis
Berberideæ.
Berberis vulgaris
Nymphœaceæ.
Nuphar lutea
Papaveraceæ.
Papaver Argemone
Rhœas
Chelidonium majus
Fumariaceæ.
Fumaria officinalis
capreolata.
Cruciferæ.
Arabis hirsuta
Barbarea vulgaris
Capsella Bursa-pastoris
Cardamine pratensis
hirsuta
amara
Cheiranthus Cheiri
Coronopus Ruellii
Cochlearia Armoracia
Brassica Rapa
Draba verna
Iberis amara
Erysimum Alliaria
Sinapis arvensis
Nasturtium officinale
Raphanus Raphanistrum
Sisymbrium officinale
Thlaspi alpestre
arvense
Violaceæ.
Viola odorata
canina
tricolor
Cistineæ.
Helianthemum vulgare
Polygaleæ.
Polygala vulgaris
Malvaceæ.
Malva sylvestris
rotundifolia
Althœa officinalis
Hypericineæ.
Hypericum hirsutum
Androsæmum
perforatum

Caryophylleæ.
Agrostemma Githago
Arenaria trinervis
serpyllifolia
Cerastium arvense
aquaticum
Lychnis Flos Cuculi
dioica
Stellaria media
holostea
graminea
Lineæ.
Linum catharticum
Acerineæ.
Acer Pseudo-platanus
Geraniaceæ.
Geranium dissectum
pratense
Robertiana
Oxalideæ.
Oxalis Acetosella
Crassulaceæ.
Sedum acre
Telephium
Sempervivum tectorium
Saxifrageæ.
Chrysosplenium oppositifolium
Adoxa Moschatellina
Celastrineæ.
Euonymus Europeus
Leguminosæ.
Cytisus scoparia
Lathyrus pratensis
Vicia sativa
sylvatica
Cracca
angustifolia
Trifolium repens
medium
pratense
Lotus villosus
corniculatus
tenuis
Genista tinctoria
Ononis arvensis
Anthyllis vulneraria
Onobrychis sativa
Melilotus officinalis
Ulex Europeus
Lathyrus Nissolia
Rosaceæ.
Spiræa Ulmaria
Prunus spinosus
Potentilla Fragariastrum
anserina
reptans
Tormentilla officinalis
Geum urbanum
Poterium Sanguisorba
Agrimonia Eupatoria
Pomaceæ.
Cratægus Oxyacanthus
Pyrus Malus
Grossulaceæ.
Ribes rubrum
Grossularia
Onograriæ.
Epilobium montanum
hirsutum
parviflorum
tetragonum
Umbelliferæ
Anthriscus vulgaris
Bunium flexuosum

Æthusa Cynapium
Scandix Pecten
Heracleum Sphondylium
Heliosciadium nodiflorum
repens
Sium latifolium
Œnanthe fistulosa
Dancus Carota
Conium maculatum
Apium graveolens
Pastinaca sativa
Torilis nodosa

Chenopodiaceæ.

Chenopodium olidum
rubrum
glaucum
BonusHenricus
ficifolium
album

Stellatæ.

Galium Aparine
cruciatum
Sherardia arvensis
Asperula odorata

Caprifoliaceæ.

Cornus sanguinea
Lonicera Periclymena
Viburnum Lantana
Opulus
Sambucus nigra
Ebulus
Hedera Helix

Campanulaceæ.

Campanula latifolia
rotundifolia

Dipsaceæ.

Dipsacus Fullonum
Dipsacus sylvestris
Knautia arvensis

Compositæ.

Leontodon Taraxacum
Tussilago Farfara
Petasites vulgaris
Senecio vulgaris
Jacobœa
Bellis perennis
Tragopogon porrifolium
Picris hieracioides
Apargia hispida
Artemisia vulgaris
Absinthium
Conyza squarrosa
Cnicus lanceolatus
palustris
arvensis
acaulis
Cichorium Intybus
Sonchus asper
Tanacetum vulgare
Arctium Lappa
Serratula tinctoria
Carduus nutans
acanthoides
Eupatorium cannabinum
Gnaphalium Germanicum
Chrysanthemum segetum
Leucanthemum
Parthenium
Matricaria Chamomilla
Anthemis arvensis
Cotula
Centaurea nigra
Cyanus
Scabiosa

Hieracium Halleri
Lapsana communis
Borragineæ.
Lithospermum arvense
officinale
Echium vulgare
Symphytum officinale
Myosotis palustris
arvensis
versicolor
Lycopsis arvensis
Oleineæ.
Ligustrum vulgare
Fraxinus excelsior
Apocyneæ.
Vinca major
minor
Solaneæ.
Solanum Dulcamara
nigrum
Atropa Belladonna
Verbascum Thapsus
Primulaceæ.
Lysimachia vulgaris
Anagallis arvensis
Gentianeæ.
Erythrea Centaurium
Scrophularineæ.
Bartsia Odontites
Euphrasia officinalis
Veronica montana
officinalis
spicata
serpyllifolia
Chamœdrys
hederifolia
agrestis
Veronica arvensis
Beccabunga
Pedicularis palustris
Antirrhinum majus
Linaria Elatine
Cymbalaria
Scrophularia aquatica
Digitalis purpurea
Rhinanthus Crista Galli
Scrophularia nodosa
Scorodonia
Labiatæ.
Ajuga reptans
Galeobdolon luteum
Lamium album
purpureum
amplexicaule
Glecoma hederacea
Thymus Serpyllum
Galeopsis versicolor
Betonica officinalis
Stachys ambigua
palustris
sylvatica
Teucrium Scorodonia
Calamintha officinalis
Nepeta Cataria
Mentha hirsuta
arvensis
Prunella vulgaris
Marrubium vulgare
Origanum vulgare
Polygoneæ.
Rumex Acetosa
Acetosella
Polygonum aviculare
aquaticum

Polygonum Persicaria
Hydropiper
minus
Convolvulus
Urticeæ.
Parietaria officinalis
Urtica dioica
urens
Humulus Lupulus
Euphorbiaceæ.
Buxus sempervirens
Mercurialis perennis
Euphorbia platyphylla
helioscopia
Peplis
exigua
amygdaloides
Ulmaceæ.
Ulmus campestris
Cupuliferæ.
Fagus sylvatica
Quercus Robur
Corylus Avellana
Cornus sanguinea
Amentaceæ.
Populus tremula
alba
Betula alba
Alnus glutinosa
Salix triandra
Orchideæ.
Habenaria viridis
Epipactis latifolia
Listera ovata
Orchis Morio
mascula
latifolia
maculata
Callitrichineæ.
Callitriche verna
autumnalis
Melanthaceæ.
Colchicum autumnale
Smilaceæ.
Paris quadrifolia
Tamus communis
Butomeæ.
Butomus umbellatus
Cucurbitaceæ.
Bryonia dioica
Cyperaceæ.
Carex vulpina
strigosa
pseudocyperus
panicea
Scripus sylvaticus
Gramineæ.
Anthoxanthum odoratum
Festuca Myurus
bromoides
ovina
rubra
Poa distans
trivialis
nemoralis
fluitans
pratensis
annua
Bromus sterilis
mollis
arvensis
erectus
asper
Phleum asperum
pratense

Agrostis vulgaris
setacea
Alopecurus pratensis
agrestis
bulbosus
Arrhenatherum avenaceum
Holcus mollis
lanatus
Briza media
Dactylis glomerata
Milium effusum
Phalaris canariensis
Cynosurus cristatus
Lolium perenne
arvense
Hordeum pratense
murinum
Triticum caninum
loliaceum
repens
Melica cærulea
Brachypodium sylvaticum

Equisetaceæ.

Equisetum fluviatile
arvense
palustre

In addition to these plants, indigenous to the neighbourhood, the cultivated gardens within the town exhibit a great number of the more tender exotics flourishing in the open air, among which are the—

Buddlœa globosa
Magnolia tripetala
Lobelia tricolor
Dahlia, many kinds
Geranium, ditto
&c. &c.

Meteorology and Climate.—The remarks already made on the geological characters of the country around Cheltenham, and on the particular locality of the town itself, will readily explain the peculiarities of its climate. Situated on a slight elevation above the level of the sea, and sheltered on all sides but the west and south-west, by the neighbouring hills, it necessarily enjoys a mild and equable climate. Much has been said on the subject of the climate of Cheltenham by various local writers, but the most accurate method of obtaining

the truth on this point, will be an examination of the following registers, which have been carefully kept for many years by Mr. Moss of Cheltenham, a member of the Meteorological Society of London.

Annual mean temperature at Cheltenham and Edmonton during seven years.

Years.	Cheltenham.	Edmonton.
1829	47.97	46.80
1830	49.53	48.21
1831	52 21	50.36
1832	51.37	48.60
1833	50.30	49.40
1834	51.15	51.22
1835	49.30	49.96
Annual mean of seven years	50 26	49.22

Monthly mean temperature at Cheltenham during seven years.

	1829.	1830.	1831.	1832.	1833.	1834.	1835.
January.....	34.00	32.15	36.47	40.20	36.65	47.15	35.24
February.....	41.26	36.85	42.70	39.90	43.69	43.17	42.37
March	41.73	48.40	46.52	44.60	39.88	45.40	42 28
April	46.90	50.39	49.63	49.77	48.37	46.63	48.32
May	56.38	55.45	54.15	54.25	59.26	56.20	52.50
June	54.80	58.80	61.30	60.30	58.08	59.13	59.81
July	63.55	63.06	63.36	62.50	60.07	61.76	62.74
August	59.00	58.24	64.47	61.11	57.64	59.98	62.64
September...	53.76	55.09	58.08	58.51	54.30	58.39	56.21
October	48.09	52.36	57.33	53.33	51.50	50.75	48.73
November ...	41.10	46.76	46 38	47.75	47.21	43.57	43.92
December ...	35.11	36.76	46.08	44.27	46.94	41.69	36.92

Mean temperature of the seasons at Cheltenham and Edmonton.

Years.	CHELTENHAM.				EDMONTON.			
	Spring.	Summer	Autumn	Winter.	Spring.	Summer	Autumn	Winter.
1829	49.05	59.17	47.43	37.63	47.54	60.25	46.00	36.87
1830	51.92	60.65	50.92	34.50	50.41	60.21	49.39	32.66
1831	50.33	62.88	52 23	41.27	50.16	62.30	48.30	36.78
1832	49.42	61.40	53.13	42.08	47.02	59.60	48.93	38.19
1833	49.57	58.85	50.75	41.79	48.97	59.27	49.25	39.97
1834	50.30	60.44	50.98	44.42	52.19	63.27	47.41	43.38
1835	47.39	61.27	50.06	38.80	48.12	65.36	49.72	37.72
Mean of 7 years	49.65	60.86	50.28	40.92	49.60	62.31	48.86	38.02

Difference of mean temperature of summer and winter at Cheltenham and Edmonton.

	Summer.	Winter.	Difference.
Cheltenham	60.86	40.92	19.94
Edmonton..	62.31	38.02	24.29
Difference between the two places			4.35°

Difference of the mean temperature of successive seasons at Cheltenham and Edmonton.

	Winter and Spring.	Spring and Summer.	Summer and Autumn.	Autumn and Winter.
Cheltenham...	8.73	11.21	10.58	9.36
Edmonton	11.58	12.71	13.45	10.84

Difference of mean temperature of the warmest and coldest months at Cheltenham and Edmonton.

Years.	CHELTENHAM.			EDMONTON.		
	Warmest month.	Coldest month.	Difference	Warmest month.	Coldest month.	Difference
1829	63.55	34.00	29.55	61.55	31.65	29.90
1830	63.06	32.15	30.91	63.66	30.14	33.52
1831	64.47	36.47	28.00	64.48	31.90	32.58
1832	62.50	39.90	22.60	62.37	35.09	27.28
1833	60.07	36.65	23.42	62.40	34.36	28.04
1834	61 76	41.69	20.07	64.05	40.64	23.41
1835	62.74	35.24	27.50	65.92	33.94	31.98
Mean difference.			25.48	.....		28.46
Difference between the two places 2.98						

Monthly register of the thermometer during seven years at Cheltenham.

Months.	1829.			1830.			1831.			1832.			1833.			1834.			1835.		
	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.
January..	52.0	17.0	35.0	42.5	10.0	32.5	50.0	25.0	25.0	49.5	31.5	18.0	48.5	27.0	21.5	57.5	35.0	22.5	55.5	20.0	35.5
February.	54.0	27.0	27.0	58.0	17.0	41.0	61.0	29.0	32.0	55.0	28.5	26.5	54.5	30.0	24.5	52.5	32.0	20.5	52.5	29.0	23.5
March....	58.0	28.5	29.5	69.0	36.5	32.5	60.5	32.5	28.0	56.0	31.0	25.0	54.5	29.0	25.5	56.0	30.0	26.0	59.5	30.5	29.0
April.....	59.5	32.0	27.5	74.5	26.0	48.5	62.5	34.5	28.0	69.5	38.5	31.0	64.0	35.0	29.0	61.0	33.0	28.0	69.0	29.0	40.0
May	73.5	41.0	56.38	75.0	40.0	35.0	69.5	33.0	36.5	70.0	38.5	31.5	79.0	41.0	38.0	69.0	43.5	25.5	67.5	41.0	26.5
June.....	76.0	42.5	33.5	70.0	43.0	27.0	72.5	48.0	24.5	73.5	48.5	25.0	76.0	46.0	30.0	77.0	45.0	32.0	81.5	41.0	40.5
July	79.5	49.0	30.5	81.5	49.0	32.5	77.5	50.0	27.5	76.5	49.0	27.5	74.0	46.0	28.0	78.5	51.0	27.5	81.0	50.0	31.0
August...	72.5	46.5	26.5	74.0	43.5	31.5	77.5	52.5	25.0	76.0	49.0	27.0	69.5	45.5	24.0	77.5	44.0	33.5	80.5	48.0	32.5
September	64.0	41.5	22.5	67.0	43.5	23.5	68.0	46.0	22.0	72.0	45.0	27.0	63.0	40.5	22.5	72.5	46.0	26.5	71.5	42.0	29.5
October...	62.0	32.5	29.5	71.0	38.5	32.5	68.0	43.0	25.0	65.0	40.0	25.0	62.5	39.5	23.0	69.0	33.5	35.5	61.0	35.5	25.5
November	56.0	34.5	21.5	61.0	33.0	28.0	58.0	32.5	25.5	59.0	29.5	29.5	60.5	33.5	27.0	60.5	31.0	29.5	55.5	31.5	24.0
December	49.5	22.0	27.5	52.0	15.0	37.0	58.5	35.0	23.5	56.5	34.0	22.5	57.5	33.0	24.5	55.5	31.5	24.0	53.0	16.0	37.0
Max. and min. of the years	79.5 July 25th.	17.0 Jan. 24th.	62.5 Grtst. range	81.5	10.0	71.5 Grtst. range	77.5 July 31st.	25.0 Jan. 8th.	52.5 Grtst. range	76.5 July 17th.	28.5 Feb. 20th.	48.0 Grtst. range	79.0 May 15th.	27.0 Jan. 22nd.	52.0 Grtst. range	78.5 July 18th.	30.0 Mar. 19th.	48.5 Grtst. range	81.5 June 10th.	16.0 Dec. 25th.	65.5 Grtst. range

Absolute range of thermometer.

	Highest.	Lowest.	Greatest range.
Cheltenham (7 years)	81.5°	10.0°	71.5°
London (30 years)...	96.0°	5.0°	91.0°

Mean range of the thermometer.

	Annual range.	Monthly range.
Cheltenham	59.7°	31.71°
London	64.08	34.0°

Monthly register of the barometer during seven years at Cheltenham.

Months.	1829.			1830.			1831.			1832.			1833.			1834.			1835.		
	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.	Max.	Min.	Rng.
January.	30.01	28.83	1.18	30.35	28.76	1.59	30.26	28.91	1.35	30.18	29.18	1.0	30.38	29.22	1.16	30.13	28.91	1.22	30.55	28.75	1.78
February	30.25	28.86	1.39	30.07	29.16	0.91	30.07	28.75	1.32	30.26	29.04	1,22	29.81	28.72	1.09	30.16	29.47	0.69	30.21	28.84	1.37
March ...	30.07	29.06	1.01	30.38	29.23	1.15	30.16	28.90	1.26	30.12	29.13	0.99	30.05	28.80	1.25	30.26	29.31	0.95	30.34	28.72	1.62
April.....	29.86	28.71	1.15	30.04	29.05	0.99	30.14	28.86	1.28	30.19	29.25	0.94	29.98	28.82	1.16	30.15	29.14	1.01	30.25	29.35	0.90
May	30.15	29.80	0.71	30.05	29.19	0.86	30.18	29.22	0.96	30.14	29.11	1.03	30.12	29.18	0.94	30.12	29.15	0.97	29.94	29.21	0.73
June.....	30.13	29.21	0.92	29.92	29.25	0.67	29.97	29.44	0.53	30.05	29.24	0.81	29.96	29.20	0.76	30.04	29.38	0.66	30.13	29.12	1.01
July	29.91	29.15	0.86	30.04	29.25	0.79	30.06	29.46	0.60	30.03	29.47	0.56	30.13	29.40	0.73	29.97	29.30	0.67	29.97	29.51	0.46
August...	29.97	29.14	0.83	30.00	29.10	0.90	29.96	29.44	0.52	29.96	29.02	0.94	30.06	28.85	1.21	29.97	29.35	0.62	30.07	29.28	0.79
September	30.00	29.05	0.95	30.00	29.00	1.00	29.94	29.14	0.80	30.19	29.41	0.78	30.06	29.15	0.81	30.46	29.42	1.04	29.93	28.86	1.07
October...	30.13	29.78	0.86	30.20	29.50	0.70	30.06	29.02	1.04	30.12	29.01	1.11	29.98	28.90	1.08	30.57	29.42	1.15	30.17	28.70	1.47
November	30.14	29.41	0.73	30.07	28.80	1.27	30.24	29.16	1.08	30.21	29.20	1.01	29.99	28.60	1.39	30.44	29.32	1.12	30.20	28.83	1.37
December	30.32	29.44	0.88	30.14	28.76	1.38	30.20	28.52	1.68	30.15	29.24	0.91	29.89	29.11	0.78	30.42	29.33	1.09	30.33	29.06	1.27

Absolute range of barometer.

	Highest.	Lowest.	Greatest range
Cheltenham (7 years)	30.57	28.52	2.05
London	30.62	28.22	2.40

Mean range of barometer.

	Annual range.	Monthly range.
Cheltenham (7 years)	1.50	1.01
London	1.95	1.07

Mean height of barometer for seven years.

1829.	1830.	1831.	1832.	1833.	1834.	1835.
29.51	29.57	29.39	29.61	29.61	29.74	29.62

Mean height at Cheltenham ..... 29.56 inches.
..... London ..... 29.82 ———

Winds.—The sheltered situation of Cheltenham, and its relation to the Cotswold Hills, necessarily influence, in some degree, the prevailing character of the winds. It appears that throughout England the westerly winds are most frequent, in proportion to easterly winds nearly as three to two. At Cheltenham, in some years, they have been in the proportion of nearly two to one: but the following table, prepared by Mr. Moss, will show that in ten years the proportion of westerly winds to easterly has been about eleven to seven.

Number of days on which various winds have prevailed during seven years.

Years.	East.	West.	North.	South.	N. E.	N. W.	S. E.	S. W.
1829	41½	35½	57½	38½	52½	28½	36	75
1830	30	50	42	44½	15½	18½	51	113½
1831	32¼	43½	36½	54½	27	21	48½	101½
1832	22½	45	33	54½	31½	32	57	90½
1833	28½	61½	33	43½	28½	28½	58	83½
1834	23	35	20½	53½	45½	22½	48½	116½
1835	19	48½	25½	60	33½	34	58½	86
Total in 7 years	196¾	319	248	349	234	185	357½	666½

It will be seen that the number of days on which south-westerly winds have prevailed during the seven years above given, is very nearly double that of any other winds, and the whole westerly and southerly winds for the above period are to the total northerly and easterly winds very nearly as three to two. It is, therefore, most probable that Cheltenham enjoys no peculiarity in this respect, but that the proportion of westerly winds is here much as in other parts of England.

Rain.—Cheltenham, like all other places in the immediate vicinity of hills, possesses rather a moist climate, which perhaps it in some measure owes to its being directly exposed to the action of the southerly winds, which, charged with aqueous vapour, come sweeping up the vale of Gloucester. As the summits of the Cotswold Hills are always colder than the valley by two degrees or more, the winds, saturated with moisture, deposit their contents, in the shape of rain, immediately on reaching the colder strata of air blowing over the tops of these hills.

Number of days on which rain has fallen, and southerly winds prevailed at Cheltenham, during seven years.

Years.	Days of rain.	Days of southerly winds.
1829	99	149½
1830	110	209
1831	109	204½
1832	102	202
1833	110	185
1834	113	218½
1835	122	204½
Annual mean ...	110	196

Monthly fall of rain at Cheltenham, during four years, in inches and parts of inches.

	1833.	1834.	1835.	1836.
January	0.58	5.11	1.625	2.49
February	5.66	1.105	3.35	2.885
March.....	2.015	0.95	3.30	4.49
April	3.115	0.96	1.70	2.59
May	0.72	1.09	4.315	0.57
June	3.885	2.325	3.20	2.14
July	3.175	9.60	1.025	3.07
August	1.565	3.61	1.225	2.15
September	3 77	3.255	3.47	2.755
October	2.94	0.435	6.03	3.45
November	2 255	1.94	3.325	4.785
December	3.775	1.12	0.88	2.47
Annual amount	33.455	31.50	33.445	33.845

On comparing the results of these tables we ascertain that the climate of Cheltenham is very nearly on a par with that of the neighbourhood of London, as regards mean temperature, but that it is superior to the latter in equability, having a smaller range of the thermometer, both annual and monthly.

In Cheltenham the summer is more than two degrees cooler than in London, while the winter is nearly three degrees warmer. This may seem a trifling difference, but I believe it to be not devoid of importance to many classes of invalids, especially to those suffering from diseases of the respiratory organs.

Rain falls in greater quantity, but much less frequently, at Cheltenham than at London, the average amount at the former place being thirty-three inches, at the latter only twenty-five inches; but in London rain falls one hundred and seventy-eight days in the year, in Cheltenham only one hundred and ten.

But let us turn to the details of the climate of the Landsend district, as given by Dr. Forbes, in his excellent Medical Topography of that place, published in the second volume of the *Transactions* of the Provincial Medical Association. "The Landsend district" says Dr. Forbes, "is characterised essentially by a remarkable degree of *equability* of temperature, or small extent of range above or below the mean. In this respect the district of the Landsend is superior to any other part of England, and, indeed, to any place in Europe of which we possess meteorological accounts. Madeira is the only climate which Dr. Clark considers as superior in regard to equability of temperature."

The difference between the annual mean temperature of Cheltenham and that of the Landsend is only 1.54°. The spring at Cheltenham is very nearly the same as at Penzance, the summer is about 0.6° warmer, and the winter is colder by 3.8°.

The difference of mean temperature of summer and winter is less at Penzance than at Cheltenham by 3.64°. But in the equability of its climate, Cheltenham necessarily falls far behind the Landsend district, though less so than most other inland localities of the southern counties of Great Britain. The difference between the mean annual range of the thermometer at both places amounts to 10.7°, which is less by more than four degrees than the difference between the mean range of Penzance and that of London.

With regard to humidity, it appears that the number of days on which rain falls at the Landsend is greater than at Cheltenham, and that a greater

amount of rain also falls annually. At the Lands-end the mean of eleven years gives one hundred and thirty-nine days of southerly winds per annum, which is a less proportion than in Cheltenham; but the proportion of northerly and easterly to southerly and westerly winds is the same in both places, viz., three to two.

PART II.—STATISTICAL AND MEDICAL.

Population.—By the public population returns of 1831, the amount of the population of Cheltenham was ascertained to be as follows:—

Inhabited houses.	By how many families occupied.	Houses now building.	Other houses uninhabited.	Families chiefly employed in agriculture.	Families employed in trade, manufactures, &c.	Families not comprised in the two preceding classes.	Males.	Females.	Total Persons.
4013	4766	90	246	135	1875	2756	10053	12889	22942

Number of males twenty years old.	Occupiers of land employing labourers.	Occupiers not employing labourers.	Labourers employed in agriculture.	Males employed in manufacture, &c.	Males employed in retail trade, handicraft, &c.	Wholesale merchants, bankers, professional persons, and other educated men.	Labourers employed by the three preceding classes, not in agriculture.	All other males 20 years old, retired tradesmen, superannuated labourers, &c.
5375	10	9	210	2	1935	667	1725	253

Male servants upwards of 20 years old 564
Male servants under 20 years old 139
Female servants 2334

The following table, derived from similar authentic sources, will show the rapid increase of population in Cheltenham during the thirty years preceding 1831:—

Date of census.	Number of inhabitants.			Number of houses.	Houses building
	Male.	Female.	Total.		
1801	1405	1671	3076	710	15
1811	3780	4545	8325	1566	127
1821	6083	7305	13388	2297	119
Increase of population in 30 years 19,969					

From the foregoing documents it appears that the rate of increase per cent. in the population of Cheltenham has been, for the whole period of thirty years, between the census of 1801 and that of 1831, as much as 86.5; and that the last decennial increase has been at the rate of 41.6 per cent.

The increase in the number of visitors is equally remarkable, having been, within the last twelve years, as much as fifty per cent.

Year.	No. of visitors.
1780	374
1790	1000
1802	2000
1808	4000
1824	6000
1836	12000

Supposing the rate of increase to continue the same as for the last ten years, the population of Cheltenham may be calculated at present to amount to rather more than 28000 persons. The number

of houses erected since the last census has been very great, and the rate of increase will probably be higher than the above stated. The proportion of males, upwards of 20 years of age, is about 23.4 per cent. of the whole population; and that of the males is 77.99 per cent. of the total number of females.

There is one remarkable circumstance to be observed in this census, and which perhaps is peculiar to Cheltenham,—that out of a population of 22,942 persons, two males only are returned as engaged in manufacture. It is also worthy of remark, that more than half the total number of families are not engaged in either agriculture, trade, or manufacture, but possess means of support independent of the town itself; from these, however, must be subtracted the lodging-house keepers, a rather numerous class in Cheltenham.

Employment &c. of the Inhabitants.—As Cheltenham possesses no manufactures, no staple commodity, or external trade, the great body of its inhabitants must necessarily be engaged in as many different varieties of employ as there are wants to be supplied, and necessaries to be provided for the use and consumption of the town itself. Of those classed in the census as families employed in agriculture, the majority are market-gardeners, by whom the vegetable market of the place is most abundantly supplied. House building gives employment to a great number of labourers, chiefly Irish, and the remainder are occupied in the various branches of labour to which it gives rise. The necessaries of life are abundant and reasonable in price, and the

general condition of the poor is more than ordinarily favourable. Fuel is not cheap owing to the land carriage from Gloucester.

Water.—Owing to the nature of the soil before alluded to, it happens that in those parts of the town which do not rest upon sand, but immediately on the clay, the wells dug for the supply of water for domestic use are, more or less, impregnated with saline matters, and unfit for economical purposes. Even those wells dug in the sand are apt to acquire a similar mineral impregnation. It has in consequence become necessary to procure a supply of pure water from the neighbouring limestone hills, and this has been accomplished by leading the waters of a spring, situated 477 feet above the level of the town, into a reservoir, from whence it has a fall of 240 feet. The water thus procured is of an extremely pure and good quality, and very abundant.

Manufactures.—In stating that there is no manufactory of any staple commodity in Cheltenham, I must make an exception in favour of the manufacture of Cheltenham salts, which, though not giving employment to many individuals, is well worthy a passing notice. These salts, which have found their way over the greater part of the globe, are procured by evaporating the mineral waters to crystallization. The water, flowing from more than eighty wells, is forced, by means of pumps, through leaden pipes into a main pipe, which conducts into several large reservoirs in the manufactory. From these it is pumped into wrought iron boilers, where it is evaporated by heat during several days. The

steam is carried off by pipes, and used for heating the baths connected with the establishment. During the process of boiling, a portion of carbonic acid gas is driven off, and the bicarbonates of magnesia and lime being thus reduced to the state of subcarbonate, are rendered insoluble and precipitated. When the fluid is allowed to escape from the boiler into a cooling vessel placed beneath it, these precipitates are retained on a strainer employed for the purpose. They are afterwards treated with sulphuric acid, and the sulphate of magnesia thus formed, removed in a state of solution, while the sulphate of lime is precipitated.

The filtered fluid is further evaporated at a heat below 212°, until a pellicle forms on its surface, denoting the commencement of crystallization. It is then removed into a wooden vessel, where it remains twenty-four hours, in order that any impurities it contains may subside. It is afterwards poured into iron pans, lined throughout with marble, in which it is allowed to crystallize, the process being assisted by pieces of wood laid to float upon its surface. When the salts are intended for exportation to tropical climates, the water of crystallization is driven off by heat, and the salt packed up in a state of effervescence.

Education and Religious Accommodation.—That the younger branches of the working population in Cheltenham are well provided with the means of acquiring a scriptural and useful education, will be seen by the following table of the number of children attending Infant, National, and Sunday Schools, of various religious denominations :—

ESTABLISHED CHURCH.

Infant Schools	650
National ditto	1350

DISSENTERS.

Moderate Calvinists	175
High Calvinists	300
Wesleyan Methodists	450
Highbury ditto	180
Baptists	210
Independents	150
Protestant Union Schools of various sects	500
Roman Catholics	50
Total	4015

Supposing the present population of Cheltenham to be about 28,000, and calculating the children living between the ages of five and fifteen to be about twenty per cent., it will be seen that the public schools, together with many private ones not taken into consideration, afford ample means of instruction to the junior portion of the lower orders.

In a town such as Cheltenham, so great a resort of multitudes, whom the pursuit of health or of pleasure brings together in that place, but little information can be gained, in a statistical point of view, from an examination of the numbers of deaths, births, and marriages, which have taken place. It is of course impossible to separate those indigenous to the town from those which are altogether accidental.

The following tables have, however, been prepared from the parish registers, with a view of furnishing as much information as possible on this subject.

Total marriages, births, and deaths, registered in the parish church at Cheltenham, during ten years.

Years.	Marriages.	Baptisms.			Deaths.		
		Male.	Fem.	Both.	Male.	Fem.	Both.
1825	212	304	336	640	190	172	362
1826	174	324	329	653	180	184	364
1827	178	295	312	607	164	139	303
1828	168	317	267	579	143	122	265
1829	164	278	286	564	136	152	288
1830	170	345	300	645	153	143	296
1831	189	320	346	666	155	178	333
1832	252	334	300	634	199	216	415
1833	287	360	384	744	208	216	424
1834	274	380	426	806	239	232	470

Number of illegitimate children baptized at the parish church during ten years.

Years.	Male	Fem.	Both.	Years.	Male	Fem.	Both.
1825	5	10	15	1830	9	17	26
1826	9	13	22	1831	12	16	28
1827	4	5	9	1832	16	16	32
1828	12	8	20	1833	18	16	34
1829	11	7	18	1834	15	9	24

Proportion of sexes born.

	Males.	Females.
England and Wales...	100	96
Cheltenham	90	100

Proportion of marriages and baptisms to population in Cheltenham.

	Marriages.	Baptisms.
1831	1 in 121	1 in 34
1834.....	1 in 91	1 in 31

Proportion of marriages to baptisms.

1831 ..... 1 in 1.7
1834 ..... 1 in 2.9

Table of burials in the parish church of Cheltenham during ten years, showing the number of deaths at different ages from birth upwards.

Age.	1825.			1826.			1827.			1828.			1829.			1830.			1831.			1832.			1833.			1834.		
	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot	Ma.	Fm.	Tot
Under one year	61	58	119	61	48	109	52	30	82	43	21	64	32	28	60	50	34	84	53	38	91	41	35	76	51	38	89	70	71	141
1 to 2	15	23	38	22	18	40	16	18	34	10	10	20	6	15	21	11	12	23	19	10	29	18	24	42	22	16	38	21	29	50
2 to 5	15	16	31	17	15	32	12	12	24	10	14	24	17	16	33	15	9	24	12	19	31	38	34	72	29	27	56	21	22	43
5 to 10	12	9	21	6	9	15	6	4	10	6	5	11	11	3	14	3	4	7	7	10	17	9	16	25	8	16	24	21	11	32
10 to 20	11	7	18	5	11	16	7	7	14	7	11	18	10	10	20	4	6	10	5	12	17	12	11	23	10	10	20	9	6	15
20 to 30	14	14	28	8	18	26	11	14	25	13	12	25	14	16	30	7	12	19	9	18	27	18	20	38	16	19	35	6	20	26
30 to 40	14	10	24	19	14	33	18	10	28	13	12	25	8	13	21	9	17	26	12	10	22	8	25	33	16	17	33	19	14	33
40 to 50	16	11	27	13	19	32	9	15	24	11	8	19	11	13	24	11	15	26	10	14	24	21	14	35	12	17	29	14	17	31
50 to 60	13	8	21	6	8	14	12	9	21	9	4	13	8	7	15	14	14	28	7	17	24	13	12	25	21	14	35	22	13	35
60 to 70	10	6	16	10	10	20	12	13	25	11	10	21	6	17	23	17	11	28	6	8	14	11	12	23	12	15	27	22	14	36
70 to 80	6	7	13	8	6	14	4	4	8	8	12	20	9	10	19	6	6	12	8	16	24	7	8	15	7	19	26	7	10	17
80 to 90	2	2	4	5	7	12	4	3	7	2	3	5	4	4	8	6	3	9	6	6	12	3	5	8	4	8	12	4	4	8
90 to 100.....	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	1	3
100 and upwards	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total.....	190	172	362	180	184	364	164	139	303	143	122	265	136	152	288	153	143	296	155	178	333	199	216	415	208	216	124	238	232	470

Total burials in ten years 3520

Table of the number of burials each month at the parish church of Cheltenham for ten years.

	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
January	42	48	21	21	35	27	18	31	62	26
February	22	53	24	23	33	20	25	27	42	33
March	31	35	25	31	27	25	28	34	29	32
April.....	26	31	37	31	20	24	31	40	43	58
May	27	25	25	24	32	26	25	41	42	48
June	16	20	17	17	24	21	22	31	33	34
July	17	18	32	18	21	22	28	29	17	23
August	41	29	28	23	14	20	31	19	28	54
September ...	40	36	22	23	24	29	25	32	22	46
October	37	25	21	19	24	35	28	33	38	31
November ...	33	26	23	17	22	20	33	43	30	33
December.....	30	18	28	18	22	27	39	55	38	52

Proportion of deaths to population in Cheltenham.

1821.	1831.	1834.
1 in 56	1 in 69	1 in 54

Actual deaths at all ages in Cheltenham during ten years.

Dths. from Birth to 10 years.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to
1796	171	279	278	271	231	233	158	95	6	2
Total deaths 3520										

Relative proportion of deaths at Cheltenham and at Carlisle at all ages, the total being supposed to be 10,000 *in each place.*

	Deaths from Birth to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100to
Cheltenham	5102	485	792	789	769	656	661	434	269	17	5
Carlisle ...	3569	384	462	576	671	817	1244	1440	732	98	7

Law of mortality in Cheltenham, supposing the total births to be 10,000.

Number of persons that will be alive at each year.									
At 10 years	At 20.	At 30.	At 40.	At 50.	At 60.	At 70.	At 80.	At 90.	At 100
4898	4413	3621	2832	2063	1407	746	312	43	26

By the preceding tables the amount of mortality in infant life, or from birth to ten years of age, is very great, more than one half the children born dying before they arrive at their tenth year. The number of persons who reach to the age of one hundred and upwards has always been great at Cheltenham, as testified by the local records; and the same result is given by the above tables, twenty-six persons remaining alive at one hundred years of age out of 10,000 births, or 0.26 per cent. In fact these tables give a very much greater proportion of deaths in the earlier periods of life, that is from birth up to fifty years of age, than could reasonably be calculated on, a circumstance to be attributed to the causes before-mentioned, that great numbers of the invalids who arrive here serve to swell the lists of mortality beyond their due proportion. For these reasons I do not place much reliance on the results thus obtained, as affording correct grounds for statistical calculations.

Medical History, Diseases, &c.—The general salubrity of the town of Cheltenham, its sheltered

position and equable climate, the absence of large manufactures, and of those arts and employments which, while they administer to the general comfort, and are productive of general advantage, exert an injurious influence on individual health, the comparative ease in which the poorer classes of the population live, and the great amount of public and private charity exercised in this town, are among the causes to which the general freedom from any great amount of endemic or epidemic disease is to be attributed. In consequence of the late era at which nearly the whole of the town has been built, the streets inhabited by the lower classes are, for the most part, at least in the lower parts of the town, wide and open thoroughfares, generally running in a straight line north and south, the houses built of brick, tiled, and well ventilated, having usually a small garden in the rear of each tenement, so that a constant current of air may pass through a house having doors and windows on two opposite faces.

It will be observed, on referring to the census of 1831, that the number of families resident in Cheltenham then exceeded the number of inhabited houses by seven hundred and fifty-three, which is about one and nine-fiftieths families to each house. The greater part of this excess is accounted for by the existence of a numerous class of persons occupying a better description of houses, who in Cheltenham gain a livelihood by letting lodgings. The proportion of small houses in the worst streets containing many families is comparatively small, though much greater now than at the period when the

census was taken. In a few cases only I have observed houses appropriated to lodgings for travellers, making up twenty or thirty sleeping places a night closely packed together in small rooms. In this respect Cheltenham differs very much from most other towns having an equal amount of population, as the want of any extensive commercial relations prevents that accumulation of indigent and dissolute operatives which takes place in large trading communities.

Cheltenham has had the benefit of a good system of drainage and common sewers only within the last four years. Previously to 1833 the houses were furnished with cess-pools, which proved a constant nuisance, and must have been extremely insalubrious. When these reservoirs were dug in sand, the fluid matter, percolating through the sand, though in its passage it frequently tainted the springs and wells in the neighbourhood, yet gradually filtered through and passed away ; but in those parts of the town which rest on the clay, the nuisance was much greater, a constant focus of noxious exhalation being thus maintained in the vicinity of each house. The town is now exceedingly well drained by means of a large tunnel, which, passing down the centre of the High Street, empties into the Chelt below the town : other sewers open into the Chelt at various parts of its course, and render the neighbourhood of this brook, when uncovered, extremely unpleasant and unhealthy. Measures are now in progress for covering over the Chelt within the precincts of the town, and thus

removing the last blot upon the arrangements of the local authorities.

Another improvement which has lately been effected, is the appropriation of three acres of ground in an open part of the town for the purposes of a public cemetery. The old church-yard belonging to St. Mary's, the only parish church, is placed in the very centre of the population, and surrounded on all sides by streets and buildings. It had become very inconveniently crowded, and whatever may be said in favour of the salubrity of exhalations from decomposing animal matter, there can be no doubt but that the neighbourhood will benefit by the change.

Medical Institutions.—The principal medical institution is the Cheltenham Dispensary and Casualty Hospital, originally established in 1813. It was at first purely a Dispensary, affording medical relief to out-patients only; but in 1822 a casualty ward was added for the reception of accidents and of cases requiring surgical operation. This department has gradually increased with the increasing population, until at length within the past year arrangements have been made for erecting a building which shall contain seventy beds.

The officers of the institution, four physicians and six surgeons, perform their duties gratuitously, and a house-surgeon and apothecary alone receives a salary.

The following table will show the amount of medical assistance afforded to the poor by this institution during a period of ten years :—

Table showing the number of patients admitted, cured, relieved, or otherwise discharged, and died, at the Cheltenham Dispensary and Casualty Hospital, during ten years.

	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	Grand Total.
Out-patients	2864	3103	3288	3423	3621	4353	4269	4015	3952	4109	36937
In-patients..	31	42	50	57	56	41	58	74	81	66	556
Total.....	2895	3145	3278	3480	3677	4394	4327	4089	4033	4175	37493
Cured	2448	2841	2868	3027	3128	3685	3559	3202	3246	3281	31285
Dis. relieved	63	77	68	44	55	86	37	56	42	65	593
Dis.for irreg.	1	...	...	...	...	15	21	25	29	48	139
Died	32	42	58	49	57	71	69	66	59	83	586
Rem. on bks.	351	185	259	307	381	356	486	568	487	502	3892
Midwif. cas.	...	...	...	...	...	132	117	129	137	157	672

By this table, the details of which have been extracted from the records of the institution, 83.3 per cent. of the total number admitted have been cured; while the deaths have been only one in sixty-three, or 1.6 per cent. This is a very small proportion of deaths, and may be looked upon as a confirmation of the opinion entertained of the general salubrity of the place. The rate of increase per cent. of admissions, during the ten years, has been 30.6, which accords with the decennial increase of population of 41.6 per cent. The annual expenditure of the institution during the same period, including drugs, house rent, house apothecary's salary, and all other expenses, has been as follows:—

Years.	Expenditure. L.	S.	D.	Years.	Expenditure. L.	S.	D.
1826	813	10	10	1831	839	1	5
1827	841	6	3	1832	927	11	6
1828	855	9	1	1833	893	14	10
1829	808	18	10	1834	948	15	9
1830	854	5	4	1835	981	17	8
Total ..... £8764 11*s.* 7*d.*							

This makes the expense for each individual admitted about four shillings and eightpence, but the cost of drugs, wine, leeches, &c., during the above period, having been three thousand two hundred and eighty-three pounds, sixteen shillings and tenpence, the actual expenditure of medicine on each patient has been only one shilling and ninepence, though this department has always been conducted in the most liberal and unsparing manner. The cost of wine given to out and in-patients has amounted to one hundred and forty pounds.

In attempting to form some idea of the frequency of hernia in this town and neighbourhood, (for the individuals applying to the Dispensary for relief are often residents in parishes some miles distant,) I have been unable to do more than collect the number of trusses supplied at the above institution during a period of eight years.

	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	Total in 8 years.
Number of trusses supplied.....	32	53	58	49	38	49	33	39	341

This gives one case of hernia in 109.9 of the total number of patients admitted, or 0.9 per cent.

Another Dispensary for the diseases of women and children has lately been established, which has given relief to about 1200 cases annually; a Midwifery Institution also exists; and until the last few months an Eye Dispensary was in being.

Diseases.—Owing probably to the open and airy character of the streets, and the favourable circum-

stances in which the inhabitants of Cheltenham are placed as to diet, employment, dwellings, &c., epidemics and contagious disorders, malignant fevers, small-pox, &c., may be considered as of rare occurrence, and never commit those frightful ravages not uncommon in more ancient and more densely populated cities. During the prevalence of the cholera in England, in 1832, this epidemic was very fatal at Gloucester, Tewkesbury, and other places in the neighbourhood; but only one, and that a doubtful case, occurred in Cheltenham. This exemption from the almost universal scourge was attributable to the wise sanatory precautions adopted by the Board of Health and magistracy of the town, who were more than ordinarily strict in enforcing cleanliness and other hygienic precautions among the poorer classes. Cheltenham was also fortunate in possessing a most indefatigable public officer, the house surgeon to the General Dispensary, to whose exertions may in a great measure be attributed the absence of the epidemic.

The meteorological register for the years 1831, 1832, affords no indication of any thing unusual; the number of days on which rain fell is rather less than ordinary. The number of patients admitted into the Dispensary in those years, is greater than in the three succeeding years, arising, not from the presence of spasmodic cholera, but from numerous cases of common diarrhœa

Fever.—The typhoid type of fever formerly prevailed, at intervals, much more extensively than at present; it has of late become infrequent, in consequence of the constant local improvements which

the town has received. I am informed by those gentlemen who have had the medical charge of the parish and union of Cheltenham during the last ten years, that they have never seen a case of ague, originating in the town of Cheltenham; but that the disease is very prevalent in all the villages of the surrounding country. This agrees with my own observations, and is not surprising when we consider the few foci of malaria which can exist in this place. On the contrary, the flat clay soil of the vale of Gloucester, which retains on its surface so large a quantity of water, and from which a constant evaporation is taking place, must necessarily be a fertile source of malarious influence, and accordingly we find that numerous cases of intermittent fever, chronic affections of the liver and spleen, rheumatism and its concomitant cardiac affections, are very frequently borne on the books of the Cheltenham Dispensary, the sufferers being generally from the villages of Badgworth, Boddington, &c., in the vale of Gloucester.

Pulmonic disorders are comparatively rare in Cheltenham as indigenous to the place, but a considerable number of cases of phthisis are imported into the town. The climate may be considered somewhat favorable to the retardation of the disease, but we do not find that such patients are *cured* here more frequently than in other localities. Bronchitis is not an unfrequent complaint, but severe cases of pneumonia and pleuritis are not often met with.

Scrofula of course exists, but is by no means of general occurrence among the poorest classes; and cases of bronchocele come in from the country, chiefly from the hill villages.

Calculous complaints are very rare; the operation of lithotomy has been performed only twice at the Casualty Hospital during the last fifteen years.

The following list has been taken from the Dispensary records; it comprises only the small number of patients, out of the total annual admissions, whose diseases could be ascertained with certainty. I may be allowed in this place to express my humble opinion that it is much to be lamented that one uniform system of registration of disease and mortality, together with a short personal and historical description of each patient admitted, should not be *enforced*, if possible, in every public charity in the United Kingdom. We should then have some solid foundation for statistical observations, instead of the *disjecta membra* of imperfect calculations which almost all treatises on Medical Statistics in this country must at present necessarily exhibit.

	1822.	1823.	1833.	1834.
Diseases of the nervous system	20	17	19	5
Diseases of the organs of digestion.....	56	96	115	119
Diseases of the organs of circulation ...	4	5	21	25
Diseases of the organs of respiration...	67	64	66	65
Diseases of the genito-urinary organs...	22	28	10	11
Febrile disorders.....	37	31	93	91
Arthritic diseases	27	38	31	25
Cutaneous diseases.....	9	12	30	19
Dropsical diseases	8	7	3	3
Miscellaneous	5	6	3	7
	250	303	401	374

Influenza.—The catarrhal epidemic of the winter of 1836-37, though as universal in Cheltenham as in other parts of the kingdom, yet appeared here in a much less severe form than in most places. It

presented the same general characters of febrile excitement, dyspnœa, cough, and coryza, but proved fatal in only one or two instances. I am acquainted with many individuals who are now suffering from symptoms of chronic bronchitis, the sequelæ of the catarrhal affection, and have been, since last winter, peculiarly susceptible of the influence of atmospheric changes.

The following meteorological register of the period during which the influenza prevailed in Cheltenham, supplied by Mr. Moss, is subjoined for comparison with similar registers in other years and in other localities :—

December, 1836.				January, 1837.				February, 1837.			
Thermometer.				Thermometer.				Thermometer.			
Max.	Min.	Mean.	Range	Max.	Min.	Mean.	Range	Max.	Min.	Mean.	Range
54.5	21.0	40.02	33.5	53.0	25.0	37.5	28.0	54.5	28.0	41.87	26.5
Barometer.				Barometer.				Barometer.			
30.19	28.76	29.58	1.53	30.27	29.05	29.69	1.22	30.10	28.82	29.68	1.28

	WINDS.								RAIN.
	E.	W.	N.	S.	N. E.	N.W.	S. E.	S. W.	Inches.
December, 1836	0	$5\frac{1}{2}$	$1\frac{1}{2}$	1	$7\frac{1}{2}$	$1\frac{1}{2}$	1	13	2.47
January, 1837	$3\frac{1}{2}$	3	$6\frac{1}{2}$	$3\frac{1}{2}$	4	$3\frac{1}{2}$	2	5	2.83
February, 1837	0	2	0	5	$0\frac{1}{2}$	$4\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	3.59

A comparison of these tables with others contained in the meteorological portion of this paper, affords nothing which could lead us to expect any remarkable effects from atmospheric influence, as regards its more sensible qualities of heat, pressure, humidity,

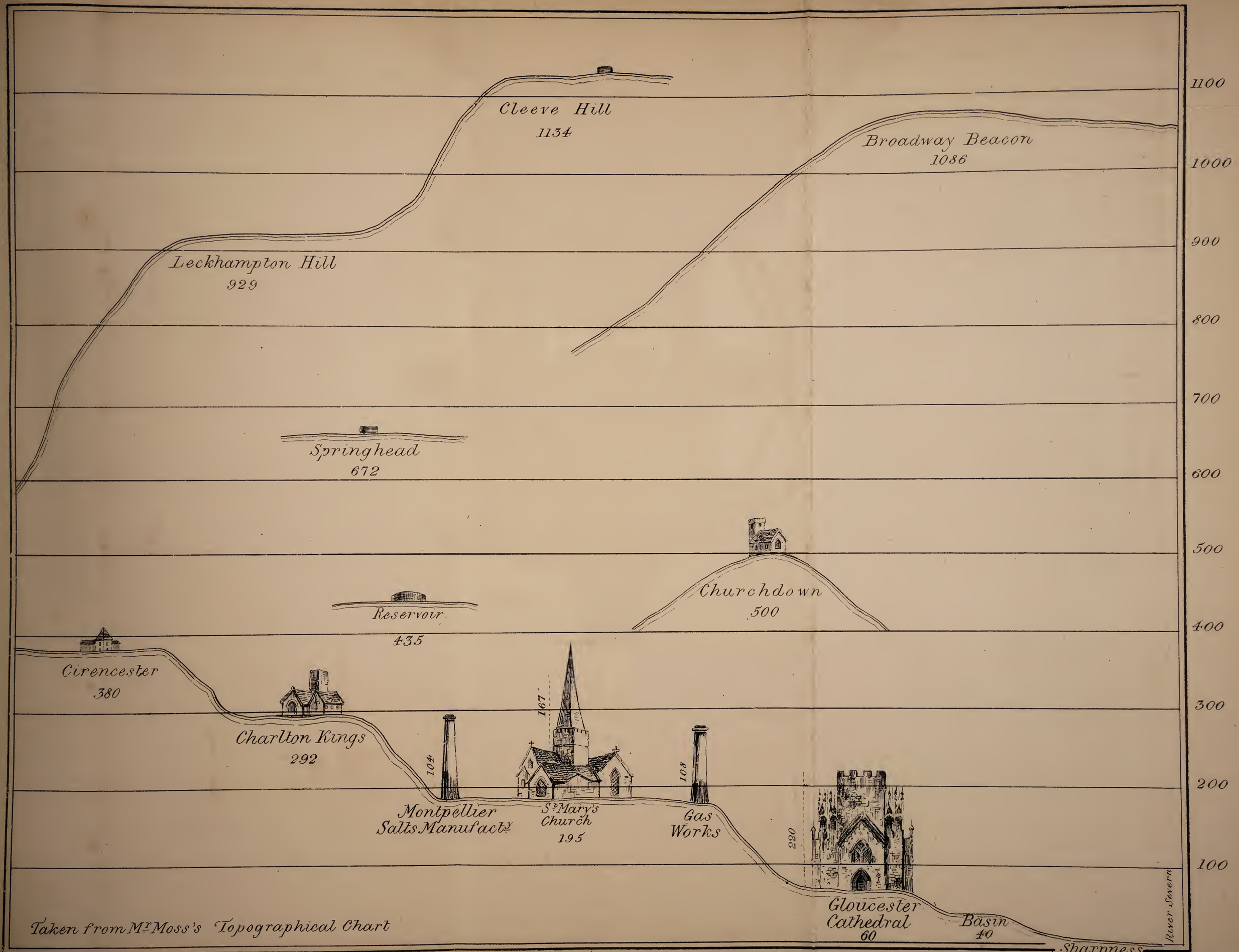
&c.; but it is worthy of remark that during the whole of the above period, the magnet electrometer of Lieut. Morrison indicated an almost constant presence of negative electricity in the atmosphere. Lieut. Morrison informs me that a numerous series of observations made by him with the same instrument at Liverpool, in the spring of 1834, when much epidemic disease prevailed, presented similar results, the magnetic needle being deflected 13° from the north during twenty-four consecutive days, with very few exceptions. The result of his observations during that period is as follows:—

Number of observations	70	— Electricity plus	687°	— Mean deflection	9.8°
Ditto	173	— Ditto minus ...	2716°	—	15.7°
Ditto	17	— Ditto nil	0°		
	260	Total	3403°		

There were, therefore, only seventeen cases out of two hundred and sixty in which the atmospheric electricity was not disturbed. I mention these facts only because it appears important that future observations should be made on the recurrence of epidemic disorders, in connection with particular electrical conditions of the atmosphere, in order that we may be enabled to judge whether such connection is likely to yield us that clue to the mysteries of epidemic influence, which our present system of meteorological observation is evidently inadequate to afford.

The general medical history of Cheltenham is contained in the history of its mineral waters. These waters are all cold, as might be premised from their

geological position, and the absence of all traces of volcanic action in their neighbourhood. It is not necessary here to enter into a description of their properties as medical agents, or of the diseases in which they are beneficially employed. Such a course might add to the volume, but would scarcely increase the value of this imperfect outline of the Medical Topography of Cheltenham.



Taken from Mr Moss's Topographical Chart

Fairland, lithog

PART III.

ESSAYS AND CASES.

ARTICLE V.

A CURSORY

ANALYSIS OF THE WORKS OF GALEN,

SO FAR AS THEY RELATE TO

ANATOMY AND PHYSIOLOGY.

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A KNOWLEDGE of the early state of any branch of science cannot be uninteresting to a philosophical mind, even though not conversant with that particular branch of science which may happen to fall under its consideration; but when such knowledge is capable of throwing light on the history of the profession to which an individual has attached himself, it may be considered as in some measure necessary to the liberal exercise of that profession.

In the hope that the early history of the medical profession may be to a certain extent elucidated by the following communication, I now offer a short and cursory analysis of the works of Galen, so far as they relate to Anatomy and Physiology.

* The references at the bottom of the page are applicable to Kühn's edition of Galen, xx vol., 8vo. Lipsiæ, 1821-1833.

To those who are acquainted with Dr. Lauth's treatise on the history of anatomy, published about twenty years since at Strasburg, the present attempt may at first sight appear superfluous; inasmuch as that treatise contains an account of Galen's writings on the subject of anatomy: but, independently of the consideration that Dr. Lauth's work does not appear to be much known in this country, and from its bulk would probably not find many purchasers, the plan of the following analysis differs sufficiently from that of the treatise in question, to obviate such an objection.

Every one knows that it is a disputed point whether Galen's anatomical descriptions, particularly of the muscles and of the viscera, apply generally to the ape or to man: but this is a question into the examination of which I shall not enter; considering it as one of those questions which may fairly be classed among the *difficiles nugæ* of science.

I would, however, observe with respect to those individuals who are disposed to advocate too exclusively the literary and philosophical claims whether of the "ancients" or of the "moderns," that they often take a very confined and partial view of the grounds on which those claims respectively rest. For, on the one hand, a very absurd homage is paid to antiquity by those who place the pretensions of the ancients, on occasions like the present, upon an equality with those of the moderns; since the question does not so much regard the original powers of the mind, as the amount of the accumulated knowledge on which those powers are to be exercised: and it would indeed be extraordinary, if, contrary

to the analogy observable with respect to individuals, the world should not know more in its old age, represented by the moderns, than it did in its infancy, represented by the ancients. On the other hand, it may fairly be asked of those persons who are in the habit of entirely disregarding the claims of the ancients, whether they have ever carefully examined the physical writings of Hippocrates, or Aristotle, &c.; or, lastly, of that remarkable man, with whom we are at present more particularly concerned, and who may justly be esteemed not only one of the most learned, but also one of the most acute writers on the subjects of anatomy and physiology. It may be suspected, indeed, that while the exclusive admirers of the ancients are often blinded by an unreasonable partiality to early impressions and opinions, the exclusive admirers of the moderns are as often blinded by an ignorance of the amount of knowledge possessed by the ancients.

In conducting the following analysis, I propose, after a few introductory remarks, to examine, first, Galen's account of the organs and processes of nutrition, secretion, and reproduction; then, of the instruments of voluntary motion; and, lastly, his account of the nervous system. And it will be convenient here to mention, with the view of preventing any supposition of an intention to misrepresent the true state of anatomical knowledge in the time of Galen, that most of the descriptive terms both in physiology and pathology, as well as in anatomy, which are now in use, were employed by him in the same sense as they are employed by modern authors. This observation, indeed, might be extended much

further; even to the diet, and some of the most common remedies of the most common walks of life. And it cannot but be evident to those who will take the trouble of making the search, that, down to the seventeenth century, both the Arabian physicians and those of Europe, the latter, indeed, generally through the medium of the former, borrowed largely from Galen, not only with reference to his ideas, but also his descriptive terms,—repeating his changes, for instance, on the four *humours*, "blood," "phlegm," "*yellow* bile," and "*black* bile;" and on the four *qualities*, "hot," "cold," "moist," and "dry."

Of Galen's familiarity with practical anatomy, and it is not of any moment in a general point of view whether this were human or comparative, there can be no doubt; since numerous passages of his writings attest the fact. In the examination, for instance, of the blood-vessels of the liver, he directs you to insert a probe into the "vena portæ," and from thence into any of its several larger ramifications; then, gently advancing the probe further and further, to dissect down to it. And thus, he says, you may trace the minutest branches; removing with the knife the intermediate substance, called by Erasistratus the "parenchyma."[a] Again, he notices, what every one has often practised in dissection, the occasional convenience of dividing the cellular membrane either by the finger or the handle of the scalpel:[b] and in describing the use of the blowpipe, and various other instruments and contrivances employed in anatomical examinations, he continually introduces you, as it were, into the dissection-room itself.[c]

a vol. ii., p. 575. *b* vol. ii., p. 476. *c* vol. ii., pp. 476, 668, 716.

The following statement is particularly worthy of notice, as indicative of Galen's anatomical dexterity. Having on some occasion laid bare an artery, and having made a longitudinal incision into it, he describes the introduction of a quill or small tube into the artery thus divided, and the consequent prevention of any undue effusion of blood, by a ligature passed round the extremities of the inserted tube.[d] Some instances, indeed, of the boldness and extent of his experimental anatomy are very remarkable; as when, in observing that although a ligature on the inguinal or axillary artery causes the pulse to cease in the leg or in the arm, yet the experiment is not seriously injurious to the animal on which it is made, he adds, that even the carotids may be tied with impunity.[e] And the habitual accuracy of his observation is evinced when he corrects the error of those experimentalists, who, omitting to separate the contiguous nerves in making a ligature on the carotids, supposed that the consequent loss of voice depends on the compression of those arteries, and not on the compression of the accompanying nerves.[f]

General Physiology.—Galen supposes that there are three modes of existence in the bodily system of man—the *nutritive*, common to animals and plants, of which the liver is the source; the *vital*, of which the heart is the source; and the *rational*, of which the brain is the source. He supposes, moreover, that the animal economy possesses *four* natural powers, which he calls respectively the *attractive*, the *alterative* or *assimilative*, the *retentive* or *diges-*

d vol. iv., p. 733. *e* vol. v., pp. 149, 150. *f* vol. v., pp. 266–7.

tive, and the *expulsive*;[g] and that every organ of the body has the power of attracting what is useful to itself, and rejecting what is useless.[h] In this hypothesis, which he often repeats in various forms, we are reminded of Bichât's doctrine of organic sensibility; particularly when Galen applies it in explanation of the final cause of hunger; with respect to which sensation, he observes, that the veins being naturally supplied with blood from the liver, the liver from the "*vena portæ*," and the *vena portæ* from the stomach, these organs have consequently no need of any stimulus to induce them to seek such a supply: but the stomach, having no supply within its natural reach, requires notice that such a supply is wanting; and hunger gives that notice. He adds that the sensation of hunger itself is produced by a pair of nerves of considerable size, the ramifications of which are distributed upon every part of the stomach.[i] These ramifications are evidently branches of the pneumo-gastric nerves of modern anatomy.

In accordance with the opinions which had prevailed in the medical schools for many centuries before his time, Galen asserts that there are *four* primary humours in the body; namely, blood, *yellow* bile, *black* bile, and an aqueous serum;[k] that it is the office of the liver to complete the process of sanguification, which commences in the stomach, and that during this process the *yellow* bile is attracted by the *pori biliarii* and gall-bladder;[l] the *black* bile by the spleen; and the aqueous serum by the two kidneys; the liver itself retaining the pure blood.[m] The

g vol. viii., p. 367. *h* vol. ii., p. 197. *i*. vol. iii., pp. 275–7.
k vol. i., p. 299. *l* vol. ii., pp. 177, 543. *m* vol. ii., pp. 177-8.

heart afterwards attracts this pure blood from the liver, through the *vena cava*, the ramifications of which distribute it to the various parts of the body.[n]

The simplest constituent parts of the body, as stated by Galen, are the hair, the nails, arteries, veins, nerves, cartilage, bone, ligament, membrane, glands, fat, and muscle;[o] all of which are formed immediately from the blood:[p] and these parts are described as being respectively of one and the same character throughout their whole substance. The organic members of the body, as the lungs, the liver, &c., are composed of several of the foregoing simple parts.[q]

The most important organs of the body are the "brain," with the nerves and spinal marrow; the "heart," with the arteries; the "liver," with the veins; and the "seminal vessels," &c.[r]

Organs and Process of Nutrition.—Galen observes that the proper nutriment of an animal is that which can be converted into, or assimilated to, the substance of its own body: and, in order to be assimilated, it must be acted on by certain organs, which are called "peptic," because they, as it were, concoct the food. A term, indeed, signifying conversion was applied by the Greeks to our food; because the substance of our food, whatever may have been its original nature, is ultimately converted into those various substances of which the body is composed.[s]

The organs of nutrition are, principally, the stomach, the intestines, the liver, and the veins.[t] The effect of the action of the stomach is an incipient

n vol. ii., p. 189. *o* pp. 319, 466. *p* vol. xv., pp. 252-3.
q vol. i., p. 466. *r* vol. i., p. 319, and vol. iv., p. 241.
s vol. i., p.p. 474, 644, &c. *t* vol. iii., p. 388.

purification of the matter of the food, the greater portion of the nutritious parts of which it for a time retains, sending the residuum towards the intestines.[u] The nutritive portion of the food thus retained by the stomach, and in part propelled to the intestines, is called by Galen indiscriminately "chyle,"[v] or "chyme," which, being absorbed by the veins of the stomach and intestines, is conveyed by them for more complete purification to the liver, which Galen considers as the great organ of sanguification.[w] The veins, which convey the chyle from the stomach and intestines to the liver, ultimately form one large vessel, which is called the "*vena portæ*," in consequence of its entering a depression on the concave surface of the liver, which depression was known by the name of the "*porta*" even before the age of Hippocrates. Of the formation of the *vena portæ* by the union of its several branches, Galen gives a very good description.[x]

While the chyle is flowing through the hepatic branches of the *vena portæ*, it is there perfected and assumes the character of blood, which is taken up by the minute branches of the proper veins of the liver, and is conveyed into branches, successively larger and larger, till it reaches the upper region of that organ.[y] Galen supposes that the communication between the ramifications of the *vena portæ* and of the proper veins of the liver, takes place by means of anastomosing pores or channels; and, considering the smallness of these channels, it is no wonder, he observes, that obstructions occasionally take place in the liver.[z]

u vol. iii., p. 266. *v* vol. i., p. 474. *w* vol. ii., p. 60, and vol. iii., p. 305. *x* vol. iii., pp. 266–9, and 337. *y* vol. xviii., pt. 2, p. 113. *z* vol. i., p. 285.

The branches of the proper veins of the liver, which have received the blood from the extreme ramifications of the *vena porta*, ultimately terminate in a very large vein, which, issuing from the upper part of the liver, is immediately separated into two main trunks. Of these trunks, one rises towards the neck and head and upper extremities; the other descends towards the inferior extremities; and each is subdivided into numerous branches, for the purpose of conveying the blood to every part of the body; the several parts or organs respectively attracting their proper nutriment from the blood thus conveyed to them.[a] From the preceding statement it appears that Galen considered the *venæ cavæ hepaticæ* of modern anatomy as the commencement or root of the venous system of the body at large.

In describing the passage from the fauces to the stomach, Galen uses indiscriminately the terms "*esophagus*" and "*stomachus*;" of which the former, he says, is most ancient, the term "*stomachus*" not having come into general use as synonymous with "*esophagus*" till after the time of Aristotle.[b] But the term "*stomachus*" was also applied by the ancients to the upper orifice of the stomach as well as to the *esophagus;* and it may be added, as a curious circumstance, that it was rarely, if ever, applied to the stomach itself.

In describing the muscular character of the stomach, and the use of its muscular mechanism, Galen asserts, as the result of frequent observation from the dissection of living animals, that the pylorus

a vol. iii., p. 272, and vol. x., p. 546. *b* vol. iv., p. 378, and vol. viii., p. 332.

acts as a valve *only* during the process of digestion, being relaxed when digestion is completed: arguing, in support of the probable truth of his observation, that, if it at all times mechanically acted as a valve, pieces of money of considerable size, and rings, &c., could not pass from the stomach to the intestines, as is repeately found to be the case.[c]

Of the symptom commonly called "heart-burn," Galen evidently knew the true character; for he describes it as an acrid sensation at the upper orifice of the stomach.[d] He says indeed expressly, in one part of his works, that no one who is acquainted with the writings of the ancients supposes that the term "*cardialgia*" signifies pain of the *heart;* for the ancients applied the term "*cardia*" to the mouth of the stomach as well as to the heart: and, in proof of this, he quotes Thucydides in his description of the symptoms of the plague of Athens.[e] And in another place he says, that, though both "*cardia*" and "*stomachus*" are applied to the entrance of the stomach, yet, of the two terms, the former is the most ancient.[f]

Galen seems to have been quite aware how much the character of ulcers in various parts of the body is affected by the state of the digestion; for he observes that, if the food be unwholesome, the resulting chyle will not be good; and that from unhealthy chylification, phagedenic and other ulcers will arise.[g]

In observing that the digestion of the food is

c vol. ii., pp. 152-7. *d* vol. iii., p. 356. *e* vol. v., pp. 274–5. *f* vol. xi., p. 242, and vol. viii., p. 338. *g* vol. i., pp. 644–645, and vol. x., p. 1008.

completed in the intestines, and that the nutriment, being absorbed by the mouths of very numerous veins which open on the inner surface of those organs, is thence conveyed to the liver, he adds that the convolutions of the intestines are numerous, in order that there may be a more extensive surface for absorption.[h] But although, as is apparent from the preceding and many other passages, he was ignorant of the true absorbent system, yet it is evident that he had observed the "lacteals:" for he says that, in addition to those mesenteric veins which by their accumulation form the *vena portæ*, there are visible in every part of the mesentery other veins, proceeding also from the intestines, which terminate in glands: and he supposes that these veins are intended for the nourishment of the intestines themselves.[i] Considering the general acuteness of his mind, and the accuracy of his observation, it is remarkable that Galen should ridicule some of his contemporaries for asserting that, upon exposing the mesentery of a sucking animal, several small vessels may be seen, filled *first* with air, but *afterwards* with milk.[k] He says indeed himself, on another occasion, that, in laying open the abdominal integuments and the peritoneum in young quadrupeds, you will see the arteries of the mesentery filled with milk; but adds, that neither in the mesenteric arteries, nor in any other arteries, will you see air alone contained.[l] It would here seem that Galen's contemporaries had mistaken colourless lymph for air; and that Galen himself had either not observed

h vol. iii., pp. 324-8. *i* vol. ii., p. 568, and vol. iii., p. 337.
k vol. ii., p. 649. *l* vol. iv., p. 718.

that the lacteals at some periods convey a transparent fluid, or had not examined their contents at such periods.

The Blood.—Galen states that there are four predominating fluids in the body, "blood," "*yellow* bile," "*black* bile," and an "*aqueous* serum;" and that the blood contains in itself the other three humours.[m] He considers the aqueous serum as the vehicle of the nutriment of the several parts and organs of the body, and that its superabundant aqueous particles are separated by the kidnies.[n] The blood, which is originally produced in those branches of the *vena portæ* which are connected with the stomach, &c., is perfected in the liver, and is there taken up by the extreme branches of the *vena cava* which arise in that organ, and, as has been already observed, are the *venæ cavæ hepaticæ* of modern anatomy, and is thence conveyed to all parts of the body.[o]

He recognises the analogy between milk and blood in the following terms. Milk consists of whey and cheese: Blood consists of serum, which resembles whey; and of a kind of feculent sediment, which resembles cheese. Milk, therefore, and Blood, though each appears to be of a simple and homogenous character throughout, are compound substances.[p] He observes that blood, whether arterial or venous, coagulates both within, and out of, the body: and he accounts for this coagulation, as Aristotle does, by supposing that it depends on the existence of certain fibrous particles, the absence of which prevents the blood from coagulating,[q]

m vol. .i, pp. 299, 503. and vol. v., p. 280. *n* vol. iii., pp. 272–3. *o* vol. ii., pp. 785–6. *p* vol. i., p. 496. *q* vol. vi., p. 106.

The consideration of Galen's opinions with respect to venesection is so closely connected with the present subject, that no apology need be offered for the introduction of the following statement. When Galen first began to reside at Rome, the practice of letting blood was so much dreaded by the Roman physicians, that they abstained from employing it even in the most urgent cases.[r] Galen, on the other hand, recommended it most strongly, and sometimes even "*ad deliquium*," not only in acute pleurisy and peripneumony, but occasionally both in dropsy and in gout. He observes particularly that bleeding "*ad deliquium*," in very acute fevers, will sometimes put an end to the disease.[s] He notices also the utility of abstracting a given quantity of blood in the shortest possible time, that is by a large orifice;[t] and directs the practitioner not to be deterred either by the period of the disease, or the age of the patient, provided his strength is sufficient and the symptoms demand it.[u] In some instances he recommends a division of the temporal artery.[v]

Though not immediately connected with the subject now under consideration, yet, as shewing the occasional coincidence of ancient and modern principles and modes of practice, it may be stated that Galen graphically describes some of the very details of the method of friction employed by the late Mr. Grosvenor of Oxford; and recommends the plan itself, which Hippocrates indeed originated,

r vol. xi., p. 187. *s* vol. xi., pp. 251–2; vol. xv., p. 892; vol. xvi., pp. 281, 294; and vol. xvii., pt. 2, p. 446. *t* vol. xi., p. 287, and vol. xv., p. 533. *u* vol. xi., pp. 291, 308. *v* vol. xii., p. 706.

as tending to prevent the formation of scirrhous or hardened tumours. The friction he directs to be applied gently but continuously ; and the hands of the operator to be moved over the part affected in every direction, upwards and downwards, obliquely and transversely.[w]

The Heart.—In describing the structure of the heart, Galen notices particularly the various direction and great firmness of its fibres ; but he does not consider those fibres to be truly muscular.[x] He says that what is improperly called the bone of the heart, for it is barely more than of a cartilaginous hardness except in very large animals, is placed at the root of the great vessels connected with that organ.[y] He asserts that in all animals which respire air, the structure of the heart is the same, and that it contains as many cavities in the smallest bird as in the largest quadruped, though Aristotle thought otherwise ; but that these cavities are only two in number ; the auricles, which are contiguous to these cavities, being rather appendages to the heart than integral parts of it. Of these two cavities, he says, that that on the *right* side exists in all animals which have lungs, being intended to convey blood for the nutrition of those organs.[z]

From the *left* cavity of the heart arises an artery having a *venous* coat ; which, issuing by four orifices from the appendage called the left auricle, sends its ramifications through the lungs (these are evidently the pulmonary veins of modern anatomy). And from the same cavity arises a much larger artery,

w vol. xviii., pt. i., pp. 364–5. *x* vol. ii., p. 610. *y* vol. ii., p. 622. *z* vol. ii., p. 624, and vol. iii., pp. 442, 461–2.

called by Aristotle the aorta, which is the main trunk of all the arteries of the body.[a] From the *right* cavity of the heart arises a vein, having an *arterial* coat, which proceeds to the lungs (this is the pulmonary artery of modern anatomy): and from this vein there passes an artery to the aorta (this is the *ductus arteriosus* of modern anatomy).[b] The vein having an *arterial coat* (our pulmonary artery) is considered by Galen as a part of the general venous system; being in his view a ramification of the *venæ cavæ* which communicate with the same cavity from whence itself issues. And the four arteries having a *venous* coat (our pulmonary veins), are considered by him as a part, or the root as it were, of the aorta; both vessels communicating with the same cavity. And he observes that the lungs are the only part of the body in which the *veins* have an *arterial* structure; and the *arteries*, a *venous* structure. Galen adds a clear description of the form and position of the tricuspid and mitral valves; and also of the sigmoid valves of the aorta and pulmonary artery.[c]

Arteries.—Erasistratus and others entertained the opinion that the arteries contain only air, yet allowed that they anastomose with the veins:[d] and, according to Erasistratus, the air which is inspired by the lungs passes from the extremities of the bronchia into the pulmonary vessels, which communicate with the left cavity of the heart, and thence into the aorta and its branches.[e] Galen, in admitting that the arteries contain air,[f] asserts at the

a vol. ii., pp. 616, 780, 817, 625. *b* vol. ii., pp. 817, 617, 828. *c* vol. iii., pp. 469, 476. *d* vol. iii., pp. 364, 492. *e* vol. iv., p. 706. *f* vol. iv p. 723.

same time that they naturally contain blood also: for he says that if an artery be wounded, blood immediately flows from it, without any previous escape of air; which is a proof that that blood was already in the artery; for had it made its way into the artery from any other source, the air must have first escaped.[g]

Of the vital importance of the arteries, with reference to the *quantity* of blood flowing through them, Galen was quite aware; for, in observing that an individual would be in considerable danger from a wound in any of the larger *veins*, he adds, that he could hardly escape death from a wound in a large *artery*.[h] And, with reference to the decision of the general question, whether blood is contained in the arteries, he relates the following entertaining anecdote. There are some teachers, he says, who are in the habit of advancing opinions which they are not prepared, and therefore not inclined, to put to the test. Such was the case with a certain teacher of Anatomy, who, having declared that the aorta contains no blood, and having been earnestly desired by several ardent pupils of Galen to exhibit the requisite demonstration, they themselves offering animals for the experiment, declined, after various subterfuges, to satisfy them without a suitable remuneration: on which the pupils immediately raised a subscription among themselves for the purpose, to the amount of a thousand "*drachmæ*" (equivalent, probably, to about twenty-five or thirty pounds of our money). The Professor being thus compelled to commence the experiment, to-

g vol. iv., pp. 703–4. *h* vol. iii., p. 212.

tally failed in his attempt to cut down upon the aorta, to the no small amusement of the pupils, who thereupon taking up the experiment themselves, made an opening into the thorax in the way in which they had been instructed by Galen; passed one ligature round the aorta at the part where it attaches itself to the spine, and another at its origin; and then, by opening the intervening portion of the artery, shewed that blood was contained in it.[i]

The arteries arise from the heart, and derive their pulsation from it:[k] of which one proof is, that, if the pericardium of an animal be opened, you will see the heart itself pulsating, and all the arteries of the body pulsating synchronously with it.[l] Pulsation, indeed, is perceptible in the arteries only, and not in the veins;[m] and it may be known when an artery is wounded, not only by the lighter colour of the blood which flows from it, but by the pulsative manner in which the blood is projected from it.[n] He observes, however, that, notwithstanding the force with which the blood is propelled from a wounded artery, gentle pressure of the finger is sufficient to stop its further escape; and that, during the effect of this pressure, the blood soon coagulates, and forms a natural plug within the artery.[o]

The Veins.—These vessels arise from the liver, and are destined to convey the blood, which has been perfected in that organ, to all parts of the body.[p] No pulsation is perceptible in the veins, except at the point where the "*vena cava*" joins the heart.[q]

i vol. ii., p. 642. *k* vol. iii., p. 45. *l* vol. ii., p. 640. *m* vol. ii., p. 599. *n* vol. viii., p. 5. *o* vol. x., p. 318. *p* vol. iii., pp. 45, 46. *q* vol. v., p. 563.

Office of the Arterial System.—In Galen's estimation, it was the office of the arterial system to convey both air and blood to the various parts of the body: the *blood* contained in the arteries, which is of a vaporous or airy character, being fitted for the nourishment of particular organs, while the *air* conveyed by them has the effect of cooling the constantly accumulating heat of the several parts.[r] The whole arterial system consists, according to our author, of those pulmonary vessels which terminate in the left auricle (the pulmonary veins of modern anatomy), together with the aorta and all its ramifications. And he compares these pulmonary vessels in their supposed office of attracting air from the lungs, to the roots of a tree, which attract nourishment from the surrounding soil: and he compares the aorta and its ramifications, which are supposed to receive the air forwarded by the pulmonary vessels, to the trunk and branches of a tree receiving its nutriment from the roots.[s]

Office of the Venous System.—The veins are considered by Galen as the efficient nutrients of the body at large. The whole venous system consists of the "*vena portæ*" with its ramifications, and of the *vena cava* with its ramifications; the "*vena portæ*" in the character of a root atrracting nourishment from the stomach, &c., and conveying that nourishment to the liver, through its hepatic ramifications; from which it is taken up by the ramifications of the "*vena cava,*" which have their origin in the liver; and thus, he observes, the *liver*

r vol. iii., p. 321. *s* vol. v., p. 525.

is intermediate to the roots and to the trunk and branches of the *venous* system, as the *heart* is to the roots and to the trunk and branches of the *arterial* system.[t] The pulmonary artery of modern anatomy was considered by Galen simply in the light of a branch of the general venous system; and hence, as conveying *venous* blood though itself of *arterial* structure, he called it an "arterial vein:" and he denominates our pulmonary veins "venous arteries," as attracting air, and performing therefore the office of *arteries*, though themselves of venous structure.[u]

The Lungs.—The substance of the lungs consists of the venous artery and the arterial vein, with their branches; and of the ramifications of the trachea which convey the air to those organs;[v] the extreme branches of the trachea communicating with, and conveying the inspired air to, the extreme branches of the venous artery.[x] The thorax, which contains the lungs, is divided by a membranous septum into two cavities; so that, if one be perforated, the portion of the lungs contained in the other will continue to support respiration.[y] On the upper part of the trachea is placed the larynx, or true organ of the voice: and that this is the true organ of the voice may be known by the effect of dividing the trachea below the larynx.[z]

Action of the Valves of the Heart, &c.—Although the opinions of Galen, and of the ancients in general, respecting the transmission of the blood from one part of the body to another, were of a very con-

t vol. v., p. 532, &c. *u* vol. iii., p. 468, &c. *v* vol. ii., p. 602.
x vol. v., p. 229. *y* vol. iii., pp. 417, 418. *z* vol. v., p. 231.

fused character; yet occasionally their observations and reasonings approached very nearly to those which ultimately led to Harvey's discovery of the circulation. Galen supposes that in all parts of the body there is a free anastomosis between the minute pores or channels which connect the arteries with the veins;[a] and that such organs as require a light and spirituous blood attract it from the arteries, while those organs which require a thick and heavy blood attract it from the veins, the coats of the veins being made *thin*, in order that they may readily transmit the *thick* blood, while the coats of the arteries, being *thick*, transmit only the *thin* blood.[b] The sigmoid valves of the *vena arteriosa* (our pulmonary artery) prevent the *blood* from regurgitating to the heart, when the lungs are compressed, the lungs during their compression necessarily having a tendency to force the blood back;[c] and the corresponding valves of the aorta prevent the *air*, when it has once entered that vessel, from regurgitating to the heart during its diastole.[d] In the diastole of the heart (which takes place in consequence of the attraction of air from the lungs[e]), the tricuspid valves recede from each other, and rest against the sides of the ventricle; and at the same moment the blood necessarily flows both from the *vena cava* into the auricular cavity, and from the auricular cavity into the ventricle: the auricular cavity, indeed, seems to be a provision against the otherwise too violent effect of the diastole of the ventricle on the veins which open into the auricle.[f] And when

a vol. iii., p. 455. *b* vol. iii., p. 449. *c* vol. iii., p. 456. *d* vol. iv., p. 476. *e* pp. 474–5. *f* vol. iii., pp. 480-7.

the tricuspid valves, by being attracted to the sides of the ventricle, suffer the blood to flow into it, they at the same time close the opening into the *vena arteriosa* (*pulmonary artery*), and thus prevent the blood from flowing into that vessel till the systole of the heart takes place.[g]

From some of the preceding observations, and from other observations in various parts of his works, it appears that Galen, although ignorant of the doctrine of atmospherical pressure, was acquainted with some of its practical effects. Thus, he says, if you put one end of an open tube under water, and suck out the air with the other end, you will draw up the water into your mouth; and it is thus that infants extract the milk from the mother's breast.[h] Nor will it be uninteresting to state, in connexion with the present subject, that Galen notices the effect of a ligature, round the arm for instance, in preventing the further extension of poison received from the bite of a viper.[i]

Effects of Ligatures on the Blood-vessels.—In giving an account of an experiment intended to prove that the arteries contain blood, he says, that after having made a ligature on the femoral artery, you will observe the pulsation *between* the ligature and the heart; but not between the ligature and the extremities;[k] and, in another part of his works, he makes the general observation, that the heart is evidently the source of pulsation, since, if a ligature be made on any artery, pulsation continues in that part of the artery which is intermediate to the *liga-*

g vol. iii., p. 490. *h* vol. v., p. 708. *i* vol. viii., p. 197.
k vol. ii., pp. 646-9.

ture and the *heart;* but ceases in that part of the artery which is intermediate to the *ligature* and the *extremities.*[l] But how unprepared he was for the discovery of the true circulation of the blood is evident, from the confession that he is totally unable to explain why nature, which does nothing uselessly or without design, should have made *different* vessels, namely, arteries and veins, to contain the *same* fluid.[m] And yet he knew, for he says he has often made the experiment, that, by opening a large artery, all the blood, not only of the arteries, but also of the veins, may be withdrawn from the body; and he safely concludes from the fact, that the arteries and veins must mutually anastomose.[n] Again, in describing a vein of the arm, he says it will be more distinctly seen if the arm be bound round with a fillet.[o] And, lastly, he observes that the blood which the heart receives into its *right* cavity, from the *vena cava,* it sends directly to the lungs through the *vena arteriosa* (pulmonary artery); and that from the lungs the blood is conveyed by the *venæ arteriosæ* (pulmonary veins) through the *left* cavity of the heart to the aorta; and from the aorta to every part of the body.[p]

Respiration.—Galen considers the heart as the source of the innate heat of the body; comparing it to a stove, as it were, which warms a whole house; and that the use of respiration is to moderate this heat.[q] The *right* cavity of the heart, which is considered by physicians as having a peculiar relation to the *blood,* receives that fluid by

l vol. iv., p. 683. *m* vol. iv., p. 722. *n* vol. v., p. 165. *o* vol. ii., p. 376.
p vol. ii., pp. 77, 602. *q* vol. ii., p. 615, and vol. iv., p. 671.

one orifice (the right auricle and ventricle), and transmits it to the lungs by another orifice (the pulmonary artery). The *left* cavity, which has a peculiar relation to the *air*, has a direct communication with the four arteries of the lungs (the pulmonary veins), and with all the other arteries of the body, by means of the aorta.[r] He describes two kinds of respiration ; one by the mouths of the arteries of the lungs, and one by the mouths of the arteries of the skin : in each case the surrounding air is drawn into the vessels during their diastole, for the purpose of cooling the blood ; and, during their systole, the fuliginous particles derived from the blood and the other fluids of the body are forced out.[s] He supposes that the cuticular respiration alone is sufficient for animals during the period of hibernation.[t] Galen considers the diaphragm to be the principal muscle of respiration, and sufficient in itself for that process in its ordinary degree ; but he makes a clear distinction between ordinary respiration, which he calls a natural and involuntary effort, and that deliberate and forced respiration which is obedient to the will, as in the elevation of the voice and in gymnastic exertions, which he calls an animal effort : and he says there are different muscles for the two purposes. And, on another occasion, he particularly points out the two sets of intercostal muscles, and their mode of action ; of which, before his time, he asserts that anatomists were ignorant.[u]

Though Galen entertained the prevailing opinion

r vol. ii., pp. 816, 817, and vol. iii., pp. 435–6. *s* vol. v., pp. 709, 710.
t vol. viii., p. 282. *u* vol. ii., pp. 499, 657, and vol. iii., p. 314.

of his day, that respiration is intended to cool the innate and continually accumulating heat of the heart and blood; inspiration bringing an afflux of cool air, while expiration carries off their excess of heat, and also the fuliginous particles produced by that heat; yet he affirms that the heat of the blood at the same time that it is moderated, is also absolutely *produced* by respiration.[v] He moreover conjectured that there exists in atmospherical air not only a quality accommodated or friendly to the vital spirit, but also a quality inimical to it; which conjecture he drew from observation of the various phenomena accompanying the support and extinction of flame: and he says that if we could find out why flame is extinguished by absence of the air, we might then know the nature of that substance which imparts warmth to the blood during the process of respiration.[w] And, on another occasion, he says that it is evidently the *quality* of the air, and not the *quantity* which is necessary to life; for you would be suffocated, however great the quantity of air which had been inspired, if you were to retain that quantity by closing the glottis; and, in fact, under such circumstances, the expiration or discharge of that air can alone save life.[x] In another point also, connected with the present subject, the opinion of Galen coincided with what is now known to be the fact: for while Erasistratus supposed that the vapour of charcoal, and of certain pits and wells, is fatal to life in consequence of its being *lighter* than common air, Galen maintained that it is *heavier*.[y]

v vol. iii., p. 412, and vol. iv., p. 492. *w* vol. iii., p. 541, and vol. iv., pp. 488, 492. *x* vol. iv., pp. 479, 480. *y* vol. iii., p. 541.

He describes various effects produced on respiration, and on the voice, by the division, &c., of those nerves which are connected with the thorax; and shews particularly the effect of dividing the recurrent branch of his sixth pair of cerebral nerves (the pneumo-gastric nerves of modern anatomy); explaining why the division of this branch, though the division be made on both sides, does not entirely destroy the voice. He also explains how it happens that after the division of the spinal marrow, provided that division be *beneath* the lower termination of the neck, the diaphragm will still continue to act; in consequence, namely, of the origin of the phrenic nerve being *above* the lower termination of the neck.[z]

The Urinary Organs.—Galen asserts that the urine is secreted from the blood by the kidnies; and that the ramifications of the renal arteries may be traced to the cavity (the pelvis) of the kidnies. He does not, however, suppose that the secretion takes place from the arteries, but from the veins. The opinion of Erasistratus on the foregoing point, which is exceedingly ridiculed by Galen, is this—that, the blood being received in the upper part of the kidney, its serum sinks to the lower part of that organ: with reference to which opinion Galen asks, why this subsidence did not happen while the blood was in the *vena cava*.[a]

In describing the course of the urine from the kidney to the bladder, he relates some experiments made by him on living animals, the character of

[z] vol. ii., p. 699. [a] vol. iii., pp. 363–6 and 57, 68.

which, in connexion with his reasoning on the phenomena, is curiously analogous to Harvey's experiments and consequent deductions relative to the circulation of the blood. If, he says, you open the abdomen of a living animal, and make a ligature on the ureters, you will find that no urine passes into the bladder; but after having loosened these ligatures, you will observe the bladder become gradually distended with urine.[b] And if, when the bladder has been distended with urine, you fix a sufficiently tight ligature on the penis, and compress the bladder even with considerable force, you will find that no urine repasses into the ureters; and for this he accounts by the oblique entrance of the ureters into the bladder; the obliquity of the entrance forming a natural valve; the action of which valve, he adds, is so perfect, as to prevent the regurgitation not only of liquids, but even of air, as is proved in the common inflation of the bladder of any animal.[c]

In answer to some contemporary physiologist, who asserted that the urine is only the excrementitious portion of that blood which nourishes the kidnies, Galen gives an admirable specimen of just physiological reasoning; for, from the very large size of the renal blood-vessels compared with the size of the kidnies themselves, he argues that those vessels were not intended solely for the nourishment of the kidnies, being capable of affording nourishment to organs of a much larger size: and he therefore concludes, that, from the blood contained in them, not only are the kidnies nourished, but the urine is also secreted.[d]

b vol. ii., p. 12. *c* vol. iii., p. 390. *d* vol. iii., pp. 363-6.

I need hardly state that the operation of lithotomy was familiar to medical practitioners of Galen's age: but, as a circumstance in connexion to a certain extent with the present subject, though relative to a period long subsequent to the age of Galen, I may be permitted to mention that an attempt at the lithontriptic practice was made in the twelfth century by Avenzoar, an Arabian physician of Spain, whose writings will amply repay the trouble of their perusal. The attempt, indeed, was confined to the limits of the urethra, and the form of the instrument differed from that of the present day; but the principle of the operation was the same. After having described the common method of *extracting* a calculus from the urethra, Avenzoar teaches you how you may *break* it in pieces by a "thin polished rod, made of gold or silver, and having a pointed adamant *enchased* in its extremity."*

The Uterine System.—Although Galen occasionally describes the human uterus in terms which are more appropriate to the uterus of brutes, yet in one part of his works the description is apparently drawn from the human subject; for, after having described the "fundus," he says that it has processes on each side resembling "cornua;" and then he graphically describes the Fallopian tube.[e] And, on another occasion, after having observed that the right

* Accipe virgam subtilem, bene politam, ad modum styli, de ære, vel argento, aut auro: et desuper fac *incassare* punctam unam de adamante; et pone per *foramen virgæ*, urethram, usque quo attingat *lapidem;* et ipsum poteris *frangere* cum. ea.—"*Theizir Abynzoar. Latinè. fol. venet.* 1549, *lib.* 2. *tract.* 4, *cap.* 1."

e vol. iv., pp. 535-7, and 593-4.

side of the body corresponds in almost all its details with the left side, he notices the symmetrical form of parts, which, though really single, are virtually double; their left side closely corresponding with their right; as the tongue, the under jaw, and the *human uterus*.[f] His description of the uterine arteries and veins, though incomplete, is tolerably correct as far as it goes: so also is his description of the formation of the placenta; and, although he applies the term "cotyledon" to the placenta, yet the use of the term is justified by the context.[g] He gives a good description of the origin, and course, and termination, of the small placental veins and arteries: and, although he describes two umbilical veins as well as two umbilical arteries, he adds, that these two veins, after they have penetrated the umbilicus, become one vein; which is immediately forwarded to the liver. He also describes with tolerable precision the ramifications of the umbilical vein within the liver; and also the course of the umbilical arteries.[h]

The following opinion is curious as compared with very recent speculations on the development of the animal form. Galen asserts, in opposition to some other physiologists, that the branches of arteries and veins are not formed progressively from the trunks; but that the "*nisus formativus*" is going on in all parts of the system at once. And he affirms that, about the thirtieth day after conception, the heart, the brain, and the liver, are distinctly visible; the liver being much the largest of the three.[i] In com-

f vol. v., p. 789. *g* vol. ii., pp. 894, 905. *h* vol. iv., pp. 656, 662. *i* vol. iv., pp. 662, 686.

pliment to Hippocrates, it would seem, whom he ranks above even Plato and Aristotle, he entertains the absurd opinion that the male embryo usually occupies the right side of the uterus, and the female the left.[k]

Galen's opinion on the nature and source of the catamenial discharge, accords generally with that of modern physiologists. The discharge itself proceeds, he says, from the inner surface of the uterus, through the same orifice in its neck by which the embryo passes. In its character he considers it as somewhat different from the blood; observing that at the period of the catamenia, the inner surface of the uterus is bathed by a moisture of a sanguineous nature, which has been secreted from the blood.[l]

The Bones.—To give a detailed account of Galen's osteology would be almost the same as repeating the treatise of any modern writer on that subject. He informs us that human osteology may always be studied with facility at Alexandria in Egypt; the medical teachers of that school having long been accustomed to prepare human skeletons for the purpose of their anatomical lectures.[m]

The Muscles.—Galen describes the muscles as the immediate moving powers of a limb; joints, &c., being necessary auxiliaries.[n] Among the most beautiful of his descriptions of these instruments, may be reckoned that of the uses of the "*brachialis internus,*" and of the "*biceps flexor cubiti,*" both in their separate and in their combined action; and the description of the position and action of the ab-

k vol. iv., pp. 150-4. *l* vol. ii., pp. 897, 903. *m* vol. ii., p. 220. *n* vol. i., p. 235.

dominal muscles, in the expulsion of the fæces, and in various vehement exertions.[o] Thus, after having accurately detailed the mode of action and use of the "*sphincter* and *levator ani*," he shews that, while the straight and oblique muscles of the abdomen, in compressing the intestines, would force their contents equally towards the stomach as towards the anus, the diaphragm forces them in the right direction downwards: and, lest the action of the four pair of abdominal muscles should counteract the diaphragm, this is prevented by keeping the lungs in a distended state.[p]

The Nervous System.—Galen remarks that sensation and voluntary motion essentially distinguish animals from plants: and that, on this principle, nerves constitute a muscle an *animal* organ; which, with reference solely to its arteries and veins, &c., is a merely *physical* organ. He supposes, however, that nerves do not possess an inherent and independent power, but whatever power they have is derived from the brain; from which, though they have no perceptible cavity within them, they are capable of conveying sensation and power of motion to the most distant parts of the body.[q]

He conjectures that there are nerves for three distinct purposes; namely, for sensation, for motion, and for the discrimination of what may be salutary, and what injurious to the system; the last-mentioned belonging particularly to the stomach and intestines, and to the urinary bladder; and that, in consequence of this "organic sensibility," for to

o vol. iii., p. 154, and vol. ii., pp. 540, 588, &c. *p* vol. iii., pp. 397, 403.
q vol. iv., pp. 371–2, and 528.

Galen's doctrine that term may be justly applied, these parts are capable of attracting or repelling whatever may be respectively useful or the contrary.[r]

He makes a distinction between the powers of voluntary and involuntary motion; and observes that those organs of sense which are obedient to voluntary motion, as the eyes and the tongue, require consequently, two sets of nerves: and, with respect to the tongue, he points out particularly those nerves which belong to it as an organ of taste, and those which render it capable of voluntary motion.[s]

The Spinal Marrow.—After having enumerated the nerves belonging to the spinal marrow, all of which, he says, arise in pairs,[t] he observes that it is evident, from many phenomena, that their functions are dependent on the brain. Thus, if the spinal marrow be divided in any part, all the nerves which arise from it *between* the point of division and the brain, retain the power of imparting sensation and motion; while all which arise from it *below* the point of division, are incapable of imparting sensation or motion.[u] In order, consequently, to be enabled to ascertain the situation of disease in the spinal marrow, it is necessary, he says, that the practitioner should know to what parts of the body the several pairs of spinal nerves are distributed.[v] And on this subject, on another occasion, he shews in how philosophical a spirit he pursued the practice of medicine; for, being called to a patient who had for some time lost the sense of feeling in some

r vol. iii., p. 384, &c. *s* vol. iii., pp. 634, 800. *t* vol. ii., p. 831.
u vol. i., p. 234, and vol. iv., p. 679. *v* vol. viii., pp. 237–8.

of his fingers, and had derived no benefit from local applications to the fingers themselves, Galen inquired whether he had ever met with any injury of the spine; and, having been informed that he had fallen on his back some time previously with considerable violence, Galen applied remedies to the part on which he had fallen, and thus restored sensation to his fingers.[w] He subsequently relates the effects of many experiments which he made, in order to prove that, by the division of the spinal marrow in various parts, both the power of motion and sensation are destroyed in those muscles which are connected with the divided parts.[x]

The Sense of Smelling.—Galen asserts that the sense of smelling is only in operation during the act of inspiring through the nostrils; that part being lined by a membrane on which are distributed small nerves from the brain, which receive the requisite impression from the odorous particles as they pass with the air through the nose. And he supposes that when the nerves of the brain enable the muscles of the thorax alternately to expand and contract that region, a slight expansion and contraction take place simultaneously in the brain itself; and that, during inspiration, the odorous particles pass through the foramina of the cribriform plate of the ethmoïd bone into the anterior ventricles of the brain.[y] In addition to its function as the organ of smelling, Galen considers the nose, together with the palate, as an emunctory of the brain;[z] and that, by the way of the canals of

w vol. ii., p. 343. *x* vol. ii., p. 683, &c. *y* vol. ii., pp. 861, 883. *z* vol. i., p. 294.

the two long and hollow processes, which are a continuation of the anterior ventricles, the *grosser* humours of the brain pass from thence through the cribriform plate of the ethmoïd bone, during the act of expiration; the *finer* humours passing through the sutures of the cranium.[a] (In the preceding passage it is evident that Galen takes his description not from the human brain, but from that of some quadruped). Galen also considers as an emunctory of the brain "that glandular body which is placed towards the anterior part of the base of the brain, and into which a membranous infundibulum descends; from whence, through the pores of the subjacent bone, in a depression of which it is imbedded, the thick excrementitious phlegm of the brain passes to the roof of the mouth."[b] It naturally here occurs to the recollection, that the term which was applied by the Romans to the supposed excrementitious phlegm of the brain is "pituita;" and that it is in reference to the opinion entertained by the ancients, namely, that the increased production and retention of that humour deadened, or otherwise affected, the intellectual faculties, that Horace expresses himself in the well-known line—"*Præcipue sanus, nisi cum pituita molesta est.*"

The Sense of Sight.—Galen does not give a clear history of the eye and of its appendages; but particularly of its muscles, the description of which seems applicable to the eye of the quadruped rather than of man. It is worth noticing, however, that most of the descriptive terms are, in this, as in every other part of his Anatomy, the same as those which are now in use.[c]

a vol. ii., pp. 885, 858. *b* vol. iii., p. 693, &c. *c* vol. iii., pp. 781-798.

The Brain.—The mutual connexion of the several parts of the brain had been so well investigated, particularly by Erasistratus, before the time of Galen ; and the descriptive terms are so nearly the same as those now in use, that it will be sufficient for the present purpose to have stated the general fact, without adding Galen's description of that organ.

He asserts that the use of the "pia mater" is to hold together the arteries and veins of the brain, and also to give support to the substance of the brain, and prevent it from collapsing : and, in alluding to the comparison of this membrane with the "chorion" of the embryo, he expresses his surprise that anatomists should restrict the term "choroïd" to that part of the pia mater which lines the ventricles, and not extend it to the whole investing membrane.[d]

In stating the fact that all the nerves which arise from the brain and spinal marrow arise in pairs, he adds his opinion, which he expresses also in another part of his works, that sensation and voluntary motion are dependent on the brain through the medium of these nerves. But it was the opinion of many anatomists in Galen's time, that sensation and the power of motion are not derived from the *same* nerves ; and, upon the whole, Galen himself thinks it probable that *soft* nerves are appropriate to *sensation,* and *hard* nerves to motion.[e]

In enumerating the order of the nerves arising from the base of the brain, he begins by a confused description, which is partly applicable to the optic

d vol. iii., pp. 656-8. *e* vol. ii., pp. 831, 342, 613.

nerves, and partly to the olfactory nerves, or rather *lobes*, of some quadrupeds: and he finally determines the optic nerves to be the *first* pair; of which nerves, he affirms, that they are united, but without decussation.[f]

The *second* pair, he says, are distributed to the muscles of the eye; which clearly answer to the "*motores communes*" of modern anatomy. He makes no mention of the "*pathetici*:" and, considering their position and great delicacy, the omission cannot excite any surprise.

Galen's *third* and *fourth* pair answer conjointly to the "*trigemini*" of the moderns; and from these, he says, arise the nerves of taste. His *fifth* pair comprise both the "*portio dura*" and "*portio mollis*" of the seventh pair of modern anatomy; and, having made a very clear distinction between the auditory nerve and that portion which passes through what he calls the rock-like bone, and then becomes mixed with the branches of his *third* pair (the "*trigemini*"), he then says of these two portions, "let these be called *one* pair, in compliment to my friend Marinus, though they are evidently *two* pair."[g]

Galen's *sixth* pair will easily be recognised as answering to the eighth pair of modern anatomy; for he says of them, that, although they arise from different points within the cranium, they yet become united in their exit from that cavity; that they give branches on each side to the muscles of the larynx; on which branches if a ligature be made, or on the trunk near the carotid artery, the animal becomes

[f] vol. ii., p. 832, and vol. iii., p. 813. [g] vol. ii., p. 839.

dumb ;[h] that some of the branches, after having entered the thorax, pass up in a retrograde direction to the muscles of the larynx ; and that, if these branches be injured, the voice of the animal is impaired though not destroyed. Galen asserts that he first discovered these branches, and, from the peculiarity of their course, gave them the name "recurrent." He proceeds to say that the same *sixth* pair give branches to the lungs, the heart, and the stomach, but not a single branch to the diaphragm, though some anatomists thought otherwise ; that, beneath the diaphragm, some of the branches unite with nerves connected with the spinal marrow, and with the liver, spleen, stomach, and intestines.[i] In another part of his works he describes the branches of this same *sixth* pair as connected with certain tumours, or "ganglia," both in the thorax and abdomen, which ganglia, he says, are of the same substance with the nerves themselves, and are a provision of nature, whereby, whenever a nerve takes a long course, or is destined to excite great power in any part, the ganglion acts as a new source of nervous energy ; and he adds that this mechanism of nature was first discovered by himself.[k]

Galen's *seventh* pair are evidently the "*linguales*" of modern anatomy ; for he describes them as distributed to the muscles of the tongue.[l]

With reference to the relative importance of wounds in different parts of the brain, he says, that in making experiments on living animals, he has

h vol. ii., p. 841. *i* vol. ii., pp. 841-4. *k* vol. iv., p. 289, &c. *l* vol. iii., p. 730.

often observed that not only large portions of the "*dura mater*," but even of the brain itself, may be cut away without loss of either sensation or power of motion, provided you do not penetrate into the ventricles; and that wounds of the fourth and middle ventricle are more dangerous than of the lateral ventricles.[m]

Phrenology.—Erasistratus, in observing that the human brain has more convolutions than that of other animals, adds that this complication of structure is connected with the superior intelligence of man.[n] But Galen, while he confesses that the nature of the soul or immaterial principle necessarily becomes the subject of contemplation in describing the structure of the body, would refer the degree of intelligence rather to the just temperament of the body than to the complication of the form of any part of it.[o] He asserts, however, that the reasoning spirit or power resides in the brain, and that this organ is the instrument by which that power manifests itself.[p] He allows, moreover, that various intellectual powers and physical structures are indicative of various constitutions of the brain.[q] And on one occasion he observes that an unusually *small* head is never accompanied by great talents; adding, that although the same observation is, in ordinary cases, applicable to an unusually *large* head also, it is not applicable in those cases in which the form of the head corresponds with the just symmetry of nature; and such an exception existed, he adds, in the instance of Pericles.[r] Fi-

m vol. v., pp. 606–7. *n* vol. iii., p. 673, and vol. v., p. 603.
o vol. iii., p 674. *p* vol. iii., p. 700. *q* vol. i., p. 322, &c.
r vol. xvii., pt. i., pp. 818, 819.

nally, he observes, and his observation may be used as a philosophical check on the rash application of Dr. Gall's theory, that, on all occasions, when speaking of the moral actions of men, as connected with their temperament, he only speaks of their "innate propensities," not of their "conduct," when considered as the result of discipline and education.[s]

[s] vol. i., pp. 336–7.

ARTICLE VI.

ON THE TREATMENT OF HYPERTROPHY OF THE HEART, AND CHRONIC OR SUB-ACUTE INFLAMMATION OF THE PERICARDIUM,

ESPECIALLY IN REFERENCE TO THE BENEFICIAL USE OF SMALL DOSES OF MERCURY IN THOSE AFFECTIONS.

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In the majority of cases of considerable organic disease of the heart, it is generally admitted by pathologists, that nothing hitherto discovered has succeeded in entirely restoring it to a normal condition. In the early stages of hypertrophy, it is perhaps possible that the plan of treatment recommended by Valsalva and Albertini, for the cure of aneurisms of the aorta, might occasionally be attended with success. Under these discouraging circumstances, it is with great deference that I venture to recommend to my professional brethren a

method of treatment which I have, in my own practice, found eminently useful; not, indeed, in completely removing the diseases in question, but in arresting their progress, essentially relieving some of their most distressing symptoms, and greatly prolonging the life of the patient.

Though the treatment to which I here allude embraces the subject of regimen, general management, and the application of various agents, its successful issue chiefly depends on the exhibition of small doses of mercury. Where a variety of means are had recourse to in a given case, it is often difficult to determine how far the benefit derived may be ascribed to the operation of any individual remedy, or how much may have depended upon their conjoint influence. Having, however, within the last few years, been frequently called upon to treat affections of the heart, I have, I think, had a sufficient opportunity of testing the relative value of the several remedies which I have employed.

The greater number of cases that have hitherto come under my care, have been instances of hopeless organic disease, and, in such, nothing much beyond palliation could reasonably be looked for; but by the present improved methods of diagnosis, we are enabled to detect an early departure from a healthy state of the central organ of circulation, and, consequently, may anticipate more satisfactory and lasting results from the treatment. Taking this view of the subject, too much importance cannot be attached to the early discovery and discrimination of cardiac disease. But it is an important object, if not the chief one of this paper, to point out what

I conceive to be the best method of treating those distressing cases in which the disease has made so serious a progress that we cannot reasonably expect its entire removal; and I trust I shall be able to show that we possess the means of staying the progress of morbid action, to an extent that has not commonly been thought possible; and that those persons who have the misfortune to labour under incurable disease of the heart, may, notwithstanding, in a considerable degree, be rendered capable of enjoying the pleasures of life.

The *modus operandi* of mercury in inflammatory diseases of the heart, is no doubt the same as in other inflammations now so generally understood. Its remedial influence is exerted on the capillary vessels; and if we merely glance at the pathology of the disease we are considering, taking into our estimate not only the condition of the heart itself, but the concomitant state of other organs, whether antecedently or consecutively affected, we shall be at no loss to understand the striking benefit sometimes observed from the employment of this active and valuable medicine.

More than twenty years ago, when our knowledge of the pathology of thoracic disease was vague and imperfect, my attention was arrested by the congestive condition of the lungs, and more especially of the lining membrane of the air passages in persons who had died from heart disease; and Lawrence informs us that the capillary vessels of other parts are in a similarly weakened and distended state. After the lungs, the liver appears to suffer more from disease of the heart, than any other

organ. Any obstruction to the course of the circulation through the chest must necessarily, from anatomical causes, lead to hepatic congestion; and congestion, we know, is often the prelude to lesions of structure: hence we have secondary disease set up in the liver, which may by a reflexed action augment the primary malady of the heart itself.

For the cure of heart disease, it is an object of great moment to attend to its consecutive influence upon distant organs, more particularly to the effect produced upon the respiratory apparatus and the liver. Indeed, if the appropriate remedies for the induced pulmonary and hepatic diseases be not employed, all our endeavours will sometimes prove abortive; but happily for our patients, the means that are found effectual in removing the primary complaint, are often the best suited for such as are superinduced by it; and this applies more especially to the prudent exhibition of mercurials.

The remedial influence of mercury for the cure of inflammation generally, is perhaps more strikingly manifested in its effects upon the serous and fibrous than on any other of the animal tissues; and as it is these tissues which suffer in all the varieties of pericarditis, we might, *a priori*, have expected that mercury would constitute our most valuable and energetic remedy in inflammatory affections of the heart Though in acute inflammation of this organ and its investing membrane this expectation has been verified by the experience of many eminent practitioners, it has remained to be shewn that a modification of the mercurial treatment is a powerful means of checking the progress of those slow

organic changes, which, if they do not destroy life so rapidly, are nevertheless as certainly fatal as the more active diseases, if allowed to go on uncontrolled by efficient treatment.

The general symptoms of disease of the heart that indicate the use of mercury, are few: the chief are, dyspnœa or breathlessness, brought on by exercise, particularly walking up an ascent; difficulty of breathing, occasioned by stooping, and an unnatural or irregular state of the pulse, not otherwise to be explained. The local signs shewing the necessity for its employment are more numerous, and are such as prove the existence of hypertrophy with or without dilatation, diseases of the valves, inflammation, &c., &c. Of these the principal are, an impulse produced by the heart's systole greater than natural; an irregular and tumultous action of the organ, with a strong ventricular contraction and loud sound; the different modifications of the bellows sound, especially, if combined with permanent, violent pulsations in the neck either arterial or venous; and dullness of the chest on percussion beyond the usual cardiac region: this last symptom, however, is not always present, even when the heart is considerably enlarged. An emphysematous state of those portions of the left lung naturally covering the heart coexisting, will occasion the præcordia to be more than commonly sonorous. By practitioners who do not avail themselves of the assistance of auscultation, disease of the heart may often be mistaken for water in the chest, or *hydrops pericardii;* but if the respiratory murmur be heard in the erect position at the most inferior parts of the chest,

and percussion elicit a natural sound, there can be little or no fluid in the thoracic cavities; these diseases may be, and indeed are, often conjoined, one being commonly the offspring of the other; but even here the diagnosis is readily cleared up by the history of the case, which will not fail to shew which was the primary affection.

In the dissections which I have had an opportunity of making in these cases, I have found more or less adhesion of the parietal pericardium to the heart; sometimes the adhesion is complete, while occasionally there is only an opacity of the membrane; hypertrophy, generally with dilatation, and more frequently of the left ventricle than of any other part; thickening of the valves with earthy deposits, between the tissues, and about the vicinity of the cardiac orifices.

Authors who have treated of diseases of the heart, have mostly divided pericarditis into two kinds, the "acute" and the "chronic;" the latter, which is the more common variety, is described as being sometimes attended by the formation of coagulable lymph on the surface of the pericardium, and generally with a sero-purulent effusion into the pericardial sac. My observations have led me to believe that there is another and a milder form of the disease, and which has not received that attention which its importance demands: this modification of pericarditis, I conceive, consists in congestion and an increased vascularity of the tissues, but to an extent not greater than would constitute what is understood by hyperæmia. It is mostly unattended with effusion, or sensible thickening of the mem-

branes ; it may, I apprehend, often be a primary affection, but is, I think, mostly secondary, accompanying hypertrophy, and chronic diseases of the heart, and that depraved state of nutrition which leads to a thickening of the valves and to the deposition of earthy matter beneath the endocardium in the vicinity of the cardiac orifices. My views on this subject are perhaps best illustrated by what takes place in diseases of another organ, possessing analogous structure—the Eye. Though inflammation of the serous and fibrous membranes of the eye frequently terminates in the destruction of this important organ of sense, some individuals, especially those of a rheumatic diathesis, are subject to a condition of the eye, which hardly amounts to inflammation, but rather consists of congestion or hyperæmia. There is a zone of distended vessels in the sclerotica around the margin of the iris ; the iris itself is only discoloured in a moderate degree or not at all, and there is occasionally some congestion of the conjunctiva lining the lids, with enlargement of some of its vessels running over the globe. This state may exist for a considerable period, and when removed by proper management, will recur from taking cold, or from a disordered condition of the digestive organs. Even this minor degree of inflammation existing in the heart will, as is plainly demonstrated to us in the eye, if uncontrolled, lead to the most serious consequences, and may at any time quickly pass into a morbid action of the vessels of a more active kind, and surprise us with a result we did not anticipate. The inflamed state of the pericardium here referred to, gives rise

to the tenderness between the ribs in the cardiac region, and beneath the ensiform cartilage, observed in chronic cardiac affections.

The treatment which I shall now proceed briefly to detail, is applicable to all varieties of chronic diseases of the heart, with the exception of the simple dilatation of its cavities, designated by Corvisart "passive aneurism of the heart." This disease, indeed, may require remedies of an opposite nature; but as I am not writing a monograph on diseases of the heart, but merely a few observations to illustrate my views relative to a certain diseased condition of the organ, and the mode of relief in several of its important diseases, it is not necessary that I should further allude to the above exception.

In the management of these cases, it is a matter of the first importance to ascertain, as far as may be possible, if the quantity of blood bear a due proportion to the powers and condition of the heart to circulate it. There may exist a relative, though not an absolute plethora: under such circumstances, it will be proper to commence the treatment with venesection; but if this should not be required either by the cause referred to, or by the presence of concomitant inflammation in any other viscus, I at once proceed to administer mercury. I am not aware that it is material which of the pharmaceutical preparations in common use be selected; this may be determined by the constitution of the patient, and the peculiarities of the individual case: but in my own practice I have generally employed the pilula hydrargyri. The object is to make the gums slightly tender as soon as it can be done, and with

the smallest possible quantity of the mineral, and to keep up very moderate mercurial action for some little time after the symptoms have been relieved.

Those who have not witnessed the amelioration of the symptoms, as soon as the constitutional effects of the mercury are produced, would scarcely think it credible that so much good could be effected in so short a space of time. I have seen patients affected with orthopnœa unable but for a short period to bear the recumbent posture, and scarcely able to walk across their chambers, or to stoop to tie their shoes, labouring also under anasarca of the feet and legs, lose in a week all the general symptoms of their disease, walking about apparently in their former health ; and this benefit has been brought about without any evident operation of the medicine, besides its influence upon the mouth. But cases will, however, often present themselves of a complicated nature, requiring more than this simple mode of treatment. Of this kind is inflammation of the bronchial mucous membrane associated with heart disease. A congestive state of the pulmonary mucous surface is, I believe, common to all diseases of the heart, more especially to an abnormal state of the left cavities, attended by obstruction at the orifices of communication : when the congestion occurs in a notable degree, it presents an obstacle to the circulation of the blood through the lungs, and retards the passage of that fluid from the right to the left side of the heart. This condition of the pulmonary circulation not only leads to an undue distension of the right

auricle and ventricle, but to an imperfect decarbonization of the blood. The circulation in the brain of carbonized blood added to nervous irritation and want of rest, is often found to give rise to considerable cerebral disturbance, and a train of symptoms not unlike those of delirium tremens.

To remedy inflammation of the bronchial mucous membrane under these circumstances, general bleeding is mostly required, and I have always found it most useful when it produced a tolerably marked impression upon the heart's action; but prudence would suggest that the patient be placed in a situation instantly to assume the recumbent posture on the approach of syncope. Leeches applied at the upper part of the sternum and beneath the clavicles are sometimes advantageous, but as there is some danger that the necessary sponging and poulticing may give cold, I have generally preferred blisters and sinapisms, from the use of which great good is often experienced. The blood drawn from the arm is frequently found buffed, and cupped. The employment of vascular depletion and counter-irritants ought not to interrupt the use of mercury, so essential for removing the morbid action of the capillary vessels of the heart and pericardium, without which the relief from blood-letting will too frequently be imperfect and transitory. Depletion alleviates the congestion and oppression of the chest, and gives time for the establishment of mercurial action, and it also directly contributes to remove a disease, (bronchitis,) which of itself is often highly dangerous. Indeed, I am convinced from attentive

observation, that death is frequently hastened, if not produced, either by failing to notice, or not actively treating, the morbid condition of the bronchial mucous membrane existing in cardiac diseases. Cold, we know, acts as a stimulus to the pulmonary mucous membrane, and the disordered state of this tissue in heart disease increases its susceptibility to be impressed by atmospherical vicissitudes. Persons not aware of this fact, by exposing themselves in the winter season, often put their lives in imminent danger. For the same reason, epidemic influenza becomes highly hazardous to individuals suffering from disease of the heart. So decidedly am I impressed with the correctness of these views, that I consider it much more important to this description of patients to be placed in the winter under the influence of a regulated warm temperature, than to the truly consumptive. Bronchitis, under the circumstances above alluded to, may or may not be accompanied with pyrexia: there will frequently be a sense of soreness at the front of the chest, and more or less of permanent oppression of the breathing, with cough; occasionally, also, there are exacerbations of impeded respiration simulating the paroxyms of asthma. A loud mucous rattle can often be heard whilst sitting by the side of the patient; but in less obvious cases the stethoscope will rarely fail to discover both the sibilant and sonorous rhonchus, with the occasional absence of the respiratory murmur in some parts of the lungs, at the same time that percussion elicits a natural sound. The expectoration is at first frothy,

with mucus; later in the disease it is muco-purulent, and in some cases tinged with blood.*

There are yet other complications of morbid actions coexisting with diseases of the heart, of great moment to consider in reference to the treatment; these are the several varieties of hydropic effusions: general anasarca, and œdema pulmonum, are those which most frequently occur. Ascites in these cases may arise from a secondary affection of the liver, or from a congested state of the portal system; the liver and peritoneum in the latter instance being in a comparatively healthy condition. It will not be found difficult if the kidneys be sound to bring the ascites under the influence of medicine. Dropsy as a sequence to these diseases, is almost universally to be ascribed to the obstruction which they offer to the due circulation of the blood.

If the dropsy be not considerable, or do not materially interfere with the functions of any of the vital organs, it may safely be left to the mercurial influence for its removal; mercury in these disorders often proving the most efficient diuretic. In cases of a graver description, it will be necessary to avail ourselves of the use of other remedies, or our pa-

* Though in the preceding observations, I have dwelt chiefly on depletion and counter-irritants for the relief of bronchitis, attendant on diseases of the heart, I wish them to be understood as applying more particularly to cases of an acute character; for I am, from observation, led to believe, that the mercurial action exerts a very beneficial influence upon the congested bronchial mucous membrane, and that in mild cases mercury alone may be depended upon. At the same time, I must disclaim any intention of advocating mercurialization for the cure of inflammations of mucous membranes generally. Its specific and local action on the mucous tissue of the alimentary canal, under such circumstances, might prove highly injurious.

tients' lives may be cut short ere the mercurial action can have time to arrest the morbid process going on. I have not found digitalis or the ordinary diuretics of much efficacy in these circumstances; but if the patient have sufficient strength to admit of its employment, I have generally found elaterium to be depended upon. Should the constitution be tolerably firm, it may be given without fear. The safest test which I have observed for the propriety of using it, is a firmness of the anasarcous swelling. If the limbs be very soft, doughy, and transparent, something more mild should be tried. When the elaterium has carried off the dropsical effusion, which it will frequently and readily do, the use of mercury ought immediately to be commenced, and cautiously persevered in, until the gums are slightly sore. This moderate degree of mercurial influence should be kept up until the breathing is decidedly relieved, and for some short time afterwards, and should again be had recourse to on any recurrence of the difficulty of breathing. In this manner, by the use of elaterium, mercury, and, if in the winter, confinement to the house in rooms whose temperature should never be below 50 F., the complaint may be kept at bay, and the fatal event warded off for a very long period.

As many of the cases to which this paper has reference, occur in individuals whose constitutions are broken by intemperance and other causes, an objection may be raised in them to the use of mercury, on account of its generally debilitating influence. It is not disputed that instances may arise in which this objection ought to be considered a

valid one; but in diseases that are confessedly fatal, the difference of opinion can only bear upon the point of time, and if it can be shewn from experience that life is prolonged for ever so short a period, it falls to the ground. The objection appears to be somewhat hypothetical, and I do not see the propriety of urging it in cases of such extreme emergency.

The subject of regimen in chronic diseases of the heart is one of great importance. In general, it must be left to be regulated by the circumstances of each individual case, but as a rule for the most part to be observed, it should be mild and but moderately nutritious: it will often be necessary to interdict the use of animal food, and fermented liquors of any kind can rarely be taken with propriety.

I shall conclude this communication by subjoining a few cases condensed from my note book, which I venture to hope will not only illustrate my views on the subject of chronic diseases of the heart, but shew the utility of the treatment I have been endeavouring to recommend.

Case I.—The subject of the following case is a gentleman about forty-five years of age, of low stature, somewhat stoutly made, with a ruddy complexion, and short neck. He suffered from an attack of typhus fever, accompanied with inflammation of the chest, in the year 1830. Soon after he became convalescent, his pulse was observed to be irregular, and his breathing somewhat short. Towards the latter part of the year 1831, the difficulty of breathing became more troublesome, especially

on taking exercise. In the early part of the year 1832, the dyspnœa was so urgent that the patient was unable to walk, or to ride at a slow pace on a quiet pony, which he had before been accustomed to do; he could not, without inconvenience, lie on his sides, or sleep, unless his head and shoulders were much raised: there was at this time also swelling about the feet and ancles; the colour of the cheeks and lips was darker than formerly, and there was some cough, with mucous expectoration. On examining the chest, the heart was found to beat with unusual force; and so tumultuous and irregular was its action, that the natural rythm was entirely lost. Percussion of the chest, on the left side, afforded a dull sound over a wider surface than the usual cardiac region; there was no *bruit de soufflet*, but the sound of the heart's action was loud, and could be heard over the greater part of the superficies of the thorax. There was mucous rhonchus in the larger bronchi; the respiratory murmur was natural.

In May the patient consulted an eminent surgeon in London, who supposed his complaint to be water in the chest: he obtained partial relief from the treatment this gentleman directed. In August, 1833, he suffered an attack of acute rheumatism, which affected most of his joints; after some time, it became sub-acute, and continued so for several months. Subsequently to this rheumatic attack, there was a manifest increase of the cardiac disease.

He was visited on May 9th, 1835, on account of an attack of bronchitis, which was accompanied with inflammation of the pericardium. For this

attack he was bled from the arm, and locally by leeches; he also had a blister to the chest, and took small doses of the pilula hydrargyri until the gums became slightly sore. The mercurial action was kept up, and he was convalescent at the end of the month. On the twelfth of June he had a return of the disease, which was removed by the same treatment.

In the beginning of August he again complained of increased difficulty of breathing, and more violent action of the heart, on taking exercise. As there was no particular bronchitis at this time, he was merely directed to resume the pilula hydrargyri, from which he experienced the most decided benefit. Early in September he took cold, which brought on a return of bronchitis, accompanied, as heretofore, with great congestion of the lungs and unusual disturbance of the heart's action. It was again deemed necessary to take blood from the arm, and this produced much temporary benefit: the blue pill was again had recourse to, and as soon as the gums had become tender, he was decidedly better.

In the early part of October, he suffered from a recurrence of the breathlessness, and palpitation of the heart, on taking exercise, especially walking up stairs; his ancles and feet were also swollen. At this time he was urged to take the advice of some practitioner in town, where he arrived with considerable difficulty. On October the 17th, he consulted Dr. Bright, who concurred in the opinion previously given respecting the disease of the heart. The patient felt extremely ill while in London, and was so much alarmed at his distance

from home, that he returned into the country without taking the medicines which had been recommended to him. On the 23rd I visited him, and found him labouring under sub-acute bronchitis, with violent and tumultuous action of the heart, and tenderness between the ribs on the left side and below the ensiform cartilage. I recommended him to pursue the plan of treatment from which he had heretofore received so much benefit; he was, therefore, bled from the arm, took the pilula hydrargyri until the mouth was sore, which no sooner happened than his breathing became easy, and he was able to lie down in bed, and to take gentle walking exercise in his house. He continued to take small quantities of blue pill till the end of the year, but rather as a precautionary measure than from any absolute necessity. So convinced now is the patient of the value of this remedy in his complaint, that since this period he never will be without it in his house; and whenever he feels his breathing at all difficult, he takes his pills until he finds relief, which he never fails to experience after a short period. He has had a fire in his bedroom during the winter, and has not been allowed to go out of doors. By taking these precautions, he has been enabled to escape the attacks of bronchial inflammation, from which he had hitherto suffered so much. He drinks nothing but water, and eats sparingly of animal food. In the foregoing narrative, the state of the pulse has scarcely been adverted to. During the bronchial inflammation it was so irregular and indistinct, as scarcely to be felt: between the attacks it has generally been

about 80, but irregular, small, and weak, when compared with the heart's action.

The foregoing case is a very important one, strikingly illustrating the benefit that may be expected from the plan of treatment which it is the object of this paper to recommend. It is no doubt one of great hypertrophy, with dilatation, and of course cannot be wholly cured.

Dr. Bright, who saw the patient in London, October, 1835, entertained a very unfavourable opinion of him, and, as he only saw him once, expressed his belief to a relative of mine that he must have died at his lodgings; he is, however, at this time better than he has been for the last three years, and there is every reason to hope that, by avoiding the influence of a cold atmosphere and stimulants, with the occasional use of the blue pill, he will continue in tolerable health for a long time to come.

Case II.—A lady, aged 53, of stout make, and somewhat disposed to corpulency, applied to me, Jan. 19th, 1836, with the following symptoms:—breathing short and somewhat difficult, especially on taking exercise, much increased by attempting to walk up hill, or on rising ground. The oppression of the chest is much aggravated by stooping; the head and shoulders require to be considerably elevated at night. She can only lie on the back; her pulse is moderate in frequency, and somewhat irregular: there is a slight tenderness between the cartilages of the ribs on the left side, and an unusually strong impulse produced by the systole of the left ventricle: there are no abnormal sounds.

The chest sounds well on percussion, respiratory murmur everywhere natural, bowels confined, urine scanty and high coloured, appetite bad, feet and ancles much swollen and œdematous, complexion sallow, and conjunctivæ slightly tinged with bile.

These symptoms have existed for many months, but not in their present intensity. The patient has been accustomed to live generously, and has used but little exercise. She was directed to take three grains of blue pill three times in a day, and to keep the bowels open with the pilula colocynth.

February 8th.—Gums tender, and the symptoms considerably relieved; ordered to continue the medicines.

18th.—The patient's complaint has nearly disappeared, and she is able to take walking exercise; urine sufficiently abundant, ancles not swollen.

June 23rd.—The patient has experienced a return of the difficulty of breathing, especially on using any exertion, and on stooping; the feet and ancles are again swollen, and the heart's action is preternaturally strong. She was ordered to return to the use of her medicine, which she took for a short time only, the complaint speedily giving way. In addition to the above treatment, the patient only took meat once in two days, and was interdicted the use of all fermented liquors.

The patient is at the present time, May 22nd, 1837, in tolerably good health, capable of walking a considerable distance, and no apparent cardiac affection exists, but she is much thinner than formerly, and has still a sallow and bilious tinge of countenance. There is reason to believe that be-

sides the cardiac disease the liver was not in a sound state at the time of my first seeing her, and it is probably still not in a perfectly natural condition; but I am unable to say whether the hepatic was the primary or secondary affection, or whether the two complaints were coeval.

Case III.—A lady, about 40 years of age, of middle stature, and leuco-phlegmatic countenance, with lips somewhat of a violet hue, and catamenia regular, came under my care, Sept. 3rd, 1835, complaining of shortness of breath, and palpitation, much increased by exercise, especially on walking up rising ground or ascending a staircase; feet and ancles swollen. She states that for many years she has been affected with difficulty of breathing and swelling of her feet, and an occasional bloated state of the countenance, and she was supposed by her medical attendants to be labouring under water in the chest.

On examining the chest by auscultation, it was found to be sufficiently sonorous except in the cardiac region, where the dullness was of greater extent than natural, and the respiratory murmur was perfect in every part.

The impulse produced by the heart's action was unusually strong, at times quite lifting the head of the examiner; the rythm and cardiac sounds were natural. She was directed to take one grain only of the pilula hydrargyri three times in a day. This small dose soon produced tenderness of the gums, and the usual mercurial fœtor of the breath. No sooner had this occurred, than the respiration was relieved, and the patient was enabled to take walking exercise. The

medicine was continued, with some interruption, until the 19th of November, at which time she felt better than she had been for many years previously, and during the following summer she enjoyed unusually good health. She is at the present time, May, 1837, a valetudinarian. I have not now seen her for a considerable time, but I am informed that she does not suffer from difficulty of breathing and palpitation as she formerly did.

Case iv.—A master shipbuilder, 70 years of age, tall and largely made, with colour and fair complexion, had enjoyed for the most part of his life good health, until January, 1835, when he suffered from debility, short breathing, and bronchial irritation. He complained somewhat of these symptoms till the end of March, when he became much better, and continued tolerably well until the 5th of August, at which time he was attacked with severe pericarditis, and possibly some degree of carditis.

The symptoms were, frequent and severe orthopnœa, rendering him unable to bear the recumbent position, or lie on either side, with great anxiety and desire for a constant supply of cold fresh air: this latter feeling was so urgent as to render it necessary for him to have a person constantly fanning him, and the windows open for some time, both night and day. There was also a feeling of faintness peculiarly distressing to the patient, and alarming to his friends; some degree of pain in the left shoulder and arm; and frequent, small, and irregular pulse: the surface of the body was often much colder than usual, and damp with perspiration; the urine, scanty and high coloured. The chest sounded well

on percussion, and the respiratory murmur was natural; the action of the heart was irregular, with an occasional strong heaving ventricular contraction; there were no abnormal sounds of the heart, and the natural ones were not heard beyond the cardiac region; there was tenderness between the ribs on the left side and under the ensiform cartilage.

Though the complaint yielded in a considerable degree to the usual treatment and the use of mercury, his life appeared to be in great danger during the month of August, but in September he became convalescent. Still there remained symptoms clearly indicating that inflammatory action of the pericardium in some degree existed. The patient was only able to lie on his right side for a very short period, and required his head and shoulders to be much raised. The pulse was quick, irregular, and small; and weak, when compared with the systole of the ventricles.

Towards the latter part of September, and during the month of October, he was able to walk out occasionally, and, when the weather admitted, he was in the habit, most days, of taking an airing in an open carriage; but he could not leave off medicine entirely during the remainder of the year.

His breathing frequently became difficult, and rendered him unequal to take his accustomed exercise, especially walking. Under these circumstances, he had recourse to the pilula hydrargyri, which very rarely failed in relieving him; indeed, the effect of the mercurial upon the gums in the slightest degree was uniformly the precursor of an

improved state of the respiration, and also of the general feelings of the patient. During the whole of the year 1836, unless confined by severe weather, he was generally able to go out, and his breathing has been kept tolerably easy, by the occasional employment of the blue pill, which at length he was in the habit of taking according to his own discretion. Notwithstanding this favourable condition of the patient, the progress of disease was not entirely stayed; the legs became slightly œdematous, and the abdomen somewhat larger than natural; he frequently complained of tenderness in the hypochondria, and there often appeared a bilious tinge in the conjunctivæ; the liver manifestly suffered at times from congestion and chronic inflammation.

Towards the end of Janaury, 1837, the anasarca of the lower extremities increased, and ascites was indicated by tension and obscure fluctuation in the abdomen, with a dull sound on percussion; but previously to this increased hydropic tendency, the patient had suffered from an attack of the epidemic influenza.

On the first of February he commenced taking elaterium: he took three or four doses of this medicine, at intervals of several days, with most marked benefit, and afterwards resumed the use of the small doses of the blue pill. In March, he again suffered from influenza. After this time until May it was necessary to confine the patient entirely to his house, in order to avoid the ill effects of the cold north-east winds, and not from any inability to go out; indeed, he was sufficiently well to leave off medicine during the month of April.

In the early part of May, it was discovered that the ascites was increasing, and the legs became more swollen; after taking three doses of the elaterium, he experienced great relief; both the ascites and anasarca were considerably diminished.

At this time (May 27th, 1837) he appears as well as he has been during the past year. He rides out several miles whenever the weather will allow of it, and is able to walk short distances with tolerable ease: his complexion is clearer, and his eyes decidedly less bilious than they have been for many months past, and his breathing is easy at all times except when taking walking exercise, and then the difficulty appears to arise as much from debility as from any other cause; his pulse is eighty in a minute, and more regular than it has been. The ventricular contraction of the heart is irregular, and stronger than natural, but the strength of the contraction is still not uniform. There is now a slight *bruit de soufflet,* synchronous with the contraction of the ventricles. The natural sounds of the heart are scarcely to be heard.

This case appears to be one of concentric hypertrophy* of the left ventricle, probably conjoined with ossification and diminution of the aortic orifice.

The patient continues to take the blue pill occasionally.

Case v.—A journeyman stone-mason, about 30 years of age, of short stature, was ill with acute rheumatism of the joints, in the months of April, July, and August, 1834. He got well under the ordinary treatment.

* *Traité Clinique des Maladies du Cœur, &c., par M. Bouillaud, tom.* 1.

In October, 1836, he was attacked with hæmoptysis, pain in the chest, cough, and difficulty of breathing, attended with fever. On examining the chest by auscultation, the chief phenomena observed were, a strong ventricular contraction and a loud bellows sound. In the beginning of this illness, he was twice bled from the arm, had a blister applied to the chest, and took calomel with antimony, colchicum, and ipecacuanha. At a later period he took the pilula hydrargyri with colchicum, digitalis, and squills. In November he was sufficiently recovered to be able to return to his work.

In March, 1837, he was attacked with pneumonia of the right lung, bronchial inflammation, and bronchial hæmorrhage. During the progress of the case, the right lung became hepatized to a considerable extent. On applying the stethoscope to the region of the heart, a *bruit de soufflet* was again discovered, and heard far more distinctly at the lower third of the sternum, and to the right of that bone, than in any other part, and in this situation a duller sound than natural was elicited by percussion. For this attack tartarized antimony was first prescribed, afterwards a similar treatment to that employed in October, 1836, was directed, under which most of his symptoms gave way ; but the prevalence of those atmospherical influences which made epidemic influenza so general in the spring of 1837, kept up bronchial irritation, and rendered it necessary to confine him to the house. His late severe illness and confinement have induced much debility; and, in addition to his other maladies, he has the misfortune to be affected with fistula in ano, but his health

is not yet sufficiently recovered to render it prudent to operate for that disease.

At the present time, May 29th, there is still cough, with some bronchial mucous secretion, but little difficulty of breathing; walking exercise can be taken easily, and the recumbent position is well borne. The *bruit de soufflet* is yet to be heard, and is loudest on the right margin of the lower third of the sternum; the ventricular impulse appears to be somewhat stronger than natural; the rythm of the heart is normal; the sound loud under both clavicles; the pulse one hundred in a minute, and weak when compared with the ventricular contractions.

There is perhaps in this case some degree of hypertrophy of both ventricles, but chiefly hypertrophy with dilatation of the right cavities; the bellows sound probably arises from regurgitation into the right auricle.

Case vi.—A gentleman, about 68 years of age, tall and stoutly made, with dark complexion, formerly a merchant, but latterly retired from business, became my patient March 26th, 1833, complaining of shortness and difficulty of breathing, especially when walking, and more particularly on ascending rising ground, or going up stairs; stooping also much distressed him. He had cough with sonorous rhonchus in the bronchi; the heart beat with unusual force; a strong bellows sound accompanied the contraction of the ventricles, which was loudest at the aortic orifice; respiratory murmur natural; pulse from seventy to eighty, with occasional slight intermission. The patient was bled from the arm, had a blister applied to the chest, and took aperient medicines.

On the 28th of March he commenced the use of the pilula hydrargyri, with squills and ipecacuanha, which he continued to take till the 22nd of April, when the gums became sore, and the breathing so far relieved, that he was able to take walking exercise, and he remained tolerably well till the beginning of October, 1834, a period of five months. In this interval he took a journey to London on business, and whilst there consulted Dr. Hodgkin, who told him that he laboured under enlargement of the heart, with disease of the valves, and obstruction of one of the orifices. At this time, (October, 1834,) the symptoms returned with considerable severity, when he had prescribed for him blue pill, squills, and colocynth. His legs were now œdematous, and the abdomen hard, but there was no sensible fluctuation; the urine was scanty and high coloured, and, by boiling, proved slightly albuminous.

About the 15th of October, 1834, distressing orthopnœa supervened, and he got but little rest; the dropsical symptoms were also much increased; at this time the use of elaterium was recommended by a gentleman who saw the patient with me in consultation. He took one or two doses of this medicine, but it affected him so much that he would not persevere in it. The pilula hydrargyri, with squills and colocynth, having produced no effect on the mouth by the 24th, he was ordered four grains of the blue pill alone, three times a day, and as a condition of the sensorium analogous to "delirium tremens" existed, we were under the necessity of giving him opiates at night. The gums soon became sore under the additional quantity of blue pill, and this,

as before, was followed with marked benefit to the breathing. The medicine was discontinued until the 3rd of January, 1835, when a recurrence of the symptoms brought him again under its use, and for a third time he experienced great advantage from its employment.

Towards the end of April it was ascertained that effusion had taken place into the right cavity of the pleura. From this period the anasarca of the lower limbs augmented, and an increased accumulation of fluid took place in the abdominal cavity. The patient died on the 17th of May.

This case is important as showing the striking advantage of the use of the pilula hydrargyri in organic disease of the heart far advanced. The bellows sound was permanent, and no doubt resulted from irremediable change of structure. Under these unpromising circumstances the patient obtained intervals of relief, one of five months, a second of two months, and a third of a period not well defined.

The examination of the body after death was not permitted.

ARTICLE VII.

TWO CASES OF GANGRENE OF THE LUNGS.

BY WILLIAM ENGLAND, M.D.

WISBECH;

Fellow of the Royal Medical and Chirurgical Society of London; late Physician to the Norwich Guardian's Dispensary.

James Mann, æt. 45, a chimney-sweeper, of a strong physical constitution, was, until the period of his illness, in the habit of obtaining an adequate maintenance by earning good wages. He had been accustomed of late to get drunk frequently with beer.* This intemperance was much increased by the depression arising from domestic circumstances, his wife, a woman of bad character, having deserted him during the last two months. August 31, 1835, he was seized with acute pain in the chest, and became a patient of the Dispensary. He was immediately bled from the arm, but the blood not flowing freely, only a small quantity was obtained. A blister was applied to the chest after the venæsection, and he was directed to take a mixture of tartarized antimony.

* Dr. W. Stokes, in his standard work on Diseases of the Chest, remarks that in all the cases of gangrene which he had seen, the patients were long addicted to the use of spirits.—p. 358.

From this treatment he is said to have derived much benefit: the pain of the chest, however, did not entirely subside. Cough came on two or three days after venæsection. His inability to sit up obliged him to take to his bed.

My absence from Norwich until the 16th of September, prevented my seeing this patient until that day, when I found him with the following symptoms—much muscular debility, incessant cough, copious expectoration of whitish muco-purulent matter, slight pain of chest, pulse quick, pretty firm, respiration somewhat more frequent than natural, skin warm and moist, little appetite, bowels regular.

Percussion.—The anterior and posterior regions of the left side of the chest sounded somewhat dull; the same regions of the right side were tolerably resonant.

Auscultation by the Stethoscope.—Mucous rattle over the whole of the right side of the chest; the vesicular respiration, however, distinctly audible. Respiration bronchial, anteriorly and posteriorly on the left side. On coughing, a cavernous resonance heard near the inferior angle of the left scapula; mucous rattle throughout the left lung louder than in the right; bronchophony audible near the centre of the left clavicle. Three table spoonsful of the following mixture were ordered every four hours:—℞ *Antim. tart.* gr. iv., *Træ Scillæ* ʒij., *Træ Hyoscyami* ʒiij, *Aquæ* ℥viiss. Weak meat broth.

Sept. 18th.—Much the same. *Repet. mistura. Applic. emplast. amplum Picis Burgund. thoraci.*

20th.—Several pints of greenish muco-purulent matter, of a gangrenous odour, expectorated within

the last twenty-four hours; the fœtor from his breath and expectoration renders his chamber almost intolerable; muscular debility increased. *Omitt. mist. Ant. tart.* To take four times a day three table spoonsful of the following mixture:—℞ *Quin. sulph.* gr. xii., *Acidi. sulph. dil* ʒj., *Træ Scillæ* ʒij., *Træ Hyoscy.* ʒiij., *Infusi. Rosæ* ℥viiss. To have *Ol. Ricini.* ℥ss.

23rd.—Expectoration of the same character has amounted to NINE pints in the last twenty-four hours; bowels open; cough still frequent; other symptoms the same.

27th.—Much the same. *Applic. emplast. vesicat. thoraci.* The blister to be dressed with *Cerat. Sabinæ. Perstet in usu medicam.*

Oct. 2nd.— *Cont. mist. tonica cum Quin. sulph.* ℈i. No improvement. Prostration of strength increased, and slight diarrhœa came on. He died Oct. 24th. During the whole progress of the case, there was complete absence of hæmoptysis. A *post mortem* examination was obtained with great difficulty. At length, assisted by Mr. Griffin, late surgeon to the Dispensary, I succeeded in obtaining an inspection of the thorax; the other cavities we were not permitted to inspect.

Sectio Cadaveris.—General appearance of the body much emaciated; thorax narrow in its transverse diameter; costal and pulmonary pleuræ on both sides adherent. *Right Lung.*—Surface of a cineritious colour; crepitates throughout the whole; gorged with sanguineous fluid without any fœtid odour *Left Lung.*—Upper surface of a bluish green colour; lower lobe posteriorly of a gangrenous green

aspect, resembling the plate in the third Livraison of Cruveilhier's Anatomie Pathologique; primary bronchus much dilated, and, together with the secondary ramifications, full of muco-purulent matter; the capillary vessels of the bronchial mucous membrane in a state of hyperæmia; miliary tubercles in the substance of the superior lobe; parenchyma of the lungs of a greenish colour, and gorged with sanguineo-purulent fluid; cavity capable of containing a small walnut in the substance of the inferior lobe near its posterior surface. This cavity was lined with an adventitious membrane of firm texture, and apparently of recent formation; the bronchus leading to the cavity was not dilated; all the bronchial glands much enlarged, and of a very dark red colour. *Heart.*—In a normal condition, excepting a slight osseous deposition on the semilunar valves of the aorta.

When the rarity of this pulmonary disease is universally acknowledged, it is rather singular that two cases should have come under my care in the course of six years, and that both of them should have occurred in the practice of the Dispensary. The more recent case has been just detailed. In the other, it was impossible to verify the accuracy of the diagnosis, the friends of the deceased not allowing a *post mortem* examination. The following, however, is an abstract of its history and progress:—

A bricklayer, of strong, indeed, robust form, of temperate habits, was attacked, during the summer of 1831, with continued fever, complicated with a very slight bronchitis. His cough, which was scarcely perceptible, soon disappeared, and convalescence

was perfect in less than a fortnight. Ten days afterwards when he was thinking of returning to his usual employment, he was suddenly seized with extreme prostration of strength and a violent fit of coughing, during which he expectorated two or three pints of yellowish green matter, of an intense fœtidity. The peculiar character of the sputa remained the same, and the prostration of strength increased with a rapidity unusually rare in an individual of such apparently strong constitution. Every effort, by means of tonics and nutritious diet, to restore the vital powers, was unsuccessful, and the man died in about three weeks from the commencement of these symptoms. During the previous attack of fever, the respiratory murmur throughout the lungs was daily heard, and the mucous rattle was not more developed than is usually found in the slight intercurrent bronchial irritation complicating the majority of cases of continued fever.

A case of circumscribed pulmonary gangrene occurred during my attendance upon the clinique of M. Laennec, in the summer of 1825: and another case I witnessed at the Meath Hospital, under the care of that accomplished stethoscopist, Dr. William Stokes. The last happened in the winter of 1827.

No well authenticated notice of this disease is to be met with in ancient authors; nor could we expect it to be otherwise, since the diagnosis of disease was mere guess-work, until practical medicine was founded on the basis of morbid anatomy.

Morgagni,* relates a case of sphacelus of the right lung, in the superior part of which was an abscess.

* Epistle xx, art. 41.

The symptoms were, pain on the right side, cough, slight expectoration, respiration rather difficult, great prostration of strength.

Fœtid sputa are generally deemed a bad omen. Van-Swieten, in his Commentaries,* mentions a young man who coughed up every morning sputa so extremely fœtid, as to be almost intolerable This state of the expectoration continued for two years, during which period he daily followed his usual occupations. The quantity of the sputa having suddenly increased, he sunk after going into a state of rapid emaciation.

J. P. Frank, Pinel, and Hildebrand, make no allusion to *gangræna pulmonum* being either idiopathic or a sequela of pneumonia. Laennec believes pulmonary gangrene in the circumscribed form to be one of the most rare organic affections; and his distinguished translator, Dr. Forbes,† says in a note, "Gangrene of the lungs is an extremely rare disease: I do not think that I ever met with a case in practice, and certainly never witnessed the lesion in the dead body: *I do not know where to refer to any case recorded in our medical literature,* the nature of which was unequivocal. Dr. Tweedie, in his article inflammation, in the *Cyclopædia of Practical Medicine,* says "the termination of inflammation of the lungs in gangrene is exceedingly rare, and when it is met with, it is not always to be regarded as an indication of the pneumonia, as it has been found in cases where the symptoms as well as the appearances of inflammation were very slight and equivocal."

* Tome iii, page 72.

† Second edition, 1827.

Dr. William Stokes* says, in his clinical lectures, that spontaneous gangrene, or that which occurs independent of inflammation, does not occur in the cavities of the body.

That fœtidity of the sputa is not, *per se*, a sufficient indication of grangrene of the lungs, is proved by the following cases :—Andral† mentions a man, aged 43, who continued to expectorate sputa, of an extreme fœtidity, during a fortnight : their odour then became less offensive, and they subsequently returned to the inodorous character of simple bronchitis. This man was liable to catarrh, and whenever it became aggravated the sputa assumed a fœtid character. This patient left the hospital and resumed his usual occupations, though he still coughed, and the posterior part of the left side of the thorax preserved the dull sound, with an obscurity in the respiratory murmur, which, mixed with mucous rattle, had been the chief character of the case during its whole progress. Andral has likewise given two other cases, one of which‡ recovered or left the hospital in a satisfactory state; the other§ terminated fatally ; they are well deserving an attentive perusal.

Laennec divides pulmonary grangrene into two forms, the diffused, and the circumscribed. Cruveilhier‖ advances a contrary opinion : he observes "*Je ne vois pas d'ailleurs qu'il existe de difference*

* *Ryan's Medical and Surgical Journal.*

† *Clinique Medicale, tome ii, obs.* 8*me*, second edition.

‡ *Idem*, p. 154.

§ *Tome i, observ.* 13*me.*

‖ *Anatomie Pathologique Livraison*, 11*me.*

fondamentale entre ces deux formes de gangrène, l'une et l'autre reconnoisent les mèmes causes ; elles sont egalement refractaires à nos moyens therapeutiques et sont presque necessairement mortelles." Reason leads me to accord in this general opinion of Cruveilhier. The termination of pleuro-pneumonia in gangrene is minutely detailed by Andral.*

The case of my patient Mann, was evidently analogous to those mentioned by Andral, as well in its cause, as in the progress and necroscopic appearances. With regard to the latter, in Mann's case, the gangrenous cavity was seated in the inferior lobe of the left lung, not far from its posterior surface ; in Andral's 63rd observation, it was in the lower lobe of the right lung, near its posterior surface ; in the 64th in the middle lobe, not far from its surface ; and in the 65th an immense cavity was found to occupy the whole extent of the lung. In Cruveilhier's beautiful plates, the cavities are represented in a similar site to Mann's, in the right lung.

In our prognosis of this intractable disease, the above well authenticated fact,—that the gangrenous fœtidity of the sputa may disappear after a longer or shorter duration, may lead us to look for a favourable issue, provided the mucous membrane of the bronchi is the chief source of the expectoration, and an extreme prostration of strength should not be present.

The non-inspection of the body of my other patient is the more to be regretted, since the total absence of the auscultatory symptoms which infallibly denote the existence of pneumonia, would lead me

* *Clinique Medicale, obs.* 63*me*, 64*me*, *et* 65*me*.

to infer that this was probably a case, if such there be, of idiopathic gangrene, independent of inflammation.

In concluding my remarks on this very rare pulmonary affection, the just views of Andral in his 13th observation should not be lost sight of. "*La grande fœtiditè des crachats peut donc quelquefois appartenir à une simple sécrétion de la muqueuse bronchique. Leur extreme liquidité, leur ecoulement en une nappe uniforme n'indiquent donc pas constamment l'existence d'une cavité de la pleure ou des poumons, dont les parois secretent du pus. D'ailleurs cette expectoration avoit lieu depuis plusieurs années; et si elle avoit eu sa source ailleurs que dans les bronches, la mort eût été plus prompte.*"

ARTICLE VIII.

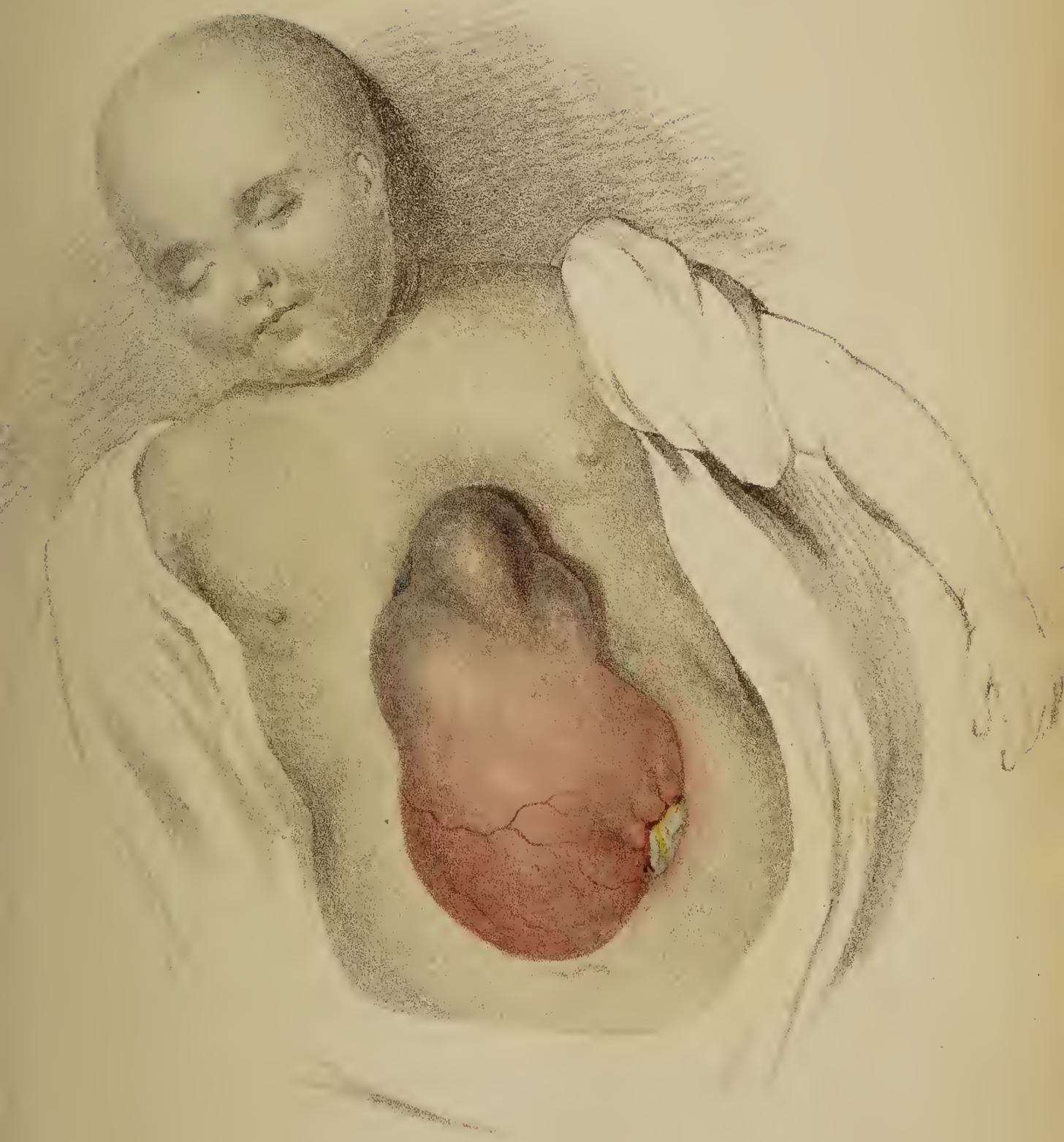
A CASE OF PARTIAL ECTOPIA CORDIS AND UMBILICAL HERNIA.

BY JOHN O'BRYEN, M.D.,

Bristol.

FEMALE child of Charles M'Carthy, æt. fourteen days, 20th July, 1837, residing at No. 5, St. James' Back, Bristol: the father and mother both under 30 years of age, and healthy. The latter states that on Christmas eve last she slipped in the street, and fell against the curb stone; the ensiform cartilage and neighbouring parts coming into contact with the stone, deprived her of breath and the power of utterance, the effects of which she felt for some weeks, but did not then know she was pregnant, the third month not having been completed. She was confined July 6th, of a female child, after a natural labour.

State of the Infant fourteen days after Birth.—She is healthy, large, and was born at full term; colour of the face and skin perfectly natural; she takes the breast well, and sleeps quietly, with the exception of an occasional start. The secretions and excre-



Dr O'Bryen's Case of Ectopia Cordis.

London Published by John Churchill Princes St Soho.

Fairland Lithog

tions are normal. The head is raised from the chest at each systole of the heart, which occurs 140 times per minute; inspirations 45 per minute whilst the little patient is asleep; the dyspnœa is much lessened when she lies on her back with her head on a level with her body. The shape and outward form of the thorax is perfect, with the exception of the greater part, if not the whole, of the ensiform cartilage, which is wanting. The functions of the cerebro-spinal system apparently normal.

At the anterior and superior part of the abdomen, between where the umbilicus and the lower end of the sternum ought to be, exists a tumour, soft, oval, unequal, and semi-transparent, three inches and a half in length, two and a quarter in breadth, and one and a half (at a medium) above the level of the parietes. The inferior three quarters of this tumour is evidently occupied by the floating viscera, which have escaped for want of the support of the linea alba, and of the oblique, the transverse and recti muscles, the superior portion only of the last being I think wanting. The skin covering this inferior section of the tumour is reddish and shining, being evidently of late formation; on the left side of it is an ulceration about the size of a half-crown, where the cord was inserted. Around the base of the tumour, particularly the superior portion, where the integuments of the body meet those of the hernia, there is a raphe, which, with the appearance of the skin, shows that the abdominal cavity remained open to a late period of utero-gestation.

The superior quarter of the tumour has a triangular shape, bounded laterally by the cartilages of

the false ribs, and inferiorly by what appears to be the transverse colon. In this triangle, which is exactly in the median line, is seen through the diaphanous skin, a body pulsating in shape and appearance not unlike a small heart, with its point directed outwards, thus forming nearly a right angle with the sternum, its apex being pushed upwards by the distended colon ; but when the intestines are not so distended, the angle becomes a very obtuse one.

The blood-vessels ramifying on this body were easily recognised through the delicate and almost transparent skin, which became injected and of a dusky tinge whenever the infant forced down or retained her breath. Three distinct motions or actions were evident, I believe, to almost every person who examined the tumour, and they were not a few, and amongst them Dr. Charles Williams of London.

First.—A lessening in size or a contracting of its whole body one hundred and forty times per minute, during which a dimple was formed on its side, varying in depth according as it emptied itself of the whole or only a part of its contents ; the depth was always increased when the infant took a deep inspiration and was very quiet, as in sleep. This contracting or systole commenced suddenly, and diminished considerably the size of the body ; after repeated observation, and the most attentive examination, this first motion appeared to be synchronous with the pulse in the carotid, and with the first or ventricular sound.

Second movement,—or that of dilatation, during

which its body became tense, and appeared shortened, while, at the same time, it was much enlarged by as active a force as that of contraction, (it was dilated even when, by PRESSURE, we attempted to prevent it;) whilst in the fingers, it gave me, as well as many of my medical brethren a sensation as if it were first *forcibly* enlarged, and that then a fluid rushed in, with one wave, communicating the feeling of a thrill. The dilatation was synchronous with the second or loud *sound*, but it appeared *to continue after it.*

During the systole, the third or downward movement of the whole tumour was observed to take place, (it certainly commenced rather before than after the systole,) evidently distinct from that caused by irregular periods, by the contraction of the diaphragm, as well as by deep inspiration. To make this motion more evident, I pushed the pulsating body into the thorax, where it required a considerable force to retain it, as *during each* systole it was forced down against my fingers, pushing them forwards, and this with a more equal power each time, when the pulse was regular and full, than when it beat one strong, followed by two or three small pulsations; the same was observed to take place in the tumour, and I think this is easily explained, by supposing that the ventricle emptied itself during the first, and only partially *during the three* succeeding pulsations.

From the loud noise, or that caused by the reaction of the arteries on the blood expanding the semilunar valve, to *the duller* or that called ventricular, the space of time appeared to be about one

half of the whole time of the heart's action, if any thing, rather more, as observed by the eye, but the movements were so quick that I shall not attempt to advance anything positively as to the exact quantity of time occupied by each motion separately; the period of rest was all but imperceptible, indeed it appeared inseparable from the dilating, but more especially the filling of the ventricles, or that period when the thrill was felt.

Taking the tumour in the fingers of one hand, and passing those of the other under and behind it, they came into contact with a large round body within the thorax, (the skin was so lax, it permitted this to be done with facility,) whose pulsations were synchronous with those of the tumour. This same body was also felt in front, and might have been mistaken for the pulmonary artery.

Handling the tumour, or touching the body within the thorax, did not appear to give rise to the slightest sensation on the part of the little patient, in this agreeing with the case of the celebrated Harvey. There was eivdently no hernia of the abdominal viscera *into the thorax*, and *vice versa* : nor, on the other hand, was there any hernia of the thoracic viscera into the abdomen.

The chest sounded well, being clear over that spot where the impulse is generally felt, but I was prevented by circumstances, viz., the age, the dyspnœa, &c., from deriving more accurate information from this source of diagnosis. The respiration was natural for an infant, and evident in the precordial region, showing that a portion of lung occupied that region. The sounds of the heart

were clear and distinct, in the precordia rather anteriorly; but they were evident over the whole thorax, accompanied by *no impulse,* or any abnormal noise.

In the lower portion of the abdominal tumour, which became much distended whenever the child cried or forced downwards, the vermicular action of the small intestines was very distinct.

Sept. 28th.—The pulsating body has increased in size, and the skin covering the tumour is quite white, the ulceration entirely healed, the patient has had one convulsion.

Oct. 1st.—The infant has taken cold, and become much emaciated the two last days. Convulsions occur more frequently to-day, pulse not to be counted, respiration increased to 53 per minute, a general mucous rattle over the chest; the colour of the face remains unchanged, though expressive of great anxiety.

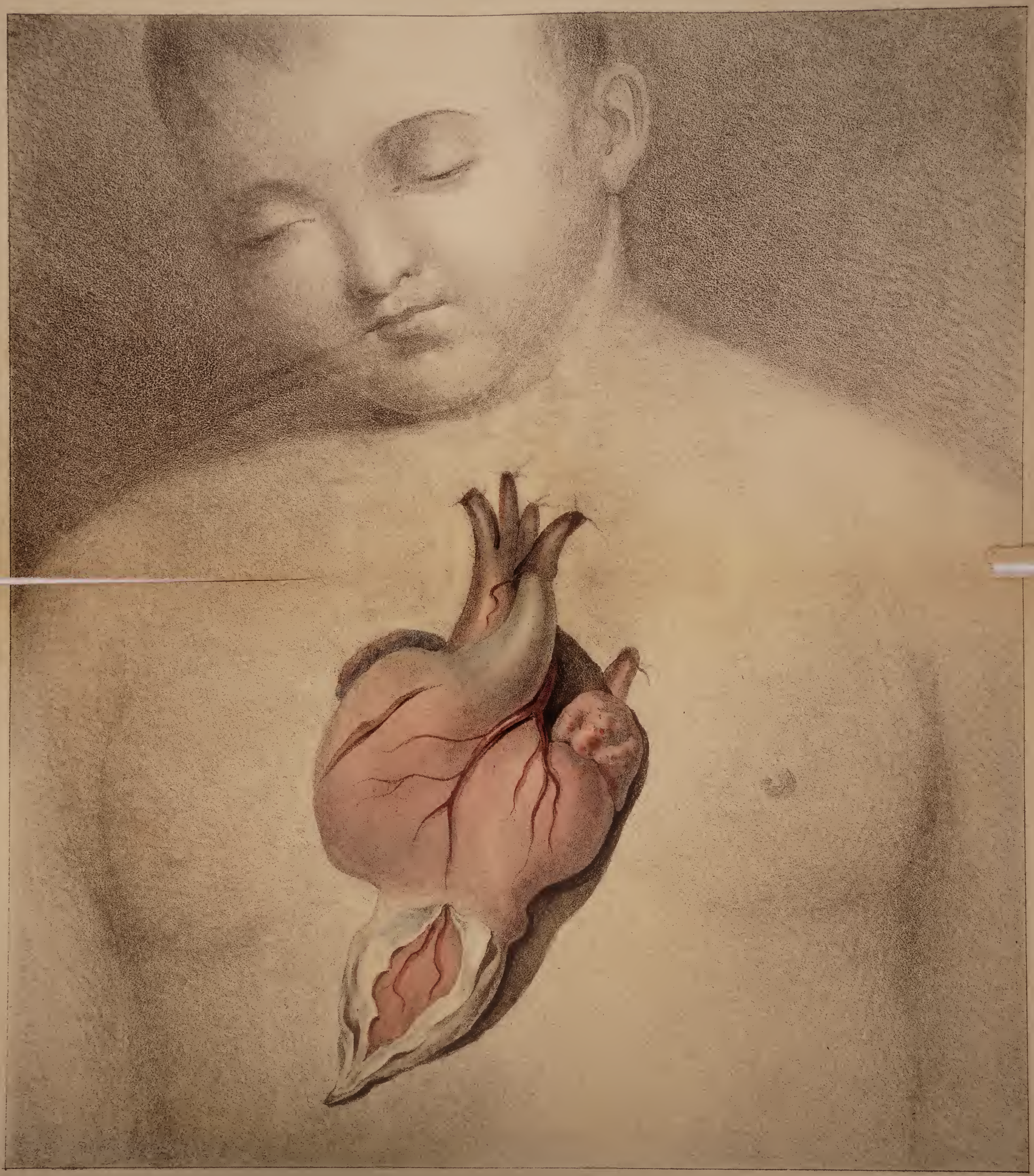
Oct. 5th.—The lips have become slightly blue, she is apparently sinking, has had two convulsions to-day, and vomited some matter streaked with florid blood. She died a few hours after without a struggle, being then three months old.

Post-mortem examination two days after death.—The face was pale and placid; there was no injection of the venous system, not even of the lips; the limbs were much emaciated and not rigid. The abdomen presented the tumour before described, having a cicatrix on the left side of it, which had been the seat of the ulceration caused by the sloughing of the cord.

The head was not opened, permission not being

given. An incision was made through the skin from the top of the sternum to the pubes; while dissecting back the skin, not a trace of a muscular fibre could be discovered over the superior part of the tumour, neither the recti, the oblique or transversalis muscles, nor the linea alba. The transverse colon appeared the instant the skin was divided, forming the base of the triangle described in the history of the case; the cartilages of the ribs were perfect; the sternum was perhaps a little shorter than natural, and the ensiform cartilage was entirely wanting. The liver was very large even for an infant three months old, extending quite across the abdomen; with this exception, all below the diaphragm was normal. This muscle was itself normal, with the exception of the band or bundle of muscular fibres which attaches it to the ensiform cartilage. Its usual attachment to the posterior face of the cartilages of the false ribs continued, as is natural, but the ensiform cartilage being absent, it passed from one cartilage to the opposite one without its proper support in this place. The consequence of this was, that a triangular opening, formed laterally by the cartilages, and inferiorly by the fallen and floating portion of the diaphragm, remained, close to that spot where the pericardium adheres to that muscle, and to the anterior mediastinum in front.

The sternum being now raised, we discovered the heart in the pericardium nearly in its natural position, rather towards the right, its base occupying the left side of the thorax, and overlapped by the lung. The right ventricle was hypertrophied, being double the thickness of the left, with some dilata-



Dr O Brien's Case of Ectopia Cordis

tion, and its apex was directed to the right side. The left was of its ordinary thickness, lying from left to right, and prolonged for about one inch and three quarters, into a sack formed of the pericardium, which with the sack protruded through the triangle above described, the prolonged portion forming, when in place, an obtuse angle with the remainder of the ventricle. The apex of the right ventricle prevented the left coming further out. When we opened the pericardium, we observed that it was attached by old adhesions to the protruded portion of the ventricle. The anatomical formation of the heart was normal;* the blood was fluid, and the heart contained no clot. The substance of the lungs was healthy and well inflated, and the hypertrophy of the right ventricle explained the congestion of the bronchial mucuous membrane as well as the expectorations of fluid blood.

* The exact measurement of the heart, not injected, but simply filled with fluid:—

	Inches.	Lines.
Length of the left ventricle from its base or union with the left auricle to its apex	3 ...	3
Thickness of the walls of left ventricle.....	0 ...	$1\frac{1}{2}$
Length of prolonged portion	1 ...	9
Diameter of ditto; ditto taken internally at the strictured part.....	1 ...	0
Diameter of the widest part of left ventricle, internally.....	1 ...	$1\frac{1}{2}$
Length of the right ventricle from insertion of pulmonary artery to its apex	1 ...	10
Thickness of the walls of right ventricle	0 ...	3
Diameter of right ventricle, internally	1 ...	6
Circumference of the ventricles	7 less	1 line.
Circumference of auricles	7 less	2 lines.
Circumference of prolonged portion of left ventricle	4 ...	$1\frac{1}{4}$

The history of medicine does not, to my knowledge, furnish a parallel case—one in which the isolated action of a great part of the left ventricle is presented to the observation of three senses—vision, tact, and hearing. It appears to me that the following conclusions may be drawn from this very interesting observation :—

1st. It seems probable that the prolongation of the left ventricle was caused in consequence of the pre-existence of the triangular opening, as the action of the heart continually tended to force it against and through the aperture, and that the adhesions retained it there ; perhaps the first link in the chain of causation might have been the arrest of developement of the ensiform cartilage, and of all the muscular *fibres* usually attached to it.

It is a principle in physics, that when one body is struck by another, an impulse is communicated to each in a direction from the tangent according to the angle of incidence ; if the impulse be in a right line, there is a recoil of the impelling power in the opposite direction, and if a body be struck by two equal forces in directions equally oblique, the direction of the impulse will be intermediate. Keeping this fixed principle in view, I conclude :—

2ndly, That in the production of the impulse, no account has hitherto been taken of the downward motion spoken of above (I am aware a sliding motion has been described), produced, as I believe it to be, by two causes. The first of these is the sudden rush of blood from the distended auricle into the dilated ventricle sufficient to fill it, which must produce some degree of downward impulse to the

heart; but if M. Bouillaud's opinion of the injecting powers of the auricles be correct, then it must be of some amount. The second is the recoil or rebounding force of the heart when the ventricles have driven a column of blood into the aorta and pulmonary artery. Unite these two forces, and I believe they tend to increase, if not partly to produce, the impulse.

Let us see if pathology does not bear out this view. When the ventriculo-arterial orifices are obstructed, or when there is hypertrophy, either eccentric or concentric, the impulse is increased in proportion to the obstruction and to the power of the muscle, the rebound being equal to the force exerted by the ventricles to expel the column of blood. Does not this solve the question of increased impulse; and that, too, in proportion to the disease? The received opinion of the present day is, that the impulse is caused simply by the systole straightening the anterior convexity of the ventricles, and thus bringing the apex into forcible contact with the ribs. It seems to me, if to this be added the above two forces, the impulse, or rather its cause, would be better explained. Perhaps also the *direction* in which these forces act might still more *perfectly* explain it.

3rdly, That dilatation of the ventricles is as active a force as the contraction. Dr. Copeland supported this opinion many years since, and still, I believe, adheres to it.

4thly, That the dilatation is the cause of the gush of blood from the auricles, not its effect; that acting, as in this case it appeared to do, upon the

principle of the common pump, it tended to carry on and explain the circulation in the large veins and through their valves, to extend the effect of the same principle to their minute divisions. Hamberger and Dr. Copeland fully concur in the first part of the above conclusion, and M. Bouillaud's opinion nearly agrees with this inference, only that he attributes an injecting power to the auricles.

5thly, That no sound was produced by the contraction of that portion of the left ventricle, isolated as it was from the remainder of the heart, the sounds appearing to proceed from the neighbourhood of the valves. I merely here state what were the ideas excited in me and in many of my medical brethren who saw the little patient, after very frequent and most attentive examination. This conclusion is, I know, in contradiction to that come to by the Committee of the British Association, who decided that the first sound is caused by the muscular attraction of the ventricles. If this were the case, is it not probable that this isolated portion of the ventricle would have caused some sound? When taken in the fingers, and even held alternately under the stethoscope, and to the ear, a transmitted sound was heard, but no direct one, except that caused by the friction of the body against the instrument.

ARTICLE IX.

EXTIRPATION OF THE EYE,

ON ACCOUNT OF

A TUMOUR DEVELOPED WITHIN THE OPTIC SHEATH.

BY R. MIDDLEMORE, ESQ.,

Surgeon to the Birmingham Eye Infirmary.

— Hands, æt. 3, a very healthy-looking child, was brought to me at the Eye Infirmary, in consequence of a slight strabismus, presumed loss of sight and fulness of the left eye, which had been first noticed by his parents two months ago.

State of the Eye.—The cornea is slightly nebulous, the eye a little more protruded than its fellow, and it is evident that the power of sight is entirely lost. The parents and brothers and sisters of the child are very healthy. The defect of the eye cannot be traced to a fall or blow, or to any accident or circumstance of any kind.

Progress of the case.—In the course of three months, the eye-ball became considerably protruded and much inflamed, and the whole cornea assumed a decidedly nebulous appearance. The iris was pushed towards the cornea, but was not distinctly inflamed. The pupil was slightly muddy, but there was no deep-seated shining opacity at its fundus,

nor did the eye itself appear to be much enlarged. A degree of fulness at the upper and outer side of the eye-ball may be perceived on close examination when the palpebræ are widely separated. The child is very restless, and is manifestly suffering some degree of pain. It was evident that the performance of an operation constituted the only feasible means of relief.

Operation.—Mar. 18, 1837: present, Mr. Hodgson, Mr. Ledsam, and Mr. Crompton. Having lengthened the intertarsal slit by an incision towards the temple, discharged the humours of the eye, passed a strong ligature through the sclerotica a little behind the margin of the cornea on each side, and, by its agency, drawn the eye forwards and upwards, I made a pretty deep semicircular incision through the conjunctiva, and somewhat beneath the globe, from the inner to the outer canthus, and united the extremities of this incision by a similar one made at the upper part of the eye-ball. The tumour was of considerable size and extended, as I imagine, through the optic foramen, so that it was not perhaps wholly removed. However, with the curved scissors, I succeeded in clearing the orbit. The soft and slippery character of the tumour, and the depth and situation of that small portion which, I think, remained, rendered it somewhat difficult and dangerous to continue my attempts to extirpate every portion in the situation of the optic foramen. On the completion of the operation, the little patient was extremely exhausted from loss of blood, and required the use of pretty active stimulants for at least an hour afterwards. The orbit was now

carefully sponged, a thin fold of linen dipped in cold water was lightly bound upon the eye-lids, and the patient put to bed.

On the following morning the lids were a little swollen, and, on the next day, they were excessively tumid; this, however, subsided in the course of a few days. The orbit discharged a good deal of pus for three weeks, and, when this ceased, as the child had apparently perfectly recovered, I ceased to attend it. Since this period, I have occasionally seen the little patient, and with a view of completing my notes of the case, called and examined him to-day (Feb. 28, 1838). The orbit appears free from disease; the eye-lids are quite healthy, and are slightly drawn inwards by the absence of the eye-ball. The *right* eye has a rotary motion, but vision is perfect. The intellect is unimpaired; but the power of the right (the left eye, it will be remembered, was removed) hand and arm is diminished, and the child drags the right foot slightly, very slightly, along the ground when walking or running.

Dissection of the contents of the orbit immediately after their removal.—The eye-ball appeared healthy, except that its humours were slightly turbid, the cornea somewhat opaque, and its back part near the optic nerve slightly indented by the pressure of the tumour. The optic sheath was a little thickened and much dilated by the large tumour, and especially so near the optic foramen. A portion of cellular matter, apparently the cellular membrane formerly connecting together the fibrillæ of the optic nerve, was observed between the

tumour and the optic sheath ; this was of a yellowish colour, most abundant near the cribriform portion of the sclerotic coat, and condensed into one or more layers in those situations where, from the greater size of the tumour, &c., it would be exposed to the greatest degree of pressure. The tumour, covered by this cellular tissue, and by the sheath of the optic nerve, was of considerable size ; its greatest bulk being situated near, but not close to, the optic foramen. It was of a yellowish colour, and of a texture resembling the mucilaginous nasal polypus, only rather fibrous. By immersion in spirit, it assumed a firm, fibrous, and whitish appearance. The preparation is added to my pathological collection, which I shall have real pleasure in shewing to any member of the profession who may wish to examine it.

Section of the Eye-ball, Optic Sheath, and Tumour.

1.—The optic sheath.
2.—The connexion of the optic sheath with the sclerotica.
3.—The tumour.
4.—The unabsorbed cellular membrane of the optic nerve.

PART IV.

REPORTS OF INFIRMARIES AND DISPENSARIES.

ARTICLE X.

A REPORT OF THE OUT-PATIENTS

ATTENDED

BY F. RYLAND, ESQ.,

AT

THE BIRMINGHAM TOWN INFIRMARY,

Between the 25th Dec., 1835, *and the 25th Dec.*, 1836.

Table 1.

	Qr. ending March 25.		Qr. ending June 24.		Qr. ending Sep. 29.		Qr. ending Dec. 25.		TOTAL.	
	CASES	DTHS.	CASES	DTHS.	CASES	DTHS.	CASES	DTHS.	CASES	DTHS.
Abortion	...	...	...	...	...	...	1	...	1	...
Abscess	14	...	13	...	12	...	8	...	47	...
Amenorrhœa	4	...	5	...	2	...	1	...	12	...
Anasarca	8	...	7	...	4	...	4	2	23	2
Aphthæ	1	...	4	...	5	...	1	...	11	...
Bronchitis	84	4	32	...	24	1	27	...	167	5
..... chronic...	45	1	32	3	10	...	15	1	102	5
Burns and scalds...	12	2	4	...	2	...	1	...	19	2
Carcinoma mammæ	...	...	...	...	2	1	...	...	2	1
Cephalalgia	7	...	4	...	11	...	2	...	24	...
Chlorosis	...	...	...	...	1	...	...	...	1	...
Cholera biliosa ...	...	...	2	...	...	...	...	...	2	...
Chorea	...	...	1	...	...	...	...	...	1	...
Colica pictonum ...	...	...	...	...	2	...	...	...	2	...
Constipation	18	...	18	...	11	...	3	...	50	...
Convulsions	4	3	4	2	4	...	...	...	12	5
Cutaneous diseases	21	...	11	...	9	...	12	...	53	...
Cynanche tonsil...	14	...	8	...	12	...	5	...	39	...
..... trachealis	2	1	1	...	2	2	...	...	5	3
Deformity	...	...	2	...	1	...	...	...	3	...
Dentition	1	...	2	...	...	...	...	...	3	...
Diarrhœa	16	1	15	...	30	...	12	...	73	1
Diseases of bones ..	2	...	3	...	1	...	..	...	6	...
..... eyes ...	3	...	7	...	5	...	1	...	16	...
..... joints ..	2	...	4	...	1	...	1	...	8	...
Disordered bowels.	4	...	6	...	1	...	3	...	14	...
Dysentery	4	...	4	...	6	2	3	...	17	2
Dysmenorrhœa ...	3	...	1	...	...	...	...	...	4	...
Dyspepsia	29	...	42	...	40	...	20	...	131	...
Dysuria	2	...	2	...	...	...	...	...	4	...
Epilepsy	1	...	3	...	...	...	1	...	5	...
Epistaxis	...	...	...	...	1	..	...	...	1	...
Erysipelas	3	...	3	...	6	1	2	...	14	1
Erythema	2	...	1	...	5	...	...	...	8	...
Fistula in ano	1	...	...	...	...	...	1	...	2	...
Fractures	1	...	2	...	...	...	...	...	3	...
Fungus hæmatodes	...	...	1	1	1	1	...	...	2	2
Gastritis chronic...	16	...	9	...	6	...	3	...	34	...
Gonorrhœa	10	...	4	...	4	...	3	...	21	...

	Qr. ending March 25.		Qr. ending June 24.		Qr. ending Sept. 29.		Qr. ending Dec. 25.		TOTAL.	
	CASES	DTHS.	CASES	DTHS.	CASES	DTHS.	CASES	DTHS.	CASES	DTHS.
Gravel	2	...	3	...	3	...	...	...	8	...
Hæmatemesis	2	...	1	...	1	...	2	...	6	...
Hæmoptysis	2	...	6	...	1	...	...	...	9	...
Hæmorrhoids	2	...	3	...	1	...	1	...	7	...
Hemicrania	2	...	5	...	6	...	...	...	13	...
Hepatitis chronic	1	...	...	...	...	...	...	...	1	...
Hernia	5	...	2	...	3	...	1	...	11	...
..... strangulat.	1	...	...	...	1	1	...	...	2	1
..... humoralis	1	...	1	...	2	...	...	...	4	...
Herpes Zoster	1	...	...	...	...	...	1	...	2	...
Hypertrop. of heart	1	...	...	...	...	...	...	...	1	...
Hysteria	5	...	1	...	5	...	1	...	12	...
Hydrocele	...	...	1	...	...	..	...	...	1	...
Icterus	2	...	3	...	3	...	1	1	9	1
Laryngitis, œdem.	...	...	...	...	...	...	1	. .	1	...
..... chronic	3	1	2	...	1	...	...	...	6	1
Leucorrhœa	2	...	...	...	3	...	...	...	5	...
Lumbago	12	...	5	...	6	...	3	...	26	...
Mania	2	...	6	1	4	...	4	...	16	1
Menorrhagia	4	...	6	...	3	...	1	...	14	..
Paralysis	5	1	5	...	2	...	2	1	14	2
Parotiditis	...	...	1	...	1	...	...	...	2	...
Pericarditis, rheum.	...	...	...	...	1	1	...	...	1	1
Peritonitis	2	1	3	...	1	...	1	1	7	2
..... chronic	3	2	1	1	...	...	...	...	4	3
..... puerperal	...	...	...	...	1	...	3	...	4	...
Pertussis	24	3	16	2	1	...	...	...	41	5
Phlegmasia dolens	3	...	...	...	...	...	...	...	3	...
Phlogosis	6	...	12	...	11	...	3	...	32	...
Phthisis	7	5	6	6	4	3	3	2	20	16
Pleuritis	5	1	2	...	1	...	3	1	11	2
Pleurodynia	4	...	15	...	12	...	3	...	34	...
Pneumonia	5	1	1	1	2	...	2	2	10	4
Podagra	2	...	1	...	2	...	...	...	5	...
Prolapsus uteri	1	...	4	...	1	...	...	...	6	...
Pudendal disch. in children	1	...	1	...	...	...	...	...	2	...
Purpura	1	1	1	...	...	...	...	...	2	1
Rheumatism	29	...	23	...	18	...	22	...	92	...
..... chronic	4	...	6	...	5	...	1	...	16	...
Rubeola	28	5	61	9	17	5	...	...	106	19
Scarlatina	25	6	10	1	3	1	...	...	38	8
Scrofula	4	...	5	...	4	...	1	...	14	...
Stricture of urethra	...	...	1	...	...	...	1	...	2	...
Synochus	27	3	31	2	43	2	20	3	121	10
Syphilis	3	...	12	...	7	...	3	...	25	...
Tumor	1	...	...	...	...	...	...	...	1	...
Ulcers	14	...	21	...	14	...	4	...	53	...
Urticaria	1	...	3	...	1	...	...	...	5	...
Varicella	...	...	...	...	1	...	...	...	1	...
Varices	...	...	2	...	...	...	1	...	3	...
Variola	27	4	6	1	13	1	5	...	51	6
..... after vacc.	4	...	...	...	...	...	...	...	4	...
Worms, intestinal	6	...	6	...	5	...	3	...	20	...
Wounds, contusions, &c.	32	...	20	...	27	...	7	...	86	...
Total	658	46	578	30	462	22	234	14	1932	112

TABLE 2.—*Shewing the sex and age of the patients affected with the different diseases.*

	Under 2 years.		Between 2 and 5.		Between 5 and 10.		Between 10 and 20.		Between 20 and 30.		Between 30 and 40.		Between 40 and 50.		Between 50 and 60.		Between 60 and 70.		Between 70 and 80.		Between 80 and 90.		Total.		Total Cases.
	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Male	Fem.	
Abortion	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Abscess	3	0	2	1	4	3	0	5	7	4	1	5	1	2	5	2	0	2	0	0	0	0	23	24	47
Amenorrhœa	0	0	0	0	0	0	0	7	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	12	12
Anasarca	2	0	0	1	1	0	2	0	2	1	0	1	2	5	1	1	0	4	0	0	0	0	10	13	23
Aphthæ	1	6	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10	11
Bronchitis	8	13	12	13	8	11	7	9	8	13	4	16	10	11	6	5	5	3	1	4	0	0	69	98	167
..... chronic...	0	0	0	0	0	0	0	0	1	3	4	8	14	11	15	11	12	12	2	9	0	0	48	54	102
Burns and scalds...	0	1	1	2	2	1	1	0	1	2	2	1	4	1	0	0	0	0	0	0	0	0	11	8	19
Carcinoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
Cephalalgia	0	0	0	0	0	0	2	2	0	3	3	4	2	4	0	3	0	1	0	0	0	0	7	17	24
Chlorosis	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Cholera biliosa ...	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Chorea	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Colica pictonum ...	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	2
Constipation	1	0	0	0	0	2	3	8	0	13	2	3	1	6	2	2	0	2	1	3	1	0	11	39	50
Convulsions	3	4	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	8	12
Cutaneous diseases	5	3	1	8	6	5	4	1	2	3	1	4	1	1	0	0	0	1	0	0	0	0	20	33	53
Cynanche tonsil. ...	0	0	0	0	1	0	3	11	6	6	2	4	0	3	0	2	0	0	1	0	0	0	13	26	39
..... trachealis	1	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	5
Deformity	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3
Detention	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3
Diarrhœa	3	9	10	3	3	1	3	3	3	4	2	5	0	2	4	10	2	4	1	1	0	0	31	42	73

	Under 2 years.		Between 2 and 5.		Between 5 and 10.		Between 10 and 20.		Between 20 and 30.		Between 30 and 40.		Between 40 and 50.		Between 50 and 60.		Between 60 and 70.		Between 70 and 80.		Between 80 and 90.		Total.		Total Cases.
	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Male	Fem	
Diseases of bones...	0	0	0	0	1	0	2	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	4	2	6
,, eyes ...	0	0	0	2	1	2	1	0	3	1	0	1	0	3	0	1	0	0	0	1	0	0	5	11	16
,, joints ...	0	0	1	0	0	0	3	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	5	3	8
Disordered bowels.	3	4	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	14
Dysentery.....	0	3	2	1	0	2	0	0	0	2	0	2	1	2	0	2	0	0	0	0	0	0	3	14	17
Dysmenorrhœa	0	0	0	0	0	0	0	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	4	4
Dyspepsia	0	0	0	0	0	0	3	10	3	27	4	19	3	34	1	14	2	9	0	2	0	0	16	115	131
Dysuria	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2	2	4
Epilepsy	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	4	1	5
Epistaxis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Erysipelas	0	0	0	0	0	1	0	3	2	0	1	2	1	1	2	0	0	0	0	1	0	0	6	8	14
Erythema	0	0	0	0	0	3	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	8
Fistula in ano	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	2
Fractures	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	2	1	3
Fungus hæmatodes	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Gastritis chronic...	0	0	0	0	0	0	0	11	3	7	1	4	2	5	0	1	0	0	0	0	0	0	6	28	34
Gonorrhœa	0	0	0	0	0	0	4	8	3	3	2	0	0	0	1	0	0	0	0	0	0	0	10	11	21
Gravel	0	0	0	0	1	0	1	0	0	0	2	1	0	2	1	0	0	0	0	0	0	0	5	3	8
Hæmatemesis	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	1	0	0	0	0	0	0	1	5	6
Hæmoptysis.....	0	0	0	0	0	0	1	0	4	0	0	2	0	0	2	0	0	0	0	0	0	0	7	2	9
Hæmorrhoids	0	0	0	0	0	0	1	0	0	2	1	1	0	0	0	2	0	0	0	0	0	0	2	5	7
Hemicrania	0	0	0	0	0	0	0	1	0	3	0	3	0	1	0	2	1	2	0	0	0	0	1	12	13
Hepatitis, chronic.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1
Hernia	0	0	0	0	1	0	1	0	0	1	1	0	0	2	2	0	1	2	0	0	0	0	6	5	11
,, strangulated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2

	Under 2 years.		Between 2 and 5.		Between 5 and 10.		Between 10 and 20.		Between 20 and 30.		Between 30 and 40.		Between 40 and 50.		Between 50 and 60.		Between 60 and 70.		Between 70 and 80.		Between 80 and 90.		Total.		Total Cases.
	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Male	Fem.	
Hernia humoralis ..	0	0	0	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	4	0	4
Herpes Zoster	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Hypertrop. of heart	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1
Hysteria	0	0	0	0	0	0	0	7	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0	12	12
Hydrocele.....	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Icterus	1	0	0	0	0	0	2	1	1	0	2	0	1	1	0	0	0	0	0	0	0	0	7	2	9
Laryngitis, œdem..	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1
,, chronic	0	0	0	0	0	0	0	1	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	6	6
Leucorrhœa	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0	5	5
Lumbago	0	0	0	0	0	0	0	0	2	1	3	4	4	3	1	3	0	2	1	1	0	1	11	15	26
Mania	0	0	0	0	0	0	0	0	2	0	1	4	5	1	1	1	1	0	0	0	0	0	10	6	16
Menorrhagia	0	0	0	0	0	0	0	2	0	2	0	4	0	5	0	1	0	0	0	0	0	0	0	14	14
Paralysis	0	0	0	0	0	0	2	0	0	0	1	0	2	2	0	1	2	2	0	1	0	0	7	7	14
Parotiditis	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Pericarditis,rheum.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Peritonitis	0	0	0	0	0	0	0	1	1	1	1	2	0	1	0	0	0	0	0	0	0	0	2	5	7
,, chronic...	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3	4
,, ,, puerperal	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
Pertussis	8	8	5	13	1	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	14	27	41
Phlegmasia dolens	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	3	3
Phlogosis	1	1	0	1	0	0	2	1	1	5	3	5	1	1	2	4	0	3	0	1	0	0	10	22	32
Phthisis.....	0	0	0	0	0	0	1	1	1	1	7	1	5	0	2	0	1	0	0	0	0	0	17	3	20
Pleuritis	0	0	0	0	1	0	2	2	1	1	0	1	1	0	0	0	1	1	0	0	0	0	6	5	11
Pleurodynia.....	0	0	0	0	0	0	2	3	1	8	0	5	2	5	3	0	1	2	0	2	0	0	11	13	34
Pneumonia	1	2	1	1	2	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6	4	10

	Under 2 years.		Between 2 and 5.		Between 5 and 10.		Between 10 and 20.		Between 20 and 30.		Between 30 and 40.		Between 40 and 50.		Between 50 and 60.		Between 60 and 70.		Between 70 and 80.		Between 80 and 90.		Total.		Total Cases.
	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Ma.	Fm.	Male	Fem.	
Podagra	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	1	0	0	0	4	1	5
Prolapsus uteri ...	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	0	0	0	0	0	0	0	0	6	6
Pudendal disch. in children ...	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Purpura	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Rheumatism.....	0	0	0	0	0	0	7	1	7	11	7	14	13	10	5	9	3	4	0	1	0	0	42	50	92
..... chronic	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	3	3	4	0	1	0	0	5	11	16
Rubeola	5	20	26	24	15	12	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	57	106
Scarlatina	4	1	11	5	1	9	4	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	20	18	38
Scrofula.....	2	3	3	1	2	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	9	5	14
Stricture of urethra	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2
Synochus	3	0	7	6	15	7	18	23	7	11	3	7	2	3	1	5	1	1	0	0	0	0	58	63	121
Syphilis	0	0	0	0	0	0	4	7	4	7	1	1	1	0	0	0	0	0	0	0	0	0	10	15	25
Tumor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Ulcers	0	0	1	1	0	0	2	2	5	3	3	4	3	6	4	3	5	5	3	3	0	0	26	27	53
Urticaria	0	0	0	0	1	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3	2	5
Varicella	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Varices	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	2	3
Variola	2	9	6	11	7	7	3	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	20	31	51
..... after vacc.	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Worms, intestinal.	0	2	3	3	2	2	0	4	1	3	0	0	0	0	0	0	0	0	0	0	0	0	6	14	20
Wounds, contusions, &c.	0	0	0	1	0	1	11	5	4	1	13	5	6	9	11	4	2	6	4	1	2	0	53	33	86
Total.....	59	92	102	111	77	79	114	166	98	178	90	160	98	159	75	95	46	77	16	32	5	3	780	1152	1932

TABLE 3.—*Shewing the sex and age of the patients when cases terminated fatally.*

	Under 2 years.		2 to 5.		5 to 10.		10 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 to 90.		TOTAL.		TOTAL DEATHS
	Ma.	Fem	Ma.	Fem	Ma.	Fem	Ma.	Fem	Ma.	Fem	Ma.	Fem	Ma.	Fem	Ma.	Fem	Fm.	Fem	Ma.	Fem	Ma.	Fem	Ma.	Fem	
Anasarca	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2
Bronchitis	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5
..... chronic	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	6	0	0	1	2	0	0	3	2	5
Burns and scalds...	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Carcinoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Convulsions.....	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
Cynanche tracheal	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Diarrhœa	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Dysentery	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Erysipelas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1
Fungus hæmatodes	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Hernia, strangulat.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Icterus	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1
Laryngitis, chron.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Mania	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Paralysis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2
Pericarditis	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Peritonitis	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	2
..... chronic	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3
Pertussis	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	5
Phthisis	0	0	0	0	0	0	0	1	1	1	4	1	5	0	2	0	1	0	0	0	0	0	13	3	16
Pleuritis	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2
Pneumonia	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	2	4
Purpura	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Rubeola	1	5	6	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	11	19
Scarlatina.....	2	1	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	8
Synochus	0	0	2	1	1	0	0	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	5	5	10
Variola	0	2	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	6
Total.....	8	16	15	19	4	2	3	8	5	1	6	1	7	2	4	0	2	5	1	2	0	1	55	57	112

Before proceeding to offer any comments upon the results exhibited in the foregoing tables, it is necessary, in order to prevent misconception, to explain the cause of the great disparity which exists between the number of patients attended during the two first and the two last quarters of the year 1836. The great falling off in the numbers towards the close of the year, and more especially during the last quarter, is not in any degree to be considered as a proof either of the salubrity of the season, or of the prosperity of the town, but is entirely referable to the increased vigilance and strictness exercised by the overseers of the poor, and to their refusal to give notes for medical relief to great numbers of persons who had long been in the habit of availing themselves of this species of parochial assistance. Formerly orders for medical relief were granted to almost every applicant without discrimination; they are now given only to paupers, and to persons whose families are large, or whose earnings are not considered sufficient to enable them to pay for physic. There can be no doubt that this increased care and activity on the part of the overseers were called into exercise by the fear that the introduction of the New Poor Law system should be attempted in Birmingham.

The general features of the report for 1836 resemble in a striking degree those of the reports for preceding years; the relative number of patients affected by diseases having their origin in what may be considered as external causes, such as atmospheric vicissitudes, particular occupations, or the indulgence in certain habits of life, exhibit only trifling

changes from year to year; whilst in those diseases which are produced by the unascertained causes of an epidemic, each succeeding year presents to our notice great changes in the relative numbers of those attacked, and of those who become their victims. I shall now proceed to offer a few remarks illustrative of this point, which arise from the consideration of this report.

Rubeola.—In 1835, one case of measles only was recorded, and that terminated favourably. In the present report there appear a hundred and six cases, of which nineteen, or 1 in about $5\frac{1}{2}$, had a fatal termination. The causes of this mortality were various, but the most prominent was gross neglect on the part of the parents of the children attacked. The uneducated classes in Birmingham consider the eruptive fevers, especially measles and small pox, as evils to which their children were born subject, and through which they must necessarily pass, and in consequence of this impression they seldom seek for medical assistance during the progress of these diseases till the danger is too imminent to be avoided. Another cause of the mortality of the epidemic under consideration was the simultaneous existence of hooping cough with the measles: this combination was present in several of the cases, and produced fatal effects in three children, all of whom resided within fifty yards of each other, in a low, damp, exposed situation, the houses being built over a thick stratum of clay. There can be no doubt that in those instances the *locality* contributed powerfully to prevent the recovery of the little patients.

A third cause of the great mortality of the cases of measles was their complication with the pellicular inflammation of the fauces, pharynx, and larynx, called *Diphthérite* by M. Bretonneau. The instances in which this complication existed were numerous, and its effects were very fatal. Three children in one house were successively attacked by measles, followed by *diphthérite*; they all died within five days from the time of the appearance of the eruption. No arguments would induce the parents of these children to suffer their bodies to be examined. In another case which occurred on the day following that of the death of the last of the three children just mentioned, I succeeded in obtaining permission to open the body. James Overton, æt. 5, broke out with the measles on the 8th of June: two days afterwards, when I was desired to see him, the measles still continued out, the bowels were relaxed, the breathing accelerated and attended with a mucous rattle; the countenance was anxious, the extremities cold, and the pulse small; there was also a great difficulty of swallowing, a hoarse cough, and almost total suppression of the voice. Membranous concretions were observed on the roof of the mouth, but the back of the fauces could not be seen. The child died in the afternoon of the following day.

Dissection, thirty-nine hours after death.—The jugular veins were distended with fluid blood; the sub-maxillary glands were considerably enlarged. There was a thin ash-coloured membranous exudation upon the uvula, upon that part of the pharynx which is contiguous to the larynx, upon the laryngeal surface of the epiglottis, and upon the

lips of the glottis as far as the margins of the ventricles of the larynx. In the last mentioned situation, the false membrane adhered rather firmly, in the other places it was but loosely connected with the subjacent parts. The mucous membrane of the epiglottis was thickened and slightly injected, that of the lips of the glottis and ventricles was much reddened. The trachea exhibited but little traces of inflammation. The lungs collapsed but imperfectly; they were in a state of sanguineous congestion, but not inflamed. The false membrane had not passed down the œsophagus, nor did the bowels exhibit any marks of disease.

Many cases of *diphthérite* in its early stages, when the albuminous exudations were confined to the tonsils, the uvula, and the palate, were speedily relieved by the topical application of a strong solution of alum, and the internal use of calomel and antimonial powder; but those cases in which the disease had reached the larynx previous to the calling in of medical aid, were universally fatal.

Scarlatina.—In the two last quarters of the year 1835, there were ninety-four cases of this disease; in the first quarter of 1836, there were twenty-five cases; in the second quarter, ten cases; and in the third quarter, five; shewing the gradual subsidence of a widely spread and fatal epidemic. One half of the deaths from scarlatina occurred previously to the middle of January.

Variola.—The cases of small pox have been six times as numerous in 1836 as they were in the preceding year; more than half of them occurred in the winter quarter. The deaths are to the cases in the proportion of one to nine.

Besides the exanthematous diseases, there are a few others worthy of slight remark. It will be observed in the report that one of the cases of *Erysipelas* terminated fatally; this arose from the extension of the disease to the larynx.

George Barnacle, æt. 52, shoemaker, was attacked with erysipelas of the face, on the 10th of August. On the 14th, when the inflammation in the face had slightly diminished, the patient complained of dryness and heat about the fauces, and difficulty of swallowing; no pain or pressure in the laryngeal region; pulse frequent and weak. On the 16th, the external erysipelas had extended along the front and sides of the neck; there was great pain and difficulty in swallowing; voice weak and hoarse; occasional short cough, producing pain in the laryngeal region. At midday of the 17th, the patient was evidently sinking fast; the respiration was croupal, the voice reduced to a scarcely audible whisper; he could only swallow a teaspoonful of any thing at a time, and a short hacking cough followed every attempt of the kind. He became comatose soon after I saw him, and died at midnight.

Dissection, fifteen hours after death.—The mucous membrane of the pharynx was inflamed, and upon it were two patches of coagulated lymph, beneath which the mucous membrane was much injected, and of a dark red colour. The œsophagus was healthy. The epiglottis was very much thickened, and its edges were curved backwards towards the cavity of the larynx; the membrane investing its anterior face was very tumid, of a bright red colour, and the sub-mucous tissue was

infiltrated with serum. The membrane lining the posterior or laryngeal face of the epiglottis, and the whole of the mucous membrane of the larynx above the superior ligaments of the glottis, were covered with a layer of lymph, which, on being scraped off, shewed the surface beneath of an uniform dark red or nearly purple colour. The aryteno-epiglottic ligaments were thickened. The remainder of the mucous membrane of the larynx and that of the trachea were injected and covered with mucus, but the acute inflammation had not extended below the superior vocal ligaments.

Fungus Hæmatodes.—George Rey, æt. $4\frac{1}{2}$, was put under my care in May, on account of a tumour about twice the size of an orange, situate just below the cartilages of the ribs on the right side; it was uniformly rounded, firmly connected with the integumemts, and apparently with some internal organ also; it was hot, and painful when handled, but exhibited no signs of fluctuation. By the beginning of July the tumour had increased very considerably in size, and more particularly downwards; it had a more irregular surface, and appeared to be divided into two lobes. The abdomen generally was enlarged, and its superficial veins were distended, probably from the pressure of the tumour on deep-seated veins. From the last date to the time of the patient's death, which occurred on the 28th of September, the tumour continued to enlarge, projecting backwards as well as downwards, pushing out the lower ribs of the right side. The general condition of the little patient was, towards the latter periods of life, extremely wretched. He experienced great pain in the belly, which could be

relieved only by large doses of opium; he took very little food, and suffered much from occasional diarrhœa.

Dissection, thirty-four hours after death.—The body was very much emaciated and exsanguineous, the belly immensely large; a quantity of bloody serum was found within the abdomen, and two or three ounces of loosely coagulated blood in the cavity of the pelvis. The tumour which had caused the great distention of the belly occupied all the right side of the abdominal space, pushing the liver upwards, and the cæcum, colon, and small intestines to the left side of the spine; it extended also across the spine, being in front of the left kidney, and behind the intestines. It adhered to the integuments on the right side and to the liver; its shape was irregularly lobular. Internally the tumour was composed of different structures, some parts of the mass being made up of a hard, yellowish, homogeneous substance. others were truly cerebriform, and others again were cysts full of a dark brown pultaceous substance. The peritoneum was studded in various parts with smaller masses of the same disease, both where it covered the liver and where it lined the abdominal parietes. No trace of the right kidney could be found, so that the disease must have originated in that organ. All the other viscera were healthy.

James Balls, æt. 37, tool-maker, applied to me on the 23rd of August, on account of enlargement of the head of the right tibia, which was painful, and totally incapacitated him from following his occupation. The swelling had existed two or three years, and the patient thought it originated in a

blow he had received in that situation. The head of the tibia was enlarged to twice its size, the swelling being more considerable on the internal than on the external side. Its surface was irregular, slightly inflamed, and gave, on being handled, the impression that there was a fluid beneath a strong membrane or fascia. A variety of treatment, chiefly of an antiphlogistic nature, was employed without relief, and a lancet was plunged deeply into the tumour, with no other effect, however, than the escape of a few drops of blood. About the middle of September, the patient was admitted into the town infirmary for the purpose of having his leg amputated, but his bowels became very much disordered, and the operation was postponed. His health manifestly declined, and on the 21st of October his state was as follows:—The right side of the chest was found upon percussion to be dull all over, and respiration could only be distinguished at the posterior and central part of the right lung; the left lung gave indications of slight bronchitis in the lower lobe, and there was puerile respiration in the upper. The patient coughed occasionally, and expectorated dark tenacious mucus; the right parietes of the chest were bulged, and almost immoveable during respiration; the liver was pushed down very low in the abdomen. The leg was œdematous about the ankle, and the tumour at the upper part was increased in size, and presented to the touch that elastic semi-fluctuating feel peculiar to medullary sarcoma. The remedies made use of for the relief of the pectoral disease were unavailing, the patient became comatose, and died on the 28th of October.

Dissection.—The tumour below the knee was caused by a mass of hæmatoid disease surrounding the upper, lateral, and front part of the head of the tibia for about five inches down. It was seated immediately beneath the skin, external to the periosteum, whitish in colour, and of the consistence of liver. On sawing down the bone, the interior, where the cancellated structure should have been, was filled by a whitish spongy mass, which at the upper part had the appearance and consistence of brain, and was rendered dark coloured in some places by an admixture of effused blood. The fibrous external layer of the tibia was about one-eighth of an inch in thickness, and was complete except in one situation, where the absorption of the bone allowed the disease within to communicate with that external to the bone. The knee-joint, its cartilages, and membranes, were entire and healthy.

The right pleural cavity contained a very large quantity of yellowish serum. The lung was contracted to a small size, and lay at the posterior and internal part of the chest, except in one place where it had an adhesion to the pleura lining the cartilages of the ribs, by which means it was stretched across the pleural cavity like an imperfect septum. The costal and phrenic pleuræ were studded all over with globular masses of medullary disease, varying in size from that of a pea to that of a large marble. The pulmonary pleura was hardened and irregularly thickened, partially, no doubt, by chronic inflammation, but more particularly by the medullary disease, which had in this situation more of a membranous form. All the other organs

of the body were healthy, except that a few miliary tubercles were found in the left lung, and a slight degree of bronchitis in the same organ.

Strangulated Hernia.—Two instances of this affection are recorded in the tabular report; in both the subjects were elderly females, one of them died and the other recovered. The circumstances attending the case which terminated favourably are so singular as to be worth mentioning briefly here.

Mrs. Egginton, æt. 86, a stout old widow, of active habits and strong constitution, had been the subject of femoral hernia on the right side for about twelve months, but had never worn a truss, and sometimes the swelling in the groin had gone up, though it was generally more or less down. It had, however, never given her any uneasiness till the 13th of March, when it suddenly increased in size, soon after which vomiting began, and the bowels became painful and constipated. I was not sent for till the 17th; the hernial tumour was then as large as an orange, ovoid in shape, tense, rather sore, and quite irreducible. The bowels were not distended; they had not been opened since the 12th, except very slightly on the morning of the 14th: there was tenderness in the right iliac region. An enema containing castor oil was immediately administered, which brought away a large quantity of fæces, and purgatives were given by the mouth, but they were returned almost instantly; every thing that was swallowed induced vomiting.

The operation was proposed and strenuously urged, but the patient and her friends would not listen to the suggestion. The great age of the patient, and the length of time that the strangulation

had existed, were certainly considerable bars to its success, but death without it appearing to be inevitable, I urgently requested to be allowed to perform it. No persuasion, however, would induce the patient to submit. For the two or three following days the glysters were continued, and cold applications were used to the tumor, at the same time that gentle attempts were made to reduce the hernia. These measures were quite unsuccessful, and the patient remained unable to retain any thing upon the stomach except cold water, and gin and water, which were kept down for a few hours and then returned. A large quantity of fæcal matter was vomited. She continued in this state for many days, getting gradually weaker, but suffering no pain from the hernia, and only a little occasional uneasiness in the bowels.

On the 6th of April (the twenty-fourth day of the strangulation), when I called, she complained of hunger, and said she was being famished to death; to prevent which melancholy catastrophe she ate heartily of bread and cheese, and drank some beer, all of which she relished exceedingly. At four o'clock on the following morning (the 7th) she passed a large quantity of flatus, and speedily afterwards a copious fæcal evacuation, of healthy appearance and of moderate consistence; and in the course of the same day she had three other motions, not quite so large as the first, but amounting altogether to a chamber-pot full. I found her in the middle of the day very weak and sinking, but she had not vomited since the time of the first motion; the hernial tumor appeared to be undiminished; it still felt very tense, though a slight degree of fluctuation could be per-

ceived. Her countenance was sunken and depressed, and her pulse easily compressible; she refused to take medicine, but was willing to have nourishing things and gin and water, which were ordered to be given frequently and in small quantities. 15th, Mrs. Egginton, though still weak and much reduced in flesh, was in a satisfactory state; she took liquid nourishment, eggs, and brandy and water, in moderate quantities, and her bowels were moved every other day without the use of medicine. She had no pain in the hernia, which was become much smaller, and felt hard and rather lobulated, as if it were composed entirely of omentum. On the 15th of June she had completely recovered, and ate, drank, and walked about, as well as ever.

Laryngitis.—The case of œdematous laryngitis was cured by the operation of tracheotomy followed by the exhibition of mercury; but as the details of this case have been given in another place, it is unnecessary for me to recur to them here. The patients affected with chronic laryngitis, six in number, were all females, and, with one exception, the disease was one of that kind which produces thickening of the laryngeal mucous membrane, and the symptoms of which are pain in the region of the larynx, dry, shrill cough, dyspnœa and loss of voice: they were all cured by leeches and mercury. The remaining case was one of idiopathic ulcerative laryngitis, and the patient died from the exhaustion produced by the constant cough, dyspnœa, and difficulty of swallowing.

To the usual table which heads the preceding reports, I have added in the present two others,

one shewing the age and sex of all the patients, together with the disease from which they suffered; and if other surgeons holding similar situations could be induced to adopt a similar plan, very important data, I conceive, would be obtained for the medical statistician. The other table exhibits the sex and age of all the parties whose diseases had a fatal termination. It would require more time than I can afford accurately to analize these tables; but there is one result to which I beg to draw the attention of the reader, viz., the extreme fatality of infantile diseases. Of the four hundred and sixty-four patients under five years of age, fifty-eight died, giving a proportion of one death to every eight cases at that period of life. Of the remaining one thousand four hundred and sixty-eight patients, fifty-four only died, giving a proportion of one death in every two hundred and seventy-five cases in persons above the age of five years.

Of the fifty-eight deaths in children under the age of five years, twenty-nine or one half were caused by the *exanthematous* diseases; fifteen by affections of the lungs and air passages, four by convulsions, three by fevers, two by dysentery, and the remaining five by chronic disease and accident.

Of the fifty-four deaths in persons above the age of five years, only five were occasioned by the exanthematous diseases, whilst twenty-seven or one half of the whole were caused by diseases of organs contained within the chest.

The influence of *occupation* on the production of disease is a subject of great and increasing importance, and though, owing to the large number of the branches of trade pursued in Birmingham, and

the comparatively small number of the patients, each individual report can do but little towards forwarding our knowledge on the subject, I consider no apology necessary for offering the following table. It exhibits the occupations of four hundred and eighty-three persons affected with seven of the more prevalent diseases :—

Occupations.	Bronchitis.	Chr. bronchitis.	Constipation.	Dyspepsia.*	Phthisis.	Rheumatism.†	Synochus.
MALES.							
Watchman	1	0	0	0	0	0	0
Out-door labourers	2	3	2	0	0	10	4
Hawkers	1	0	1	0	1	1	0
Errand-boys	2	0	0	0	0	1	3
Butcher	0	0	0	0	0	0	1
House-painters	0	0	0	0	0	2	0
Smiths and forgers in iron	4	6	0	5	0	7	2
Casters in brass and iron	3	3	2	1	0	3	1
Bakers	0	0	0	0	0	3	0
Nail and screw-makers	1	2	0	0	0	1	2
Wire-drawers and workers	0	0	0	0	1	4	1
Cutlers and tool-makers	3	3	0	1	0	2	1
Platers	2	3	0	0	4	2	0
Button-makers	2	3	0	0	0	1	0
Pearl and bone button-makers	0	3	0	0	1	3	4
Gun-barrel & lock-filers, and gun-finishers	6	3	1	6	0	3	5
Brass-founders	4	4	1	1	1	4	3
Gilt and steel-toy-makers	1	0	1	1	1	0	1
German-silver & Britannia-metal-workers	1	0	1	0	1	1	0
Coach-harness and bit-makers	2	0	0	0	1	0	0
Blank tray-makers	0	3	0	1	0	0	0
Casting pit-maker	1	0	0	0	0	0	0
Iron candlestick-maker	0	0	0	0	0	1	0
Carpenters and coopers	0	2	0	0	0	1	1
Glass-cutters and lapidaries	1	0	0	2	1	2	1
Flax-dresser	0	1	0	0	0	0	0
Basket-makers	1	0	0	0	0	1	0
Printers and book-binders	0	0	0	1	1	0	2
Book-keeper	0	0	0	0	1	0	0
Hair-dresser	0	0	0	0	0	1	0
Shoe-makers	0	3	0	3	3	2	1
Tailors	0	1	0	0	0	2	0
Total Males	38	43	9	22	17	58	33

* Including chronic gastritis.

† Including chronic rheumatism and lumbago.

Occupations.	Bronchitis.	Chr. bronchitis	Constipation.	Dyspepsia	Phthisis.	Rheumatism.	Synochus.
FEMALES.							
Out-door labourers	0	0	0	3	0	3	0
Washer-women and char-women	6	6	2	6	0	8	3
Domestic servants and warehouse-women	2	2	1	10	0	0	3
Button-makers	2	4	1	6	0	4	4
Pearl and bone button-makers	6	0	3	9	1	3	5
Florentine button-makers	2	0	2	3	0	0	2
Gilt and steel-toy-makers	3	1	1	4	0	2	4
Nail and screw-makers	1	0	1	1	0	0	0
Iron spoon and candlestick-makers	1	0	1	6	0	0	0
Snuffer-makers	1	0	1	2	0	0	0
Brass-founders	0	1	0	0	0	0	2
Curtain-ring-makers	2	0	0	0	0	0	0
Gun-barrel-filing	1	0	2	4	1	0	0
Gun-stock-colourers	0	1	0	0	0	2	0
Britannia-metal-workers	0	0	0	0	0	0	2
Lackerers	1	0	0	5	0	0	2
Burnishers	0	0	2	1	0	1	1
Japanners	0	1	0	2	0	1	4
Paper-colourers	0	0	0	1	0	0	1
Pipe-makers	0	0	2	1	0	0	0
Whip-makers	0	1	0	2	0	0	0
Brush-makers	1	0	0	0	0	0	1
Lapidaries and glass-polishers	2	0	0	2	0	2	0
Making and carding hooks and eyes	1	2	2	4	0	1	0
Pin-heading and sticking	1	1	1	2	0	4	3
Sempstresses	4	3	2	16	0	4	2
Shop-keepers	2	0	0	2	0	2	0
School-mistresses	1	1	0	1	0	0	4
Total Females	40	24	24	93	2	37	43
Total Males and Females	78	67	33	115	19	95	76

The occupations in the preceding table are so many and so various, that it is exceedingly difficult to arrange them in any larger classes, the separate parts of each of which shall have much that is common, and, at the same time, peculiar to themselves alone. Perhaps the following table may afford some assistance; in it the results of the preceding one are generalized, by dividing the occupations into those necessarily attended by frequent exposure

to the weather; those attended by continual exposure to the heat of a fire; those in which the work is performed in covered shops, and those of a sedentary nature.

		Bronchitis.	Chr. bronchitis.	Constipation.	Dyspepsia.	Phthisis.	Rheumatism.	Synochus.	Total.
Out-door occupations	Males	6	3	3	0	1	14	8	35
	Females... ..	6	6	2	9	0	11	3	37
Occupations exposed to heat, Males		7	9	2	6	0	13	3	40
Occupations carried on in covered shops	Males	25	27	4	13	12	26	21	128
	Females.....	25	11	17	59	2	15	31	160
Sedentary occupations	Males.....	0	4	0	3	4	5	1	17
	Females.....	9	7	5	25	0	11	9	66
Total		78	67	33	115	19	95	76	483

I refrain from offering any remark upon the results of the foregoing table, as I feel persuaded that inferences drawn from so small a number of facts would be not merely inconclusive, but replete with error also.

FRED. RYLAND.

Birmingham, Feb. 2, 1838.

ARTICLE XI.

A REPORT OF THE OUT-CASES

ATTENDED

BY THE LATE GEORGE PARSONS, ESQ.,

AT THE

BIRMINGHAM INFIRMARY,

From January the 1st to December the 31st, 1836.

BY S. BERRY, ESQ.

Surgeon to the Town Infirmary.

	Qr. ending March 31.		Qr. ending June 30.		Qr. ending Sep. 30.		Qr. ending Dec. 31.		Total for the year.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Abortus	3	...	1	...	...	...	1	...	5	...
Abscessus	16	...	27	...	17	...	11	...	71	...
Abscessus psoaticus	1	...	...	...	...	...	1	...	2	...
Amenorrhœa	9	...	7	...	7	...	4	...	27	...
Anasarca	3	...	4	...	4	...	...	...	11	...
Aphthæ	3	...	2	...	...	...	...	...	5	...
Apoplexia	4	1	1	...	2	...	1	...	8	1
Ascites	...	...	...	...	1	1	1	...	2	1
Asthenia	10	...	21	...	9	...	7	...	47	...
Bronchitis acutus	13	3	10	2	10	...	16	3	49	8
,, chronic.	113	...	61	1	26	2	40	1	240	4
Calculus (Vesicæ).	...	...	...	...	...	...	1	...	1	...
Catarrhus	61	...	33	...	30	...	17	...	141	...
,, epidem.	...	...	12	...	12	...	...	...	24	...
Cephalœa	21	...	22	...	8	...	12	...	63	...
Cholera biliosa	...	...	2	...	16	...	2	...	20	...
Chorea St. Viti	...	...	1	...	...	...	...	...	1	...
Colica pictonum	4	...	...	...	1	...	...	...	5	...
Constipatio	31	...	33	1	24	...	5	...	93	1
Convulsions (inft.)	11	3	1	...	4	1	3	1	19	5
Cutaneous diseases	58	...	28	...	22	...	17	...	125	...
Cynanche tonsillar	16	...	12	...	14	...	5	...	47	...
Dentitio	23	1	7	...	1	...	...	...	31	1
Diarrhœa	19	1	39	1	55	...	9	1	122	3
Dysenteria	...	...	2	2	...	...	...	...	2	2
Dyspepsia	49	...	55	...	55	...	24	...	183	...
Dysuria	4	...	7	...	3	...	2	...	16	...
Epilepsia	5	...	5	2	2	...	2	...	14	2
Erysipelas	3	...	1	...	2	...	3	...	9	...
Erythema margin.	...	...	...	...	...	...	1	...	1	...
,, nodosum	3	...	4	...	1	...	1	...	9	...
Febris remitt. inft.	2	1	9	1	4	...	...	...	15	2
Fistula in perinæo.	3	...	...	...	...	...	...	...	3	...
Fracturæ	2	...	2	...	2	...	1	...	7	...
Fungus medullaris	...	...	...	...	1	1	...	...	1	1
Gonorrhœa	29	...	19	...	18	...	9	...	75	...
Hæmaturia	1	...	2	...	...	...	...	...	3	...
Hæmoptoë	3	...	1	...	3	...	...	...	7	...
Hæmorrhœa petech	2	...	0	..	...	...	...	...	2	...

	Qr. ending March 31.		Qr. ending June 30.		Qr. ending Sept. 10.		Qr. ending Dec. 31.		Total for the year.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Hæmorrhois	5	...	9	...	2	...	...	...	16	...
Hepatitis	...	...	1	1	...	...	...	...	1	1
Hernia	...	...	4	...	3	...	2	...	9	...
..... humoralis	2	...	2	...	...	...	2	...	6	...
Hydrocephalus ac.	3	2	3	2	...	...	...	...	6	4
Hysteria	5	...	3	..	4	...	...	...	12	...
Icterus	1	...	4	1	5	...	2	1	12	2
Laryngitis acutus	1	...	...	...	...	...	...	...	1	...
Leucorrhœa	...	...	3	...	...	...	...	...	3	...
Lumbago	5	...	3	...	5	...	2	...	15	...
Mania	2	...	3	...	2	1	3	...	10	1
Marasmus	7	4	4	2	3	1	...	...	14	7
Menorrhœa	2	...	3	...	4	...	3	...	12	...
Nævus	...	...	1	...	...	...	...	...	1	...
Neuralgia	2	...	...	...	...	...	...	...	2	...
Ophthalmia	10	...	10	...	8	...	2	..	30	...
Paralysis	3	...	3	1	...	...	...	...	6	1
Pericarditis acutus	...	...	...	...	...	...	2	1	2	1
..... chron.	2	1	...	...	...	...	...	...	2	1
Peritonitis acutus	2	...	2	1	...	...	1	...	5	1
Pertussis	62	8	18	2	4	1	2	...	86	11
Phlogosis	18	...	18	...	9	...	7	...	52	...
Phthisis pulmonum	18	11	13	10	3	3	4	4	38	28
Pleuralgia	7	...	10	...	3	...	...	...	20	...
Pleuritis	4	...	5	...	7	1	2	...	18	1
Pneumonia	1	1	1	...	...	...	...	...	2	1
Podagra	...	...	...	...	2	...	...	...	2	...
Prolapsus uteri	2	...	1	...	2	...	1	...	6	...
Retentio urinæ	...	...	1	...	1	...	...	...	2	...
Rheumatism, acute	17	...	11	...	4	...	4	...	36	...
..... chron.	3	...	9	...	5	...	1	...	18	...
Rubeola	...	...	125	10	99	12	2	...	226	22
Sarcocele	1	...	...	...	...	...	...	...	1	...
Scarlatina	21	3	9	...	4	...	...	...	34	3
Scirrhus	1	..	...	...	...	...	...	...	1	...
Sciatica	2	...	1	...	2	...	1	...	6	...
Scrofula	1	...	4	...	1	...	1	...	7	...
Synochus	45	1	50	2	31	1	26	2	152	6
Syphilis	14	...	15	...	7	...	12	...	48	...
Ulcera	20	...	26	...	16	...	18	...	80	...
Urticaria	...	...	1	...	2	...	...	...	3	...
Variola	14	2	5	...	7	1	13	1	39	4
..... post Vaccin.	5	...	...	...	...	...	...	...	5	...
Vermes intestin.	15	...	12	...	9	...	3	...	39	...
Various cases of wounds, sprains, and burns	37	2	34	...	21	...	12	...	104	2
Totals	885	45	858	42	629	26	322	15	2694	128

The following tables shew how many of these 2694 cases came under Mr. Parsons' care in each of the twelve months, and the number of them that terminated fatally; they also exhibit what proportion of them occurred before the age of ten years, and what afterwards, and likewise the different numbers in the two sexes.

	MALES.				FEMALES.			
	Under 10 years.		Above that age.		Under 10 years.		Above that age.	
	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.
January	36	4	81	2	43	6	132	5
February	35	3	75	2	40	2	120	3
March	44	7	75	5	39	4	165	2
April	34	2	57	4	26	2	131	5
May	31	2	60	2	31	2	130	5
June	77	7	88	4	63	5	130	3
July	51	4	65	2	53	3	115	1
August	32	4	51	2	33	1	90	3
September	16	2	46	2	13	0	64	2
October	9	1	24	1	12	0	57	2
November	8	0	32	3	7	1	68	2
December	7	0	41	3	13	1	44	0
Total	380	36	695	32	373	27	1246	33

	TOTAL MALES.		TOTAL FEMALES.		OF BOTH SEXES.	
	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.
January	117	6	175	11	292	17
February	110	5	160	5	270	10
March	119	12	204	6	323	18
April	91	6	157	7	248	13
May	91	4	161	7	252	11
June	165	11	193	8	358	19
July	116	6	168	4	284	10
August	83	6	123	4	206	10
September	62	4	77	2	139	6
October	33	2	69	2	102	4
November	40	3	75	3	115	6
December	48	3	57	1	105	4
	1075	68	1619	60	2694	128

In the next tables I have given the proportionate mortality of the several totals of the preceding

columns, and also, for the sake of comparison, the proportionate mortality of the same classes of cases of the year 1835.

	Under 10 years. CASES.	DIED.	Proportionate mortality.	Proportionate mortality, 1835.
Males	380	35	1 to 10,86	1 to 10,
Females	373	27	1 to 13,8	1 to 11,82
Total	753	62	1 to 12,15	1 to 10,9
	Above that age.			
Males..	695	33	1 to 21,06	1 to 21,65
Females	1246	33	1 to 37,76	1 to 40,54
Total	1941	66	1 to 29,4	1 to 30,88
MALES.				
Under 10 years ..	380	35	1 to 10,86	1 to 10,
Above that age ..	695	33	1 to 21,06	1 to 21,65
Total	1075	68	1 to 15,8	1 to 16,03
FEMALES.				
Under 10 years ..	373	27	1 to 13,8	1 to 11,82
Above that age ..	1246	33	1 to 37,76	1 to 40,54
Total	1619	60	1 to 26,98	1 to 26,4
TOTAL.				
Males	1075	68	1 to 15,8	1 to 16,03
Females	1619	60	1 to 26,98	1 to 26,4
Total	2694	128	1 to 20,88	1 to 21,1

I think it may not be uninteresting to exhibit, in a tabular form, the whole of the one hundred and twenty-eight cases which had a fatal termination, so as to point out, not only the diseases, but also to a certain extent, the ages and sexes of these patients, and the period of life at which the greatest mortality prevailed amongst them. One of my reasons for doing this, is to shew how large a number of the deaths occurred under the age of ten years, and before the health of the individuals could have been directly influenced by the manufactures of the town. Of these fatal cases, fifty-nine were under the age of five years, and sixty-three

under the age of ten years. Of the sixty-five cases above the age of ten years, only forty-six were engaged in any employment; their occupations, and the diseases of which they died, are given in the subsequent table.

Diseases, ages, and sexes of the 128 *fatal cases.*

	1st Year.	1st to 5th.	5th to 10th.	10th to 20th.	20th to 30th.	30th to 40th.	40th to 50th.	50th to 60th.	60th to 70th.	70th to 80th.	80th to 90th.	Males,	Females.	Total.
Remittent fever	2	0	0	0	0	0	0	0	0	0	0	0	2	2
Pneumonia	1	0	0	0	0	0	0	0	0	0	0	1	0	1
Pertussis	5	6	0	0	0	0	0	0	0	0	0	3	8	11
Phthisis pulmonatis	0	0	0	5	7	7	9	0	0	0	0	17	11	28
Morbus cæruleus	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Diarrhœa	1	1	0	0	0	0	0	0	0	0	1	3	0	3
Marasmus	1	5	1	0	0	0	0	0	0	0	0	7	0	7
Bronchitis acutus	1	0	0	0	1	0	1	0	2	0	0	1	4	5
Bronchitis chronicus	0	0	0	0	1	0	0	1	1	1	0	3	1	4
Scarlatina	0	2	1	0	0	0	0	0	0	0	0	1	2	3
Variola	1	0	1	1	1	0	0	0	0	0	0	0	4	4
Hydrocephalus acutus	0	2	0	2	0	0	0	0	0	0	0	2	2	4
Dentitio	4	2	0	0	0	0	0	0	0	0	0	2	4	6
Burn	0	1	0	0	0	0	0	0	0	0	0	1	0	1
Apoplexia	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Convulsio	0	2	0	0	0	0	0	0	0	0	0	1	1	2
Synochus	0	1	0	1	0	1	1	0	1	0	0	3	2	5
Pericarditis chronicus	0	0	0	0	0	0	0	0	1	0	0	1	0	1
Pericarditis acutus	0	0	0	0	1	0	0	0	0	0	0	0	1	1
Paralysis	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Icterus	0	0	0	0	0	0	0	1	1	0	0	0	2	2
Peritonitis acutus	0	0	0	0	1	0	0	0	0	0	0	1	0	1
Dysenteria	0	0	0	0	1	0	1	0	0	0	0	0	2	2
Hepatitis	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Mania	0	0	0	0	2	0	0	0	0	0	0	2	0	2
Constipatio	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Epilepsia	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Rubeola	1	20	0	0	1	0	0	0	0	0	0	12	10	22
Retentio urinæ	0	0	0	0	0	0	0	0	1	0	0	1	0	1
Pleuritis	0	0	0	0	0	0	0	1	1	0	0	1	1	2
Medullary fungus of the breast	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Ascites	0	0	0	0	0	1	0	0	0	0	0	0	1	1
Total	17	42	4	10	16	9	13	3	9	3	2	65	63	128

MALES.	Phthisis.	Epilepsia	Bronchitis chr.	Bronchitis ac.	Dysenteria.	Rubeola.	Variola.	Mania.	Synochus.	Pericarditis ac.	Icterus.	Diarrhœa.	Apoplexia.	Peritonitis ac.	Hepatitis.	Constipatio.	Total.
Smiths	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Butcher	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Lapidary	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Cabinet-polisher	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		1
Ostler	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ivory-turners	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
Labourers	0	0	0	1	0	0	0	0	2	0	0	1	0	0	0	0	4
Chair-maker	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Pearl-button-maker	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Silversmith	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Jeweller	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Japanner	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Carpenter	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Coal-heavers	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Spectacle frame-maker	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Paper box-maker	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Brass-founders	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
Porter	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Coach harness-maker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Pin-maker	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
FEMALES.																	
Wire-worker	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Washer-women	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3
Button-makers	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	3
Pin-maker	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Midwife	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Screw-maker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Nurse	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Glass-polisher	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sempstresses	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Servants	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
List-shoe-maker	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mat-maker	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Chain-maker	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Total	20	1	5	4	1	1	2	2	3	1	1	1	1	1	1	1	46

The following tables present a tabular view of particular diseases, with the ages and sexes of the individuals, and also their employments:—

BRONCHITIS, ACUTE AND CHRONIC.

	Males.	Died.		Females.	Died.
First quarter ...	40	1	First quarter ...	86	2
Second quarter ...	25	2	Second quarter ...	46	1
Third quarter ...	13	1	Third quarter ...	23	1
Fourth quarter ...	22	3	Fourth quarter ...	34	1
	100	7		189	5

		For 1835.
The 289 cases of bronchitis are, to the whole number of cases of disease, as	1 to 9,32 ...	1 to 12,55
The deaths, 12, are, to the 289 cases, as	1 to 24, ...	1 to 19,75
The deaths, 12, are, to the whole number of deaths, as	1 to 10,66 ...	1 to 11,75
The deaths, 12, are, to the whole number of cases of disease, as	1 to 224,5 ...	1 to 247,92

The following tables shew the periods of life at which, in either sex, the 289 cases occurred; and also the occupations of the patients:—

	Under 30 yrs.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	Total.
Males	20	24	14	22	13	5	2	100
Females ...	46	45	38	24	28	6	2	189
Total...	66	69	52	46	41	11	4	289

MALES.

Porters	4	Steel-toy-grinder	1
Pencil-case-maker ...	1	Tailors	2
Brass-founders	2	Bricklayer	1
Button-burnishers	3	Ivory and bone-turner ...	1
Labourers	8	Edge-tool-grinders	2
Bellows-makers	3	Gas-worker	1
Shoe-makers	5	Watermen	2
Platers	2	Coal-heavers	2
Comb-maker	1	Plasterer	1
Smiths	3	Brace-maker	1
Painters	4	Wood-turner	1
Brush-makers	3	Pearl-button-maker ...	1
Sawyer	1	Britannia-metal-worker ...	1
Pedlars	5	Refiner	1
Gardener	1	Carpenters	2
Hat-maker	1	Huckster	1
Stirrup-makers	2	Chain-maker	1
Locksmith	1	Gimlet-maker	1
Spur-maker	1	Glass-polisher	1
Coke-maker	1	Gilt-toy-makers	2
Saddler	1	Chair-maker	1
Button-makers	3	Jewellers	2
Snuffer-maker	1	No occupation	13
Steel-toy-maker	1		

FEMALES.

Washer-women	31	Pearl-button-makers	2
Tray-polishers	2	Buckle-maker	1
Hucksters	5	Stair-rod-maker	1
Brace-makers	4	Sempstresses	9
Fire-iron-maker	1	Brass-workers	2
Servants	4	Glazing spectacles	1
Button-makers	6	Screw-makers	2
Fur-cutter	1	Gilt-toy-burnisher	1
Schoolmistresses	2	Steel-toy-maker	1
Hook and eye-makers	2	Hawkers	3
Pin-makers	4	Whip-maker	1
Japanners	4	Packer	1
Midwife	1	Steel-pen-maker	1
Gilt-toy-makers	2	Bridle-stitcher	1
Shoe-makers and binders	2	Wire-worker	1
Weaver	1	Net-maker	1
Glass-worker	1	Laundress	1
Spoon-burnisher	1	Chain-makers	2
Spoon-maker	1	No occupation	82

PHTHISIS PULMONUM.

Males.	Died.	Females.	Died.
24	17	14	11

		For 1835.
The 38 cases of consumption are, to the whole number of cases of disease, as	1 to 78,9	1 to 78,3
The deaths, 28, are, to the 38 cases, as	1 to 1,35	1 to 1,68
The deaths, 28, are, to the whole number of deaths, as	1 to 4,57	1 to 6,13
The deaths, 28, are, to the whole number of cases of disease, as	1 to 96,21	1 to 129,35

	Under 20 yrs.	From 20 to 30.	From 30 to 40	From 40 to 50.	Total.
Males	7	9	6	2	24
Females	0	6	3	5	14
Total	7	15	9	7	38

MALES.

Brass-workers	2	Hawker	1
Servant	1	Butcher	1
Painter	1	Lapidary	1
Carpenter	1	Cabinet-polisher	1
Smith	1	Pearl-button-maker	1
Ivory and bone-turner	1	Silversmith	1
Chaser	1	Japanner	1
Coal-heavers	2	Porters	2
Shoe-maker	1	Ostler	1
Spectacle-frame-maker	1	No occupation	1
Pin-grinder	1		

FEMALES.

Varnisher	1	Chain-maker	1
Servant	1	Glass-polisher	1
Pin-maker	1	No occupation	7
Sempstresses	2		

SYNOCHUS.

	MALES.				FEMALES.			
	Under ten yrs.	Died.	Above ten yrs.	Dd.	Under ten yrs.	Died.	Above ten yrs.	Dd.
First quarter	10	0	10	1	10	0	15	0
Second quarter	8	0	13	1	5	0	24	1
Third quarter	3	0	13	1	6	0	9	0
Fourth quarter	2	0	7	0	8	0	9	2
Total	23	0	43	3	29	0	57	3

	For 1835.
The 152 cases of synochus are, to the whole number of cases of disease, as	1 to 17,73 ... 1 to 15,18
The deaths, 6, are, to the 152 cases, as	1 to 25,83 ... 1 to 15,08
The deaths, 6, are, to the whole number of deaths, 128, as	1 to 21,33 ... 1 to 10,85
The deaths, 6, are, to the whole number of cases of disease, as	1 to 449, ... 1 to 228,85

	Under 10 yrs.	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	Total.
Males	23	25	10	1	3	1	1	2	0	66
Females	29	28	9	9	1	3	5	1	1	86
Total	52	53	19	10	4	4	6	3	1	152

MALES.

Gilt-toy-makers	1
Pearl-button-maker	1
Pocket-book lock-maker	1
Brass-founders	2
Labourer	1
Chain-maker	1
Painter	1
Clerk	1
Steel-toy-maker	1
Spectacle-frame-maker	1
Bricklayer	1
Watch-key-maker	1
Nailer	1
Chaser	1
Bone-turner	1
Smiths	2
Pearl-ornament-maker	1
Dry steel-grinder	1
Carpenter	1
Tobacco-maker	1
Brass-worker	1
Frying-pan-maker	1
Glass-cutter	1

MALES.

Printer	1
Pin-maker	1
Platers	2
No occupation	37

FEMALES.

School-mistress	1
Sempstresses	3
Paper-button-maker	1
Florentine-button-makers	3
Huckster	1
Pin-maker	1
Patten-tye-maker	1
Steel-pen-maker	1
Washer-women	6
Clock-dial-maker	1
Screw-maker	1
Brace-maker	1
Button-makers	2
Bridle-stitcher	1
Lapidary	1
Servants	3
No occupation.	57

SCARLATINA.

	Males.	Died.		Females.	Died.
First quarter ...	12	1	First quarter ...	9	2
Second quarter ...	4	0	Second quarter ...	5	0
Third quarter ...	1	0	Third quarter ...	3	0
Fourth quarter ...	0	0	Fourth quarter ...	0	0
	17	1		17	2

		For 1835.
The 34 cases of scarlatina are, to the whole number of cases of disease, as	1 to 79,23 ...	1 to 20,95
The 3 deaths are, to the whole number of cases, 34, as	1 to 11,33 ...	1 to 6,17
The 3 deaths are, to the whole number of deaths, 128, as	1 to 42,66 ...	1 to 6,13
The 3 deaths are, to the whole number of cases of disease, as	1 to 898, ...	1 to 129,35

	Under 1 year.	From 1 to 5.	From 5 to 10.	From 10 to 20.	From 30 to 40.	Total.
Males	1	12	2	2	0	17
Females	0	10	3	3	1	17
Total	1	22	5	5	1	34

Of the thirty-four cases of scarlatina, only three were engaged in any employment.

MALE.		FEMALES.	
Button-maker	1	Servants	2

PERTUSSIS.

	Males.	Died.		Females.	Died.
First quarter ...	26	2	First quarter ...	36	6
Second quarter ...	5	1	Second quarter ...	13	1
Third quarter ...	2	9	Third quarter ...	2	1
Fourth quarter ...	1	0	Fourth quarter ...	1	0
	34	3		52	8

		For 1835.
The 86 cases of pertussis are, to the whole number of cases of disease, as	1 to 31,32 ...	1 to 78,29
The deaths, 11, are, to the 86 cases, as	1 to 7,81 ...	1 to 9,5
The deaths, 11, are, to the whole number of deaths, as	1 to 11,54 ...	1 to 35,25
The deaths, 11, are, to the whole cases of disease, as	1 to 244,90 ..	1 to 743,75

	Under 1 year.	From 1 to 5.	From 5 to 10.	Total.
Males	9	24	1	34
Females	8	34	10	52
Total	17	58	11	86

RUBEOLA.

	Males.	Died.		Females.	Died.
Second quarter ...	72	4	Second quarter ...	53	6
Third quarter ...	46	8	Third quarter ...	53	4
Fourth quarter ...	1	0	Fourth quarter ...	1	0
	119	12		107	10

The 226 cases of rubeola are, to the whole number of cases of disease, as ..... 1 to 11,92
The 22 deaths are, to the 226 cases, as ..... 1 to 27,
The 22 deaths are, to the whole number of deaths, as ... 1 to 5,81
The 22 deaths are, to the whole number of cases of disease, as ..... 1 to 122,45

	Under 1 year.	From 1 to 5.	From 5 to 10.	From 10 to 20.	From 20 to 30.	Total
Males	6	92	17	3	1	119
Females	17	81	6	1	2	107
Total	23	173	23	4	3	226

Of the two hundred and twenty-six cases of rubeola, only four were engaged in any employment, viz.:—

MALE.		FEMALES.	
Servant	1	Screw-makers	2
		Market-woman	1

VARIOLA.

	Males.	Died.		Females.	Died.
First quarter ...	11	0	First quarter ...	8	2
Second quarter ...	2	0	Second quarter ...	3	0
Third quarter ...	3	0	Third quarter ...	4	1
Fourth quarter ...	7	0	Fourth quarter ...	6	1
	23	0		21	4

		For 1835.
The 44 cases of variola are, to the whole number of disease, as	1 to 61,22 ...	1 to 212,5
The 4 deaths are, to the cases of variola, as	1 to 11, ...	1 to 4,66
The 4 deaths are, to the whole deaths, as	1 to 32, ...	1 to 47,
The 4 deaths are, to the whole number of cases of disease, as	1 to 673,5 ...	1 to 991,66

Of the forty-four cases of variola, five only occurred after vaccination, none of which died; the relative ages and sexes are as follows:— males, two at six years, one at thirteen years, and one at twenty-three years; female, one at eighteen years.

	Under 1 year.	From 1 to 5.	From 5 to 10.	From 10 to 20.	From 20 to 30.	Total.
Males	1	15	4	2	1	23
Females	4	12	0	4	1	21
Total....	5	27	4	6	2	44

Of the forty-four cases of variola, only seven were engaged in any occupation, viz :—

MALES.		FEMALES.	
Wood-turner	1	Florentine-button-maker ...	1
Shoe-maker	1	Screw-makers	2
		Servant	1
		Button-maker	1

DYSPEPSIA.

	Males.		Females.
First quarter	12	First quarter	37
Second quarter ...	17	Second quarter ...	38
Third quarter ...	10	Third quarter	45
Fourth quarter ...	4	Fourth quarter ...	20
	43		140

		For 1835.
The 183 cases of dyspepsia are, to the whole number of cases of disease, as	1 to 14,72 ...	1 to 12,97

	Under 20 yrs.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	Total.
Males	1	17	10	8	3	4	0	43
Females	12	36	32	40	12	7	1	140
Total	13	53	42	48	15	11	1	183

MALES.

Shoe-makers	7
Cabinet-maker	1
Bit-maker	1
Brass-founders	3
Pedlar	1
Smiths	2
Painter	1
Skewer-maker	1
Plater	1
Tailors	3
Carpenters	3
Comb-maker	1
Butcher	1
Jewellers	2
Pocket-book-maker	1
Brass-burnisher	1
Curriers	2
Gilt-toy-maker	1
Wire-workers	2
Chain-maker	1
Soldier	1
Printer	1
Edge-tool-maker	1
Steel-toy-maker	1
Silversmith	1
No occupation	2

FEMALES.

Lamp-makers	4
Sempstresses	12
Washer-women	21
Lacquerer	1

FEMALES.

Pin-makers	2
Lock-maker	1
Screw-makers	2
Steel-toy-maker	1
Servants	5
Shoe-binders	5
Bone-button-maker	1
Nurse	1
Gilt-toy-burnisher	1
Comb-makers	2
Gilt-toy-makers	2
Brace-bit-maker	1
Feather-dresser	1
Button-makers	5
Brass-founder	1
Percussion-cap-maker	1
Straw-bonnet-makers	2
Laundresses	2
Hook-and-eye-maker	1
Burnishing plated wares	3
Huckster	1
Japanner	1
Brace-makers	2
Florentine button-maker	1
Schoolmistresses	2
Worsted-winder	1
Hinge-maker	1
Packer	1
Nailer	1
No occupation	53

DIARRHŒA.

	Males.	Died.
First quarter	7	1
Second quarter	17	0
Third quarter	27	0
Fourth quarter	7	1
	58	2

	Females.	Died.
First quarter	12	0
Second quarter	22	1
Third quarter	28	0
Fourth quarter	2	0
	64	1

	For 1835.
The 122 cases of diarrhœa are, to the whole number of cases of disease, as	1 to 22,08 ... 1 to 14,58
The deaths, 3, are, to the 122 cases, as	1 to 40,66 ... 1 to 29,14
The deaths, 3, are, to the whole number of deaths, as	1 to 42,66 .. 1 to 20,14
The deaths, 3, are, to the whole number of cases of disease, as	1 to 898, ... 1 to 425,

	Under 1 year.	From 1 to 5.	From 5 to 10.	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	Total.
Males	17	17	3	1	8	4	4	1	0	2	1	58
Females	9	14	2	7	9	6	7	7	2	1	0	64
Total	26	31	5	8	17	10	11	8	2	3	1	122

MALES.

Printer	1
Steel-toy-maker	1
Shoe-makers	2
Packer	1
Waterman	1
Brass-founders	2
Pedlars	2
Chair-maker	1
Plane-maker	1
Cabinet-makers	2
Comb-maker	1
Tailor	1
Chain-maker	1
Labourer	1
Porters	2
No occupation	38

FEMALES.

Screw-maker	1
Lacquerer	1
Nurse	2
Burnishing plated wares	2
Sempstresses	2
Button-maker	1
Washer-women	4
List-shoe-maker	1
Paper-button-maker	1
Hawker	1
Steel-toy-maker	1
Umbrella-maker	1
Snuffer-maker	1
No occupation	45

ACUTE AND CHRONIC RHEUMATISM, LUMBAGO, AND SCIATICA.

	Males.		Females.
First quarter	13	First quarter	14
Second quarter	10	Second quarter	14
Third quarter	7	Third quarter	9
Fourth quarter	5	Fourth quarter	3

		For 1835.
These 75 cases are, to the whole number of cases of disease, as	1 to 35,92	1 to 12,97

	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	Total.
Males	1	13	2	10	5	3	1	35
Females	4	11	6	9	5	5	0	40
Total	5	24	8	19	10	8	1	75

MALES.

Smith	1
Labourers	3
Brass-founders	2
Rule-maker	1
Bricklayers	3
Brewers	3
Screw-maker	1
Painter	1
Shoe-maker	1
Buckle-cutter	1
Jeweller	1
Gardeners	2
Market-man	1
Mattress-maker	1

MALES.		FEMALES.	
Snuffer-makers	2	Washer-women	5
Paper-tray-maker	1	Screw-maker	1
Waterman	1	Japanner	1
Coal-heaver	1	Pin-makers	2
Cabinet-maker	1	Sempstress	1
Iron-founder	1	Brass-worker	1
Sawyer	1	Steel-toy-worker	1
Plater	1	Servants	3
Button-maker	1	Burnishing plated wares	1
Coach-harness-maker	1	Button-maker	1
No occupation	2	No occupation	23

CONSTIPATIO.

	Males.	Died.	Females.
First quarter	4	0	27
Second quarter	5	1	28
Third quarter	7	0	17
Fourth quarter	0	0	5
	16	1	77

	For 1835.
These 93 cases of constipation are, to the whole number of cases of disease, as	1 to 28,96 ... 1 to 50,42

	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	Total.
Males	4	1	4	3	1	0	2	1	16
Females	17	23	14	11	9	3	0	0	77
Total	21	24	18	14	10	3	2	1	93

MALES.		FEMALES.	
Bit-maker	1	Burnishing plated-wares	2
Scavenger	1	Servants	3
Gilt-toy-maker	1	Sempstresses	12
Brass-founder	1	Brass-workers	2
Coach-harness-maker	1	Button-makers	4
Labourer	1	Shoe-binders	2
Stirrup-maker	1	Florentine-button-maker	1
Comb-maker	1	Pin-maker	1
Smith	1	Laundress	1
Screw-maker	1	Huckster	1
Sawyer	1	Paper-button-maker	1
Waterman	1	Schoolmistress	1
No occupation	4	Char-woman	1
FEMALES.		Steel-toy-maker	1
Washer-women	6	Brass-nail-maker	1
Screw-makers	3	Paper-maker	1
Brace-makers	2	No occupation	31

In succeeding the late Mr. Parsons as one of the surgeons to the Birmingham Town Infirmary, I feel myself placed in a delicate and difficult situation. His great acquirements, his scientific zeal, his intellectual and professional knowledge, and his kind and urbane manners, all conspired to place him in a lofty and commanding position; the very poor revere his name, whilst the rich alike admire and honour him in his grave. Whatever may be done by a discerning and discriminating public to perpetuate the memory of such a man, will be as nothing compared to what he himself has done. They may erect a monument of marble, but he has erected his own monument in the hearts and affections of the poor under his care. "In him," they say, "they have lost a sincere and true friend." In coming after such a man, I feel extremely diffident, aware of my own deficiencies, and sensible that I cannot do justice to the report which I have presented to you this year, nor give that copiousness and fulness to it which Mr. Parsons furnished in his notes. I have only had access to the documents furnished in his Infirmary book—a barren statement of diseases. From these I have compiled the tables in the report, and have in every respect followed the same plan as Mr. Parsons did in 1835. From his tables I have made my own. In the tables of proportionate mortality I have given, for the sake of comparison, the rate of mortality for 1835, and believing that we should arrive at a truer average of mortality by reviewing a greater number of years, it was my wish to have given the rate of mortality of the six preceding years, but the records

of cases were insufficient for that purpose. It is interesting to know, and tends to prove the correctness of the reports drawn up by the late Mr. Parsons, that the tables of mortality made by him correspond pretty exactly with the tables of mortality of the borough of Birmingham, published by the Committee of Statistics of the Philosophical Institution. In the years 1835 and 1836, two hundred and sixty-nine deaths occurred in Mr. Parsons' infirmary patients, of which number, one hundred and thirty-two, or nearly half, died under the age of ten years. In the borough of Birmingham, from the year 1831 to the year 1836 inclusive, twenty thousand three hundred and eighty-eight deaths occurred; of which number ten thousand four hundred and seventy-eight, a little more than half, died under the age of ten years.

8, Colmore Row,
April 3rd, 1837.

ARTICLE XII.

A REPORT OF CASES

TREATED

AT THE BIRMINGHAM DISPENSARY,

From January 1st, 1837, to January 1st, 1838.

BY T. OGIER WARD, M.D.,

Physician to the Birmingham Dispensary.

Disease.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.	Deaths.
Abortus	0	0	0	0	1	1	0	0	0	1	1	0	4	0
Amenorrhœa ..	1	1	0	1	3	0	0	0	1	4	1	3	15	0
Anasarca	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Anæmia	0	1	0	0	0	1	0	0	0	0	0	0	2	0
Aphonia	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Aphthæ	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Ascites	0	0	0	0	0	0	0	1	0	0	1	0	2	1
Asthenia	0	1	0	0	1	1	0	0	1	0	0	1	5	0
Bronchitis ac.	2	2	8	7	3	1	2	0	1	1	1	1	29	1
..... ch.	3	2	5	6	0	4	0	0	0	3	2	4	29	0
Cephalalgia ...	2	0	0	1	3	2	1	1	0	0	0	0	10	0
Cholera	0	0	0	0	0	0	2	0	0	0	0	0	2	0
Chorea	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Constipatio ...	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Convulsio	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Cutanea	1	1	0	0	1	2	1	1	1	2	0	2	12	0
Cynanche	1	0	0	0	0	1	1	1	0	0	1	0	5	0
Delirium trem.	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Diarrhœa	0	0	0	2	0	0	0	0	0	0	0	1	3	0
Dysmenorrhœa	1	0	0	1	0	0	0	0	0	0	0	0	2	0
Dyspepsia	3	1	0	6	3	2	4	2	0	1	0	1	23	0
Dysuria	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Epilepsia	0	2	0	1	0	1	1	0	1	1	0	0	7	0
Erysipelas.....	0	0	0	1	0	0	0	0	0	1	0	0	2	0
Febris continua	0	0	1	0	1	0	0	4	3	13	0	0	22	3
..... inf. rem.	1	0	0	1	0	0	0	3	0	1	2	0	8	0

Diseases.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sep.	Oct.	Nov.	Dec.	Total.	Deaths.
Gastralgia.....	0	0	0	0	0	0	1	0	1	1	0	1	4	0
Gastritis	2	4	2	2	0	3	1	2	1	0	1	2	20	1
Gastro-enterit.	2	0	0	0	0	1	0	0	0	0	0	0	3	1
Gonorrhœa	1	0	0	0	0	0	1	0	0	0	0	0	2	0
Hepatitis	1	0	0	0	2	3	0	1	0	0	0	0	7	0
Hernia humor.	0	0	0	1	2	0	0	0	0	0	0	0	3	0
Hydrocephalus	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Hysteria	1	0	0	0	0	0	1	1	1	2	0	0	6	0
Icterus	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Influenza	22	18	0	0	0	0	0	0	0	0	0	0	40	0
Incontin. urinæ	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Laryngitis... ..	0	0	1	1	0	0	0	0	0	0	0	1	3	1
Leucorrhœa ...	0	0	0	1	2	2	0	0	0	1	0	0	6	0
Lithiasis	0	0	1	0	1	0	0	0	0	1	0	0	3	0
Mania	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Menorrhagia...	1	0	1	1	0	1	1	0	0	0	0	1	6	0
Morbus	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Nephritis	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Noli me tang.	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Nyctalopia ...	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Palpitatio	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Paralysis	0	0	0	1	0	0	0	0	2	2	0	1	6	0
Peric.&hrt.dis.	3	1	1	1	2	1	0	0	0	2	0	0	11	1
Peritonitis.....	0	0	0	0	0	0	0	0	1	1	0	0	2	2
Pertussis	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Phrenitis	0	0	0	0	0	0	1	0	0	0	0	1	2	2
Phthisis	4	0	3	1	3	5	4	2	1	1	2	3	29	8
Pleuritis	0	0	0	0	0	1	0	0	0	0	1	0	2	0
Pleurodynia ...	1	0	0	0	1	0	1	1	0	3	0	0	7	0
Pneumonia	0	0	1	2	1	1	0	0	0	1	1	1	8	2
Rachialgia.....	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Rheumatismus	4	1	4	8	4	0	1	4	1	1	0	2	30	0
Scarlatina	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Scirrhus.....	0	2	1	0	0	1	0	0	1	0	0	0	5	1
Scorbutus	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Scrofula	0	0	1	4	1	0	0	0	0	0	0	0	6	0
Strictura	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Syphilis	1	2	0	1	0	0	0	0	0	0	0	0	4	0
Trismus	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Tumores	0	1	0	0	0	0	0	1	0	0	0	0	2	0
Variola	0	0	0	0	0	0	0	2	0	0	0	3	5	1
Vermes	0	0	2	4	3	1	3	0	1	1	1	0	16	0
Vertigo	1	0	0	2	0	1	1	1	0	1	1	0	8	0
Total	62	41	36	57	39	41	28	30	19	53	16	31	453	31
Males.....	22	14	9	21	9	14	13	12	6	20	10	7	156	18
Females.....	40	27	27	36	30	27	15	18	13	33	6	24	297	13

The foregoing table has been framed from monthly rather than from trimestral periods, because by this means the effects of change of season in the production and removal of disease are more decidedly marked than by the other arrangement, which, setting out from the 1st of January, necessarily includes a portion of two seasons marked by very different atmospheric phenomena. I have also adhered to the same form as that adopted in my report of last year, not in preference to that excellent one recently recommended to the Society by Dr. Cowan, but for the sake of uniformity with the returns already published, and because my materials in their present imperfect state do not admit of my complying with the propositions of that gentleman.

My last report comprised a period of fifteen months, from September, 1835, to December, 1836, both inclusive; and it is rather remarkable that the number of patients who received relief during the past and the preceding year, is almost exactly the same, viz., in 1836, four hundred and fifty-six, and in 1837, four hundred and fifty-three. The proportion likewise of the sexes is the same in the two years, namely, only one-third males. The ratio of deaths, however, is in favour of the past year, being only one in fifteen, whereas, in the preceding return, it was one in ten, but that is explained by the fatal termination having been reported, although the parties had ceased to be patients of the institution. Of the whole thirty-one deaths, eighteen were males and thirteen females, of which fifteen were below and sixteen above the

age of ten years, one half of the deaths among the latter arising from phthisis. It would be an interesting subject for enquiry, but out of place here, to investigate the reasons why, in the present, and indeed in all the reports which I have examined, the proportion of deaths in males is so much greater than in females, while the cases of disease in females are so much more numerous. Is it that the keener nervous sensibility of the female impels her to seek for medical aid for merely trifling ailments, or is the male more easily prostrated by disease, to which the more elastic female frame yields, but without quitting its hold on life? I have not tabulated the ages of the patients, because to make them completely serviceable, the disease ought to be tabulated also; and this object may be obtained sufficiently well by a remark on the subject in the following observations upon the different diseases, wherever the age appears to exert an influence upon them. I have not been able in a single instance to trace the disease to the occupation of the patient; it has always arisen spontaneously, or from some accidental circumstance. Having premised these general remarks upon the table, we will now proceed to point out such particulars under the head of each disease as may appear worthy of our attention.

In addition to the symptoms of dyspepsia, palpitations, &c., almost every case of amenorrhœa, whether depending upon a plethoric or anæmic state of the system, was attended with more or less headache. In the treatment of this most distressing symptom, I have been guided less by a regard to the constitution of the patients, than by attention to

the effects of the recumbent posture in alleviating or aggravating the pain; such patients as are relieved by lying down being almost invariably benefitted by antispasmodics and tonics, particularly iron; while those who sleep with the head raised, and whose eyes are swelled in the morning, require depletion local and general.

Both the cases of anæmia were attended with palpitations and *bruit de diable.* Since my last report, I have observed this symptom in many cases not only of anæmia, but of general debility, in which it was conjoined with palpitations in women past the menstrual period. I have not met with the *bruit de diable* in a male patient, though this may have arisen from my not having had any cases presented to me that led me to suspect its presence. I perceive that the Committee of the British Association have confirmed my opinion of the venous origin of the sound, though they state that they have noticed it in the arteries also. The only case I have seen that at all supports this view, was one in which the *bruit de diable* was audible in the right external jugular, and over the left carotid or internal jugular, for it appears to be more probable that the sound should be confined in this case to two vessels of the same kind, than that it should be observed at the same time in two vessels of different structure, and acting under different influences. Besides, as the committee have only yet published their conclusions, and not the experiments upon which they were founded, it may be reasonably doubted whether the sound of the venæ comitantes was not in every case the source of the sound heard over the

arteries. In one of the two cases of anæmia, there was a very distinct sound over the brachials, but altogether different from that heard over the external jugular. Upon the causes of this curious sound I have nothing to add to those suggested in the *Medical Gazette.*

One case of ascites was dependent upon enlargement of the spleen, but no examination was allowed after death: the other arose from affection of the heart and liver, dilatation and valvular disease of the former, and probably congestion of the latter.

The majority of the cases of cephalalgia arose from congestion, and were attended with more or less vertigo, the rest depended upon gastric, hysteric, and rheumatic disorders.

The cutaneous complaints were the following:— Three cases of psoriasis, two of erythema nodosum, two of scabies, one of eczema, one of tinea, one of prurigo, and one of a thickly-set bullous eruption on the hands and face, attended with a good deal of fever. One case of psoriasis is still under treatment. The eruption was very general over the body and limbs, and had existed for three years. The patient, a stout woman of 53, had lost her strength and appetite, and lived chiefly on tea, her pulse, however, was rather full and strong, her tongue was furred, and she had thirst, and some headache. The treatment has consisted in venesection to sixteen ounces whenever the pulse gets strong and full, purgatives occasionally, decoction of dulcamara internally, and lead cerate to the scaly parts. She has now, after a treatment of nine months,very little remains of her complaint, and her general health

is very good. No medicine nor internal application has been of service in the case of prurigo, except the sulphur bath. No eruption is visible during the day, at least, I have never been able to see it, but at night her back and the back part of her thighs and legs become red with a minute "rash," as she terms it, which burns and itches intolerably, leaving during the day only a slight scaliness of the cuticle to mark its locality. The complaint has now lasted three years unceasingly. The patient's age is 42, and she has ceased to menstruate.

There was nothing remarkable in the case of delirium tremens, except that it arose after a single debauch in a person not an habitual tippler.

In the last report, the number of fever patients for fifteen months was thirty-two, the disease consisting almost entirely of slight febrile attacks and infantile remittents, none of which were fatal. But in the present report, from a different district of the town, there are three deaths out of a similar number of cases, the character of which, however, was much more severe, two-thirds of them being continued fever. The river Rea, that separates Birmingham from its suburb Badesley, and serves as a "cloaca maxima" to both, carries its filthy stream onward, partly to turn a mill, and partly to fill a mill-pond, while the surplus is carried away over some floodgates by a back stream parallel to a street which it separates from the mill-pond. During the drought that prevailed last year, the water was very low in the main stream and mill-pond, and the mills not being regularly worked, it became quite stagnant and offensive: the back stream also became dry,

and shewed its mud banks, that were only occasionally wetted by a flush of the washings of the town after a shower, or by the small surplus accumulated during the cessation of the mills. The exhalations from the half dried mud and putrid water were so disagreeable at night, as to nauseate the more delicate inhabitants of the adjoining streets, and soon produced disease in the form of typhoid fever of an infectious character. I cannot say how many cases occurred in all, but from what I could learn from other medical men, I should think there must have been not far short of fifty. I had seventeen cases under my own care, thus distributed; in one yard that looked upon the back stream, there were three slight cases in one house, all children; two severe cases in another house, a father and son, the latter of whom died; in the front house at the top of the yard were three children severely, the mother slightly, and a young man fatally affected; another mild case occurred in a child on the opposite side of the street; and a more severe one in another child at a distance along the river side; lastly, there were six cases, five of them most severe and one fatal, all in children, and one mild case in a girl, all in two adjoining houses on the bank of the river. Still lower down the stream, where the water was as black as ink, there were thirteen pauper cases in one yard, and many others, both pauper and private, along the same line. At the other side of the town, round the Soho works, where the same causes existed, fever broke out about the same time, and has continued in a very fatal form, as I understand, up to the present time (Feb. 27th). I have been thus

particular in pointing out what I conceive to have been the sources of the fever, in order to prove that whatever immunity Birmingham enjoys from the usual diseases that infest large towns, it owes to the absence of the ordinary exciting causes; but when these do exist, that the diseases assume the same type that is observed in other places not so favourably circumstanced. One advantage that this town possesses, avowedly great in a moral point of view, and not less so, I should imagine, in its effects upon the physical state of the inhabitants, is, that with very few exceptions, every family occupies a separate house. There is a difference of nearly two hundred feet in the elevation of different parts of the town, the highest points being almost five hundred feet above the mean level of the sea; and the surface is so undulating, that the drainage is excellent in every part. The streets and courts or yards in which the mechanics live are wide and airy in general; fuel is cheaper than in any other large town in England; the water used for drinking and for culinary purposes is excellent, and till within the last year there has been but little distress. Except the pearl and lead works, there are very few injurious occupations extensively carried on in Birmingham.

But to return from this digression, the type of the fever was that of typhus mitior of Cullen, or the *affection typhoide* of Louis and Chomel, the most urgent symptoms being cough and diarrhœa, particularly the former. Of the seventeen cases above mentioned, eleven were below the age of twelve. The three fatal ones were a young man

aged 23, a boy aged 11, and a child $1\frac{1}{2}$, all of whom exhibited exactly the same lesions after death, viz., extreme congestion of the lungs, with here and there portions of red hepatization, the whole of the affected parts being softened; the bronchi red, thickened, and filled with thick mucus; the mucous membrane of the stomach injected, thickened, and softened; the same appearances in the duodenum of the two elder, with great development of the mucous follicles; the glands of Peyer prominent, and covered with sloughing ulcers, particularly at the cæcal valve; the mesenteric glands opposite the ulcerations much enlarged; the glands of Brunner enlarged and ulcerated; and the rest of the viscera healthy, but congested, except the spleen, which was softened also.

The influenza prevailed very extensively in this town and neighbourhood during the months of January and February; and in part of March a few cases were observed. Its peculiarities have been so frequently described, and every practitioner must have seen so much of it, that I think it needless to give any account of its usual symptoms. I may remark, however, that it was observed by others as well as by myself, that other diseases during its prevalence assumed an asthenic character, and that the patients were unable to bear the depleting measures usually prescribed.

As there was some obscurity as to the exact nature of the following case, I thought it right to give the patient a chance of benefit from the operation of tracheotomy, which certainly prolonged her life, though the result was such as scarcely to

encourage a repetition of the operation where the symptoms are more decided.

Mary Darby, æt. 12, schoolgirl, March 29th.—Had been unwell with sore throat for a day or two, but was able to enjoy herself, and go out the previous day. During the night she was poorly, and at six A.M. dyspnœa came on so rapidly that by eleven o'clock she had lost her voice; her respiration was wheezing, though with but little difference in the length of the inspirations and expirations. I found her at half-past two P.M. with her breathing as above described, except that, having just been sick, expiration was occasionally interrupted by hiccough, face anxious, pulse rapid and weak, no cough while I staid, tongue clean, bowels open. Being in doubt whether it was a case of croup or of ædema of the glottis, I ordered an emetic, and eight leeches to the larynx.

Half-past six P.M.: No relief; on the contrary, she was evidently dying. I therefore hastened to bring my colleagues, Messrs. Amphlett and Crompton, who performed tracheotomy. Sensibility was already gone, but she rallied again immediately that the tube was introduced. A sudden effort, however, forcing it out before it could be properly secured, and some blood getting into the trachea at the same moment, after a few struggles, respiration ceased, and the pulse at the wrist could no longer be felt. The tube being replaced, I blew down it, while water was dashed on her face, and the chest was pressed at intervals, when at length a deep inspiration took place, followed by another and another at shorter intervals, till the respiration was

re-established. With my hand on the wrist, I remarked that the pulse, which was small and rapid, intermitted at each inspiration. She was replaced in bed, and I sat up with her. During the night she was usually calm and comfortable, and took a great deal of milk, but the tube frequently became obstructed with blood and mucus; and whenever this occurred, it produced a suffocative cough, coldness of surface, and increased rapidity and weakness of pulse. These attacks became more frequent during the next day, and she died at five P.M. in a state of coma.

S. C. twenty hours after death.—The lungs and brain were congested, and there was effusion into the ventricles; the blood was semifluid; a false membrane, firm and adherent above, loose and soft below, lined the larynx and trachea as far as the secondary divisions of the bronchi; the part lining the larynx was black with carbonaceous matter; the mucous membrane was pale beneath the adherent lymph, but very red where it did not adhere, and also along the bronchi. During the dissection some pus flowed out of the trachea. The other viscera were all healthy.

The following case of peritonitis from perforation of the intestines is remarkable for the length of time, above five weeks, that elapsed between the first symptoms of the intestines having given way, and the fatal termination of the case.

Oct. 4th, Wm. Harper, æt. 15.—On August 17th he felt unwell, with headache, sore throat, and dyspnœa, for which he took no remedies till the 24th, when he applied at the General Hospital, and re-

ceived a gargle and two aperient powders. He took one, but without relief from its effects; and the next day he went out in the rain, and feeling worse the day after (the 26th), he took the other powder, which did not purge him: and soon afterwards he complained of a fixed violent pain in the right side of his belly, which rapidly extended, while that part of his abdomen became exquisitely tender. After remaining in this state for two days, he was seen by a surgeon, who gave him an aperient, as his bowels had not yet been opened, but without effect; and the next day he applied sixteen leeches to the bowels, by which he was much relieved. He continued to improve for three days, when on Sept. 2nd all his symptoms returned with violence, and from that time till his death, Oct. 3rd, they continued with very little variation. These symptoms were, constant pain and tenderness of the abdomen, particularly on the right side, aggravated by occasional spasms, fever, frequent vomiting, constipation, tympanitis, and rapid emaciation. He was not confined to his bed, but usually sat doubled up on a chair, as that position gave him most ease; and he was able to go down stairs the day before his death. The headache ceased on the first attack of the pain, and never returned. I gleaned these particulars from his mother, as she only applied at the Dispensary the day before he died, and I did not see him alive.

S C. twenty hours after death.—Extreme emaciation, abdomen already green, and distended with gas that filled the house with an intolerable fœtor. Omentum adhering slightly to the peritoneum and to

the bowels by long semi-transparent but not strong bands of lymph. Fœcal matter lay upon the bowels just above the pubes, and upon raising the omentum, the intestines were seen adhering together in a mass, and to the peritoneum on the sides of the abdomen as well as to the omentum. On separating the colon from its adhesions, about a quart of fœcal matter was found lying between it and the parietes on each side, the cavities being lined with lymph of considerable thickness, and not very recent. Many ulcers with elevated edges everted externally, and penetrating its cavity, were seen on the colon. The stomach and bowels were removed and laid open. The former was injected, and its mucous membrane was softened, but that of the intestines was healthy throughout, excepting in places opposite to the external ulcers, where it was softened and perforated, forming a thin floating edge or fringe to the ulcers, but with the exception of one instance, where the perforation was two inches long by one inch and a half wide, it was as tough as natural round the ulcers; here, however, it was injected and pulpy. There were four perforations in the right colon, varying in size from the largest just mentioned to half an inch in diameter, all having thickened or everted edges towards the peritoneal surface; and, besides these, there were several others laid open by the scissors in running them along the bowels. The solitary glands of the colon were enlarged, but not ulcerated. Peyer's glands were very distinct, and were spotted with black dots, but were not ulcerated in any part. The mucous glands of the vermiform process were much enlarged; and

the process itself was almost divided in two parts by ulceration at about an inch and a half from its extremity. It was separated with difficulty from the matted mass of intestines. The liver and kidnies were healthy, and there were no tubercles in the lungs. Mesenteric glands much enlarged, as in typhus, but they contained neither pus nor tubercular matter.

From the history of this case, and from the absence of any recent lymph in the abdomen, it appears to me there can be but little doubt that a perforation of the intestine existed at the time of the first attack of abdominal pain. The preceding indisposition may have been continued fever, and this idea is supported by the state of the mesenteric glands; but if it were not so, we must look to the effects of the purgative powders. The first acted freely, and two days afterwards the patient took the other, when in a few hours the pain came on in the right iliac region. At this time, I conceive, the vermiform process, previously ulcerated and irritated by the purgatives, gave way, and its contents passed into the abdomen, but not in sufficient quantity to produce very violent peritonitis. Such a case I have seen, where the patient lived for a week. The Peyerean glands, the usual seat of ulcers, being sound, and the bottom of the ulcers being formed by the mucous membrane, elsewhere healthy, clearly indicate that the ulcers began on the peritoneal surface of the intestines, excited, I imagine, by the fæcal matter that had escaped from the vermiform process. I suggest this explanation of this interesting case, not being able upon any other sup-

position to trace the connexion between the symptoms and lesions.

The cases of hooping cough occurred in the same yard and at the same time, with the worst fever cases, and proved fatal from the same cause—intense congestion of the lungs; but whether the malaria had any influence upon them, I cannot say, though I think it probably had.

The *post mortem* appearances presented by the following case are interesting, from the early age of the subject.

Jane Morris, æt. $1\frac{1}{2}$.—Only four teeth; cough for four months; diarrhœa for a month, without pain or tenesmus; stools white; acute hydrocephalus two days before death, without paralysis. Pia mater congested; serum in ventricles; lungs, liver, and spleen, full of miliary tubercles, and some also in kidnies; tubercle in sand-like grains in bronchial and mesenteric glands, which were enlarged; right lung contained most tubercles, and had cavities in its upper part. Hepatic tubercles in the centre of the lobuli of Kiernan; spleen enlarged; tubercles, but no ulcers, under mucus membrane of intestines; gall bladder full of green bile; liver pale, hard, and fatty.

One of the pneumonic patients died of gangrene of the lung above a fortnight after his sputa had become intolerably fœtid. The disease was seated in the upper part of the left lung, and there were no tubercles. The other case was complicated with meningitis, and was very rapid in its course. The upper lobe of the right lung was quite broken down and pulpy, but there was no gangrenous smell.

The case I have entitled scorbutus presented the following symptoms :—Purpuric spots on the legs of some months' duration, spongy and bleeding gums, and tumid belly, followed by general anasarca and symptoms of dilated heart. After death the heart was found to be dilated; there was serum in all the cavities; the mesenteric glands were much enlarged, and the blood was remarkably serous. The patient, a boy, was aged eight years. I have at this moment a similar case under my care, except that there is no purpura.

The origin of the case of trismus was very obscure, but I attributed it to cold and wet. The patient, a labouring man, æt. 48, first complained of tension across the chest, attended with flatulence and stiffness of his jaws, which became closed in the course of a week, at which time he was hardly able to stand from loss of power in his limbs, with great pain in them, nor to lie down for fear of suffocation. In a few days tremulous tetanic spasms came on, and continued at intervals throughout his illness with greater or less violence ; neither purging, nor a slight salivation, nor opiates, having been of service, though a blister between the shoulders relaxed the jaws sufficiently to allow him to put out his tongue. I determined to try turpentine, particularly as he objected to another blister, not only from the pain of the former, which was still open, but because he thought it increased the spasms. I was induced to try the turpentine from having seen it recommended in the *Medical Gazette*, and also from the consideration that its irritating effects on the urinary organs bore some analogy to the action of

a remedy in use in such cases, according to Mariner, among the natives of the Tonga Islands, viz., thrusting a rough stick down the urethra, so as to produce a considerable flow of blood. I gave the turpentine in doses of fifteen drops, in a mucilaginous mixture, thrice a day, but continued the opiates. He was very sick the day before, and for two days after taking it, as it increased the sickness. The matter vomited was very dark, and the medicine had no particular effect upon the kidnies; but from this time he gradually improved, the spasms becoming weaker and less frequent, and in ten days they completely subsided, and his jaws were almost relaxed. I then omitted the turpentine, and gave him small doses of nux vomica in powder, which seemed to hasten his recovery very rapidly.

ARTICLE XIII.

A

REPORT OF THE CASES

ATTENDED DURING THE YEAR 1837,

BY R. MIDDLEMORE, ESQ.,

Surgeon to the Birmingham Eye Infirmary.

Simple acute conjunctivitis, 78. Chronic conjunctivitis, 39. Acute conjunctivitis, with pustule or ulcer on the cornea or conjunctiva, 83. Acute conjunctivitis, with puriform secretion, 34. Purulent conjunctivitis of new-born infants, 19. Irritable conjunctivitis, 36. Strumous conjunctivitis, 62. Erysipelatous conjunctivitis, 7. Effusion of various kinds beneath the conjunctiva, 8. Disease of the semilunar membrane and lachrymal caruncle, 3. Corneitis, 31. Vascularity of the cornea, 6. Pannus, 3. Opacity of the cornea, 43. Staphyloma of different kinds and of various parts, 13. Ossification in various parts of the eye-ball, 4. Impaction of foreign bodies in the cornea conjunctiva and sclerotica, and within the globe, 34. Inflammation of the membrane of the aqueous humour, 17. Sclerotitis, 16. Pterygium, 4. Simple acute iritis, with or without ulcer of the cornea, onyx, or hypopium, 37. Chronic iritis, 6. Syphilitic iritis, 5. Strumous iritis, 11. Vacillation of the iris, 4. Closed pupil, 3. Inflammation of the ciliary processes, 2.

Choroiditis, 5. Varicose ophthalmia, 7. Retinitis, 8. Cataract, 17. Glaucoma, 9. Fungoid and other tumours within and upon the surface of the eye-ball, 5. Proptosis, 4. Suppuration of the eye-ball, 5. Neuralgia of the eye-ball, 4. Amaurosis of various kinds and in different degrees, 34. Myopia, 6. Presbyopia, 9. Diseases of the lachrymal apparatus, 15. Strabismus, 10. Ophthalmia tarsi, 33. Lippitudo, 9. Hordeolum, 7. Ectropium, 5. Entropium, 11. Inflammation of the eye-lids, 5. Ptosis, 2. Ulceration of the eye-lids, 2. Tumours in the eye-lids, 12 Wounds of the eye and its appendages, 33. Symblepharon, 3. Congenital malformations of the eye and eye-lids, 4.

OSSIFICATION OF THE CRYSTALLINE CAPSULE.

Mary Larkin, æt. 60, the wife of a publican residing near Sutton, received a blow upon the right eye about eight years ago, which deprived the organ of sight, but did not leave behind any manifest defect of any other description. About six months since she complained of great pain in the eye, and, on examination of the part by her surgeon, Mr. Oates, of Sutton, the lens, surrounded by an ossified capsule, was found to be dislocated.

Nov. 1, 1837.—She complains of intense pain above the eye-brow, upon the cheek bone, and towards the nose. The forehead is acutely painful, and also the back of the head on the affected side. This intense hemicrania, or darting pain from the fore to the back part of the head, is usually complained of in those instances where ossification of any of the textures of the eye has begun to produce active irritation.

Appearance of the Eye.—There is a slight zonular arrangement of vessels around the cornea, which is occasionally much increased, and it is manifest that she has suffered for some weeks past from chronic iritis. Immediately behind the cornea there is a globular body obviously covered by a white membrane, interspersed with dense yellowish-white spots; the iris is pressed backwards by the presence of this body in the anterior chamber: it was evidently the lens within the anterior chamber and surrounded by its capsule, the anterior hemisphere of which was converted into bone, but being more perfectly ossified at one part than another, the mottled and irregularly and densely dotted appearance I have mentioned was perceived. I scarcely know how to describe these appearances, but a person who has once seen them, has no difficulty in recognizing them when presented to his notice a second time. The removal of the ossified part was proposed and acceded to.

Operation.—November 18, 1838.—Assisted by my friend Mr. Willcox, I made a section as for extraction at the lower part of the cornea, and, with little difficulty, removed an ossified capsule, which is now among my preparations. The lens was of an amber colour, and was not very opaque; the posterior capsule was scarcely thicker than usual, and nearly transparent, but the anterior hemisphere of the capsule was almost entirely converted into a smooth plate of bone, except near the margin of the union between the anterior and posterior hemispheres of the capsule, where it constitutes a rugged ring of bone.

Treatment.—The lids were carefully closed after the operation, and a narrow bandage was lightly passed over them. The patient was directed to lie in bed, and to have her apartment darkened; a little aperient medicine was administered, and the diet was lowered. By these means, perseveringly adopted for about a week, the patient was enabled to return home, and in about a fortnight afterwards she called upon me, when the following was the condition of the eye:—Nearly free from inflammation; pupil clear, but slightly drawn towards the incision of the cornea. The cornea is in no degree staphylomatous, and the wound inflicted at the time of the operation has healed very perfectly. The sight of the eye is entirely destroyed.

TREATMENT OF STAPHYLOMA OF THE CORNEA.

James Shephard, æt. 24, sustained a severe injury to the face some months ago, which produced collapse of the right, and occasioned the following condition of the left eye:—Two-thirds of the cornea at its lower part has become prominently staphylomatous; the pupil is closed, and the iris is adherent to the upper part of the staphyloma. The eye-ball is a good deal inflamed. The objects it was desirable to accomplish in this case were, first, to lessen the size of the staphyloma; second, to remove the ophthalmia; and third, to form an artificial pupil.

As one-fourth of the cornea, and a corresponding portion of the iris were healthy, it was, I repeat, desirable to make an effort to form an artificial pupil; but, of course, before this was attempted, it

was necessary to cure the staphylomatous projection by some method which would not endanger the occurrence of atrophy of the eye-ball. The use of the seton was improper on account of its great liability to produce a degree of inflammation adequate to affect injuriously the corneal or irital texture; and the removal of the projecting part by ligature or the knife was improper, by reason of their direct tendency to cause collapse of the eye-ball. The repeated tapping of the part, by means of a fine iris-knife, was not open to this objection, and, although a mode of treatment not generally to be recommended for the treatment of staphyloma, was in this instance adopted, and with perfect success; so that this person's eye is now in a fit state to be operated upon for artificial pupil.

In all cases of partial staphyloma of the cornea where it is desired to leave the eye in a condition to permit the formation of an artificial pupil, in all instances where it is specially important to avoid the displacement of the lens, and the risk of producing atrophy of the globe, the operation of tapping is to be preferred, but, on account of its tediousness, and its frequent inadequacy, it is not adapted to the cure of the large and extensive variety of staphyloma, or, indeed, of any form of staphyloma the walls of which are much thickened. These last varieties of staphyloma are best treated by the removal of a small portion of the most prominent and attenuated part, as formerly explained;* but, instead of using Beer's extraction knife, I now

* See my remarks upon this subject in the second and third volumes of the *Transactions*.

prefer to employ one the blade of which resembles the ace of spades, only narrow in proportion to its length, and having a cutting edge on either side—a sort of double Beer's knife, one edge of which when the point is introduced within the cornea, is opposed to its upper, and the other to its lower margin.

FISTULOUS OPENING COMMUNICATING WITH THE ANTERIOR CHAMBER.

Mary Elwell received a blow from a cork, which was forcibly projected against the eye. In a few days after the accident she called upon me: there was a small, nearly transparent, tumour just without the margin of the cornea, which contained a small quantity of aqueous fluid. On its removal, by a minute opening made with the point of a fine needle, it soon reappeared, and the iris appeared somewhat narrower on the side of this little vesicular enlargement. No astringents I could use had the effect of causing its contraction, and, on opening it with a small needle, it soon filled again; had I used a large one, I might have produced prolapse of the iris, or have established a fistulous opening, through which the aqueous fluid would have constantly flowed. Subsequently I applied the nitrate of silver to the part. The small swelling gradually diminished, and has not since reappeared.

This description of tumour sometimes occurs after a small but penetrating wound at the corneo-sclerotic junction, and may either be produced by the protrusion of the membrane of the aqueous humour,

or, as in this instance, by the passage of a minute portion of the aqueous humour beneath the conjunctiva. The application of the nitrate of silver to the part, after the evacuation of its contents, is usually adequate to its cure.

DISLOCATION OF THE LENS THROUGH A RENT IN THE SCLEROTICA, BENEATH THE CONJUNCTIVA.

Wm. Manton, æt. 21, a labourer, received an injury of the right eye from a cow's horn. The left eye was lost in infancy, from small-pox. Soon after the occurrence of the accident, he was attended by Mr. Cook, and subsequently by Dr. Arrowsmith of Coventry.* When he first came under my care, four months had elapsed since the date of the injury. The eye was in the following condition:—The cornea was slightly nebulous, and somewhat conical; the anterior chamber enormously large (almost amounting to dropsy of that part); the iris was wanting at its superior part, so that the pupil resembled that of an eye in which the upper section has been made for the extraction of cataract, the surgeon having shaved off a portion of the iris in making the incision; and there was a blue mark just behind the corneo-sclerotic junction, shewing that the sclerotica, perhaps, also, the conjunctiva, but I am not sure of this, had been ruptured at that part.

* Dr. Arrowsmith has been so good as to furnish me with an account of the appearance of Manton's eye when he first examined it, and my impression is, that our opinions differ in some degree respecting the nature of the case; but I am sorry to state that I have lost the letter he sent me when I applied to him for an account of the symptoms existing three weeks after the injury.

This man can see moderately well without spectacles, but his sight is not much improved by the use of double convex glasses, which, I presume, is chiefly owing to the increased convexity of the cornea and amplitude of the anterior chamber, by which the tendency to far-sightedness, occasioned by the loss of the lens, is in a great measure corrected.

The form of dislocation of the lens from which Manton suffered, is by no means one of frequent occurrence. It has fallen to my lot to see two instances in which the lens has passed through a rent in the sclerotica, and lodged near the corneal margin and beneath the conjunctiva. These cases came under my observation when only a very small tumour was visible, which I supposed, in both instances, to be the remains of the displaced crystalline. Although the patients suffered extreme pain for some time after the accident took place, they eventually recovered a very useful degree of vision, notwithstanding the omission, on the part of their surgeon, to remove the lens by a division of the conjunctiva. Sometimes the lens will not only pass through the sclerotica, but through the conjunctiva also, by the laceration of both membranes at the same time, and yet the patient's vision will be moderately good when assisted by the ordinary cataract glasses; but this, of course, is neither a common accident, nor the customary termination of it when it does take place.

To conclude my remarks on this interesting case:—whenever a convex tumour of considerable size and covered by the unbroken conjunctiva, forms

near the corneo-sclerotic junction soon after an injury to the eye-ball, it is almost sure to consist of either effused serum or blood, or to be the displaced lens. The means of determining to which of these causes the enlargement is owing are, for the most part, abundant and manifest, and if the swelling be ascertained to arise from the presence of the lens, the rule for the guidance of our practice is absolute; the displaced crystalline must be at once removed by a division of the conjunctiva.

WOUND OF THE CORNEA AND DISLOCATION OF THE LENS.

James Simcox, æt. 12, on the fifth of November, was engaged in firing off a cannon, when some portion of its contents struck his left eye. He came to me on the following day. The eye was then a good deal inflamed, the lens was partly pushed through and partly fixed within the pupil; fragments of it were also noticed at the bottom of the anterior chamber. The cornea was very slightly wounded. He suffered a good deal of pain, although the eye was not acutely inflamed.

Treatment.—Mercury to be administered so as to affect the mouth slightly. Belladonna to be applied daily over the eye-brow. Flannels soaked in strong narcotic lotions to be applied to the eye-lids, and six leeches to be placed behind the ear.

Result.—In about a month, the lens being absorbed, the appearance of the eye was so perfect that it would be difficult to determine that it had ever been the seat of an accident. The sight recovered as after an operation for extraction of cataract.

I relate this case (one of a series I am engaged in arranging) to illustrate the propriety of omitting the performance of a surgical operation, in many instances where the lens, not covered by its capsule, is dislocated by accident. I have tried both plans pretty extensively, and am assured that the removal of the lens may be generally dispensed with, with great advantage as regards the result, and with that important advantage as relates to the patient, which no humane surgeon should ever lose sight of—that of avoiding the infliction of unnecessary pain. The removal, through an incision of the cornea, of a lens displaced by a severe accident, when the eye has become, as it soon will do, inflamed and intolerant of light, *always* occasions severe pain, and, *in some instances*, a degree of agony, which the fortitude of a martyr can barely sustain.

CHRONIC INFLAMMATION OF THE ORBITAL CELLULAR MEMBRANE.

Joseph Hope, æt. 22, complained of pain in the head, throbbing in the orbit, and a feeling as though the eye-ball was being extended from its socket. The eye, on careful examination, was found to be slightly protruded, but there was no sense of pulsation conveyed to the finger, nor any appearance of infiltration of the orbital cellular membrane. The young man says he has received no blow or other injury to the eye. He considers it to be occasioned by being out late on a cold damp evening.

The complaint continued to increase, the eye became more and more protruded, the whole orbital

contents became vastly increased, he suffered from dreadful hemicrania, from feverishness, and from general derangement of the health. At this time he applied at the Town Infirmary, at which institution he was attended by Mr. Gem; and when he called upon me after he had left the Infirmary, his eye was nearly as usual, except that the lids were slightly puffy and œdematous.

The treatment employed by me during the time the patient was under my care, was founded on the supposition that he was suffering from chronic inflammation of the orbital cellular membrane, producing serous infiltration of that tissue. The illness for which he was attended by Mr. Gem did not appear to be connected with the state of the orbit. At one period of his illness, the severity of the pain, the increasing protrusion of the globe, the sense of tension of the eye-ball, and of stretching of the parts behind it, made it a matter of serious reflexion how far the patient was suffering from the development of a tumour within the orbit. Of course the symptoms were manifestly different from those proceeding from inflammation of the periosteal lining of the orbit.

EMPLOYMENT OF VARIOUS REMEDIES FOR THE RELIEF OF AMAUROSIS.

Veratrine and Aconitine Ointment.—These unguents have been so much talked of, that I have thought it proper to give them a trial. I will briefly explain the results of their employment. In only one example of amaurosis, out of eight subjected to the treatment, have I derived the slightest benefit,

namely, in the case of a soldier suffering from dimness of vision, which, however, was not so great as to prevent him from walking with tolerable ease about the streets of this town, and managing the sale of vegetables at home. The pupil of his eye was rather large and sluggish, and there was just that sort of muddy (occasionally approaching to resplendent when viewed in a particular light) green appearance within the eye, which is noticed where chronic inflammation of the septa of the hyaloid membrane has induced a slightly turbid condition of the vitreous fluid. The pupil (and this is a very common effect of these applications) became smaller and more active, and he thinks his sight considerably improved. After discontinuing the remedy, his sight was very little better than it was before he used it. In some cases of neuralagia of the eyeball, I have prescribed these ointments with unequivocal advantage.

The ointment is prepared by mixing four grains of aconitine or veratrine with half an ounce of lard.

Mode of using the Ointment.—A quantity, the size of a *small* nut, to be rubbed above the eye-brow by means of a bit of sponge attached to a convenient handle, until the skin begins to smart and feel very hot. The *rubbing* to be practised daily.

Use of the Nitrate of Silver.—The application of a finely-pointed piece of nitrate of silver to the margin of the cornea in certain forms of amaurosis has been advised by various surgeons. Some years ago I tried this plan of treatment, but not finding it serviceable to the extent I expected, discontinued

to employ it; but, finding it lately recommended by Lisfranc, and that recommendation supported by the relation of a number of cases* in which it had proved serviceable, I felt that it was due to so distinguished an authority to carry his suggestion into effect. The following is one of the cases in which this method of management has been tried.

Case.—William Earp, æt. 12, residing at Atherstone, was brought to me by my friend Mr. Ward. The little patient had suffered from an attack of fever, nearly two years ago, since which time he has been blind, although in every other respect he is perfectly recovered.

State of the Eyes.—Pupil large, clear, and immoveable; there is no inflammation present, and his eyes are not painful. With the right eye he can just discern the degrees of light, with the other he has not the slightest perception of light. This eye was selected for our treatment, and Mr. Ward was good enough to use the remedy at the boy's residence. After the nitrate of silver had been applied four times, at suitable intervals, Mr. Ward brought the child to me again, when the vision of the eye (formerly entirely dark) was sufficiently restored to enable him to distinguish colours, and to make out large and conspicuous objects. The pupil is smaller than it was, and the iris is more active. The use of the remedy and the improvement of vision are now progressing, though slowly. In one or two instances in which I have employed the nitrate of silver, a troublesome form of ophthalmia

* *The Continental and British Medical Review.* No. iii. (for May, 1837.) Edited by A. M. Bureaud Riofrey, M.D.

has occurred afterwards, but, inasmuch as most of the cases in which the nitrate of silver are admissible and advisable, are those in which there is an anæmic and atonic condition of the ocular tunics, and of the vascular system of the eye generally, this occurrence is very rare, and has always been, under my own observation, quite manageable.

Mode of using the Nitrate of Silver.—Having a portion of nitrate of silver worked to a delicate point, I touch the cornea near its junction with the sclerotica so slightly as merely to produce a small eschar, on the detachment of which a minute, superficial, and perfectly healthy ulcer remains, which very readily heals and becomes imperceptible, and this I do at about four points, which are comprised within the half of the cornea.

Use of Strychnia.—I must not omit to mention that in two instances of amaurosis occurring in my private practice, I have, after the failure of other methods, placed a blister in front of the ear, and applied to the raw surface left after its removal a small quantity of strychnia, and that its use has been followed by the most satisfactory results; satisfactory, indeed, when it is considered that this method of management was tried after all the measures previously employed had failed to relieve.

SCROFULOUS DEPOSITION WITHIN THE EYE-BALL RESEMBLING MALIGNANT DISEASE.

George Lord, æt. 6, first came to the Eye Infirmary July 6, 1838. He is of a fair complexion, has light hair, a thin transparent skin, a delicately tinted cheek, and is, what is termed, a precocious child.

The parents of the boy have both a light complexion, and possess the same constitutional characters as their child, but they appear to be healthy, and have other children who are strong and hearty. They can give no account of the cause and origin of the complaint in their child's eye, and are sure that he has received no severe blow upon the part.

Left Eye.—Slight intolerance of light, but otherwise healthy.

Right Eye.—Cornea nebulous, and slightly uneven, as in some cases of corneitis. Iris almost in contact with the cornea, and interspersed with large red vessels, which appear to connect it with the cornea through the medium of lymph which is deposited throughout its texture, and in patches upon its surface. Its structure is as though it had been macerated, and is otherwise changed. The pupil is not distinguishable. The conjunctiva is tumid, many very large vessels exist in its texture, and in that of the sclerotica. At the upper and also at the nasal side of the eye-ball, a whitish prominence may be noticed, as though matter had been deposited within the globe, had ruptured the sclerotica, and had pushed before it the extensible conjunctiva. The patient is the subject of severe pain from, apparently, tension of the globe. Conceiving the child to be suffering from scrofulous deposition within the eye-ball, I adopted every measure calculated to sooth his present uneasiness, and intended to open the longer of the tumours on the following day.

July 8.—The tumour has given way, and there is now exposed a dirty, whitish, and fibrous-looking substance, a good deal resembling the solid curdy

portion of the contents of a common scrofulous abscess. This matter may be pealed and pulled away by the forceps. One or two similar tumours have just appeared at other parts of the surface of the eye, but they are extremely minute. The general aspect of the eye is dreadful, and would formerly have been considered to furnish a decided example of malignant disease, and would doubtless have been removed by a surgical operation.

In the progress of this case, the details of which it is not necessary to furnish, the resemblance to malignant disease was so great, that several medical friends to whom I shewed the case had very little doubt upon the point. My own opinion, however, was, that the disease constituted a very rare form of ophthalmic disease, namely, chronic deposition of curdy, scrofulous matter within the eye-ball and beneath the conjunctiva; this deposition being rather more solid and tenacious than that usually resulting from strumous action. In this opinion my excellent friend Dr. Julius Staberoh* agreed.

Treatment.—A grain of disulphate of quina to be taken three times a day, and every evening one grain of blue pill and three of the extract of conium.

Local Treatment.—Flannels wetted with the following lotion to be frequently applied in a warm state to the eye:—℞ *Extracti belladonnæ* ʒj., *extracti hyoscyami* ℈ij., *decocti papaveris* ℥vss., *vini opii* ℥ss. m.; and whenever the pain was more than

* This enthusiastic student of our interesting profession has now returned to Germany, and promises to confer honour on the country and the profession to which he belongs.

usually severe, a grain of opium mixed with half a drachm of mercurial ointment, to be well rubbed immediately over the eye-brow.

Result of the Case.—An organised deposition coated the ulcerated parts left on the discharge (which gradually took place) of the curdy pus, and the eye-ball became somewhat diminished; the mottled organised matter deposited within the globe, and so mixed up with the iris as to render its texture scarcely distinguishable, still remains.

My former reports contain an account of cases in which the eye-ball was the seat of disease so closely resembling malignant affection, that it required the greatest possible attention to arrive at an accurate diagnosis. But having already directed attention to the means of distinguishing the anomalous depositions within, upon, and beneath the eye-ball, and which are not malignant,* from the class of intractable maladies usually termed cancerous, fungoid, hæmatoid, melanotic, &c., I shall not lengthen my present remarks by referring to the subject in detail.

In my last Report† I related the case of George Southall, in whose right eye many of the appearances of malignant disease were present. I have seen this lad during the last fortnight, and, in confirmation of the opinion formerly given, I may mention that his eye continues as nearly as possible in the same state as when I first published an account of it.

* See my *Treatise on the Diseases of the Eye.* Vol. ii., pp. 412, 465.
† Vol. v., p. 399.

MELANOTIC GROWTH FROM THE SEMILUNAR MEMBRANE.

In the last volume of the *Transactions,** I related a case under the above title, and explained the characters of the growth as they were noticed on attentive examination after its removal. I have carefully examined the patient's eye this day (February 28, 1838); it is very slightly inflamed; two exceedingly minute black spots exist near the lachrymal caruncle, but she says they are not longer than they were six months ago. There is a small black spot about the centre of the cheek, and a considerable enlargement and induration beneath the jaw on the same side, the skin covering which is perfectly healthy. The woman is in pretty good health, and seldom feels pain in the swelling except when "she takes cold."

* Page 395.

ARTICLE XIV.

STATISTICAL ACCOUNT

OF THE

IN-PATIENTS

OF THE

MEDICAL WARDS IN THE GENEVA HOSPITAL,

FOR THE YEARS 1834, 1835, AND 1836;

TO WHICH ARE ADDED

DOCUMENTS RELATIVE TO THE INFLUENCE OF THE SEASONS

ON THE

DEVELOPMENT OF CERTAIN DISEASES

AMONGST

THE POORER CLASSES OF GENEVA AND ITS ENVIRONS.

BY H. C. LOMBARD, MD.,

Physician to the Civil and Military Hospital of Geneva.

THE Geneva Hospital is situated on the summit of a hill of some elevation, on the margin of the lake, and hence its northern aspect has the advantage of a pure and constantly renewed air. The medical wards receive the light and air from both sides, and as the length of the building runs in a direction from north to south, it receives the great currents of air which pass down the valley of the lake of Geneva. This circumstance has considerable influence on the salubrity of the wards, the air of which is never sufficiently renewed when the openings of the extremities are not in the direction of the ordinary winds. The medical wards have two large windows, and a square aperture situated on a level with the ground, so that complete ventilation is not only possible, but, to a certain extent, in-

evitable. It is probably to all these circumstances, as well as to the extreme cleanliness which is maintained in them, that we must attribute the salubrity of these wards, as compared with other parts of the same building. In the centre of each ward is a stove, which, during the cold season, is heated twice every twenty-four hours; a fixed temperature of from 12° to 15°, Reaumur, is thus kept up throughout the entire ward. A *minimum* thermometer marks the fall of the temperature during the night. Each ward contains fourteen beds; supposing, therefore, that all the beds are occupied, the volume of air for each patient will be $4\frac{2}{3}$ cubic toises. This average is higher than that of many Hospitals, but it is lower than that of some of the Parisian Hospitals, and it is probable that we shall extend it, by diminishing the number of beds, as soon as the building of other wards, now in contemplation, will enable us.

The admissions into the medical wards during the years 1834, 1835, and 1836, amount to 1405; of which 1015 were males, and 390 females. The following table shews the numbers admitted in each month:—

	Men.	Women.	Total.	Months of 31 days each.
January	83	48	131	131
February	85	35	120	133
March	83	24	107	107
April	98	35	133	137
May	86	28	114	114
June	77	24	101	104
July	98	46	144	144
August	88	33	121	121
September	83	33	116	120
October	69	23	92	92
November	89	26	115	119
December	76	35	111	111
Total	1015	390	1405	

This table shews that the admissions were most numerous in the months of July, April, February, January, August, and September. The months in which the sick were most numerous are those which come nearest to the above series—November, May, December, March, June, and October. A comparison of the seasons gives the following result, taking the winter, as we shall do throughout this paper, to include December, January, and February; the spring, March, April, and May; the summer, June, July, and August; and the autumn, September, October, and November.

	Admissions.
Winter	362
Spring	354
Summer	366
Autumn	323

The sick, therefore, are most numerous in summer; next in frequency comes the winter; then the spring; and lastly, the autumn. The differences, however, are not considerable, with the exception of autumn, in which the number is much smaller than in any other season.

The ages of these patients are set down in the following table, the total of which, 1389, it will be observed, differs from that of 1405, the amount of admissions in the former table; this difference is produced by counting twice over a number of patients remaining on the 31st of December, in the total of those admitted during the year. This remark applies also to the different comparisons of the table of diseases, and to the tables shewing the influence of the seasons on their development.

	Patients.
From 0 to 10 years	20
From 10 to 20 years	100
From 20 to 30 years	503
From 30 to 40 years	280
From 40 to 50 years	186
From 50 to 60 years	136
From 60 to 70 years	131
From 70 to 80 years	32
From 90 to 100 years	0
From 100 to 102 years	1
Total	1389

From the above table it will be seen that the great majority of my patients were robust and middle-aged persons; the number of children, and of aged people, being comparatively small: those between twenty and thirty amounted to more than a third of the whole; and those from twenty to forty to more than half. About one-third of the total of the male patients were soldiers; the remaining two-thirds consisted of shoemakers, tailors, masons, carpenters, locksmiths, labourers, and porters. The aged were almost all paupers, who, from want, improvidence, or infirmity, had been lodged either in the town or in the country, whence they are taken to Hospitals on being attacked with serious illness; accordingly, many of them are beyond hope, even at the time of their admission, a circumstance which greatly increases the mortality of this period of life, as we may judge from the following table, which shews the proportion of mortality according to age and sex.

Table of mortality in the Medical Wards for the years 1834, 35, *and* 36.*

Age.	Men.		Women.		Total.		Proportion of deaths in 100 patients.
From 0 to 10 years	2	0	18	1	20	1	5,0
From 10 to 20 years	64	5	36	6	100	11	11,0
From 20 to 30 years	410	25	93	10	503	35	6,0
From 30 to 40 years	224	31	56	8	280	39	14,0
From 40 to 50 years	168	34	62	13	230	47	20,0
From 50 to 60 years	86	17	50	17	136	34	25,0
From 60 to 70 years	62	19	59	13	121	32	26,4
From 70 to 80 years	47	17	22	5	69	22	31,9
From 80 to 90 years	16	8	16	3	32	11	34,4
From 90 to 100 years ...	0	0	0	0	0	0	0
From 100 to 102 years ...	0	0	1	1	1	1	100,0
Total	1079	156	413	77	1492	233	15,6

We see, from this table, that if we except the period between ten and twenty years, in which the ratio of mortality is greater than in the following period, the proportional number of deaths increases with age. Thus, while the sick between twenty and thirty die only in the proportion of six in one hundred, those between thirty and forty die in the proportion of fourteen in one hundred. Finally, in advanced age, we see that *one* dies out of *three*. The total proportion is fifteen and six-tenths to the hundred patients; but if we subtract from the deaths, twenty-six, who died within thirty-six or forty-eight hours from their admission into the Hospital, we shall have for the mortality of the sick treated in the medical wards, 13.8 in one hundred, or *one* death out of *seven* patients. The proportion of deaths is smaller amongst the males than the

* It will be observed that the results of this table do not correspond with those of the preceding. We regret that we have not the means of rectifying the error.—Eds.

females, in the ratio of 14.5 to 18.6, a difference which is to be attributed to the greater number of males patients, from which it results that the average is established on large numbers. Another cause of the lesser mortality among the males is that the majority were between the ages of twenty and thirty, a period at which, as we have seen, the deaths are few.

The whole of the diseases treated in the medical wards during the years 1834, 35, and 36, form the subjoined table, which shews the termination by deaths or recovery in the patients of both sexes. We must not, however, take for granted, that all who did not die, were cured, as patients labouring under chronic diseases often request permission to leave the Hospital, not only while the disease remains stationary, but sometimes even after it has become aggravated.

Table, shewing the diseases treated in the Medical Wards of the Geneva Hospital, during the years 1834, 1835, *and* 1836.

Names of diseases.	Men.		Women.		Total.	
	SICK.	DIED.	SICK.	DIED.	SICK.	DIED.
Acute pulmonary catarrh	38	0	17	0	55	0
Chronic pulmonary catarrh	37	4	19	7	56	11
Suffocative pulmonary catarrh	1	1	0	0	1	1
Pneumonia	49	16	6	2	55	18
Acute and chronic pleurisy	33	5	4	1	37	6
Aneurism of the aorta	2	0	0	0	2	0
Pulmonary phthisis	97	36	23	11	120	47
Hæmoptysis	4	0	0	0	4	0
Cancer of the lungs	0	0	1	1	1	1
Diseases of the heart	48	25	23	17	71	42
Hydrothorax	2	2	3	3	5	5
Palpitations	2	0	0	0	2	0
Hooping cough	0	0	2	0	2	0
Asthma	2	0	2	0	4	0
Œdema of the glottis	1	1	0	0	1	1
Apthæ	1	0	0	0	1	0
Angina, tonsillar, and pharyngeal.	14	0	3	0	17	0
Ptyalism, idiopathic	1	0	0	0	1	0

Names of diseases.	Men.		Women.		Total.	
	SICK.	DIED.	SICK.	DIED.	SICK.	DIED.
Gangrene of the mouth (mercurial) ...	1	1	0	0	1	1
Catarrhal fever	21	0	35	4	56	4
Bilious fever	35	0	15	0	50	0
Gastric derangement	72	0	25	0	97	0
Hypochondriasis	10	0	3	0	13	0
Organic disease of the liver	3	3	3	3	6	6
Icterus	8	0	0	0	8	0
Cancer of the stomach and œsophagus	9	8	1	1	10	9
Gastralgia	10	0	10	0	20	0
Acute gastritis	2	0	1	1	3	1
Hæmatemesis	0	0	1	0	1	0
Acute peritonitis	1	0	1	0	2	0
Chronic peritonitis	3	1	1	1	4	2
Acute enteritis	22	1	10	0	32	1
Chronic enteritis	15	2	9	2	24	4
Enteralgia	3	0	3	0	6	0
Dysentery	4	0	2	0	6	0
Colic from lead	8	0	0	0	8	0
Hæmorrhoids	5	0	2	0	7	0
Acute diarrhœa (*cholerine*)	16	0	0	0	16	0
Indigestion	2	0	0	0	2	0
Constipation, intestinal derangement	1	0	2	0	3	0
Cholera morbus, sporadic	0	0	2	0	2	0
Ascites	7	1	3	2	10	3
Tænia	5	0	1	0	6	0
Cancer of the rectum	1	0	0	0	1	0
Tabes mesenterica	1	0	0	0	1	0
Acute and chronic laryngitis	7	0	2	0	9*	0
Nostalgia	1	0	0	0	1	0
Insanity	13	0	13	0	26	0
Epilepsy	8	0	1	0	9	0
Apoplexy with effusion	7	5	7	3	14	8
Cerebral congestion	4	2	0	0	4	2
Drunkenness	14	1	0	0	14	1
Delirium tremens	3	1	1	0	4	1
Idiotcy (from cerebral affection) ...	5	1	2	0	7	1
Loss of memory (from apoplexy) ...	1	0	1	0	2	0
Hemiplegia (following apoplexy) ...	4	2	7	3	11	5
Encephalitis	6	2	0	0	6	2
Cephalalgia	9	0	5	0	14	0
Vertigo	5	0	1	0	6	0
Acute hydrocephalus	1	1	1	1	2	2
Acute and chronic meningitis	2	2	2	2	4	4
Syncope	0	0	1	0	1	0
Caries of the vertebra	3	1	0	0	3	1
Paraplegia	7	1	1	0	8	1
Spinal irritation	2	0	8	1	10	1
Acute and chronic myelitis	6	3	4	0	10	3
Paralysis of the arm	2	0	0	0	2	0
Paralysis of the four extremities	3	0	0	0	3	0
Nervous and mercurial tremors ...	3	0	0	0	3	0
Retention of urine	3	1	0	0	3	1
Incontinence of urine	1	0	0	0	1	0

* One case syphilitic.

Names of diseases.	Men.		Women.		Total.	
	SICK.	DIED.	SICK.	DIED.	SICK.	DIED.
Hæmaturia and nephritis	4	0	0	0	4	0
Cystitis and catarrh of the bladder	3	1	2	0	5	1
Acute articular rheumatism	37	0	13	0	50	0
Chronic articular rheumatism	9	1	6	0	15	1
Muscular rheumatism, lumbago, &c.	34	0	8	0	42	0
Sciatica	21	0	3	0	24	0
Intermittent fever	60	0	3	0	63	0
Typhoid fever	36	6	17	5	53	11
Puerperal fever (metro-peritonitis)	0	0	3	0	3	0
Metrorrhagia	0	0	2	0	2	0
Amenorrhea and dysmenorrhea	0	0	6	0	6	0
Dropsy of the ovary	0	0	2	0	2	0
Anemia	0	0	1	0	1	0
Natural variola	4	1	0	0	4	1
Secondary variola (after vaccination)	6	0	2	0	8	0
Erysipelas	17	0	4	0	21	0
Nettle rash	2	0	1	0	3	0
Scarlatina	6	0	4	0	10	0
Purpura hæmorrhagica	0	0	1	1	1	1
Roseola	2	0	0	0	2	0
Zona	1	0	0	0	1	0
Prurigo	3	0	3	0	3	0
Herpes	2	0	0	0	2	0
Ecthyma	1	0	0	0	1	0
Eczema	1	0	0	0	1	0
Chloasma (liver spots)	1	0	0	0	1	0
Itch	0	0	1	0	1	0
Elephantiasis	0	0	1	1	1	1
Boils	4	0	0	0	4	0
Cynanche parotidea	2	1	0	0	2	1
Gangrene of the skin	2	1	0	0	2	1
Anasarca (one case after scarlatina)	10	2	5	1	15	3
Senile marasmus	6	4	5	2	11	6
Ophthalmia (one case iritis)	1	0	1	0	2	0
Otitis and deafness	2	0	1	0	3	0
Neuralgia facialis	2	0	0	0	2	0
Ozæna	0	0	1	0	1	0
Odontalgia	0	0	3	0	3	0
Scurvy	1	0	0	0	1	0
Syphilis, constitutional	1	0	2	0	3	0
Periostitis	3	2	1	0	4	2
Orchitis	2	0	0	0	2	0
White swelling	1	0	0	0	1	0
Abscess, various	3	0	0	0	3	0
Muscular cramps	0	0	1	0	1	0
Hiccough	1	0	0	0	1	0
Bronchocele	1	0	0	0	1	0
Obstruction of the spleen	1	0	0	0	1	0
Asphyxia from submersion	1	0	1	0	2	0
Plethora, sanguineous	1	0	0	0	1	0
Fatigue, old age, want	13	0	2	2	15	2
Total	1015	149	396	78	1411	227

This table shews the diseases that most frequently attack that class of the population of Geneva, which applies for hospital relief. The acute diseases that most commonly present themselves in the wards of the hospital are acute pulmonary catarrh; pleurisy; pneumonia; derangement of stomach; catarrhal, bilious, intermittent and typhoid fevers; tonsillar and pharyngeal angina; acute enteritis; cholerine; articular and muscular rheumatism; sciatica; erysipelas; apoplexy, and cerebral congestion. The chronic diseases that occur are chronic pulmonary catarrh; chronic pleurisy; pulmonary phthisis; organic diseases of the heart and the dropsy consequent upon it; hypochondriasis and the organic diseases of the liver and the stomach; gastralgia and chronic enteritis; chronic articular rheumatism; paralysis from cerebral affection, and lastly the marasmus into which the aged fall, without presenting any organic lesion sufficient to account for their death.

As we have already stated, the mortality of chronic diseases cannot be appreciated by comparing the number of patients with that of the deaths; but, as regards acute diseases, the case is different, as patients are not removed from the hospital while labouring under them; and, consequently, the relative proportion of the diseases and the deaths will give the approximative result of medical treatment.

We find that out of fifty-five cases of pneumonia, eighteen, or *one-third,* were terminated by death. This proportion will appear great, if considered alone; but if what we have already stated relative

to the large number of the aged who subsist on public charity, and who are not brought into the hospital until their state is desperate, it will be readily perceived that the mortality of *one third* cannot be considered as indicating inefficiency of medical treatment; and if we subtract from the whole number the patients who died within forty-eight hours of their admission, the result would be very different. The treatment which I follow in almost all these cases consists of bleedings, general and local, the exhibition of the white oxide of antimony in the dose of from two to four drachms in the day, and of mercurial frictions in the cases which do not yield to this method. The table of mortality which I have kept of cases of pneumonia, demonstrates the correctness of the opinion expressed by M. Louis, that the number of deaths from this disease is in the direct ratio of the age of the patients.

The cases of acute pleurisy never terminated fatally, except where they were complicated with organic disease of the lungs, or heart, or where the pleurisy coexisted with tubercles contained in the pleuritic false membranes. Such was the case in six patients out of thirty-seven who were attacked with acute or chronic pleurisy. I did not meet with double pleurisy, except in cases where there were tubercles in some organ, most frequently in the lungs.

There were fifty-three cases of typhoid fever, out of which eleven, or *one fifth*, died, a result which I consider favourable, on account of the gravity of the cases which I had to treat. From this number

also, I ought to subtract one in which death took place from indigestion, the patient having been in full convalescence, when fruit was given him: in the efforts of vomiting produced by its ingestion, a perforation of the intestine was produced, which was soon followed by death. Typhoid fevers require continual watching, and if we have not the advantage of having a well-aired ward, with two beds for each patient, so that he may be changed three or four times a day, and a hospital-man who shall have no other duty than to provide for the cleanliness and continual ablutions required by this class of patients, we shall have to deplore the loss of many an unfortunate patient who might have been saved had he enjoyed the hygienic advantages we have just enumerated. All these precautions were taken in our hospital, so that I can confidently affirm that each of our patients was the object of as minute and unceasing attentions, as if he had belonged to the highest class in society. The medical treatment consisted in tepid baths, in which the patient was kept for a long time (two or three hours), the water being poured on the shaved head, or on the body; in the administration of saline purgations every other day, and finally, according to the nature of the case, in external stimulants by blisters, or internal, by the most active tonics. This last medication seemed most suitable to the fevers of the last winter and spring, whilst in the preceding periods, the typhoid fevers had a more inflammatory character, and required a tolerably active and antiphlogistic treatment.

Cases of acute enteritis are of rare occurrence at

Geneva ; I have therefore had few opportunities of prescribing for this class of diseases. Amongst the number of persons attacked by it, it has proved fatal to one individual only, in whom I found ulcerations in all the larger intestines, but none in the smaller ones. Cases of chronic enteritis, characterized by diarrhœa and wasting were frequently met with in old men : in such cases every medical application failed, and the disorder almost invariably assumed the decided character of anasarca.

Cerebral affections have shewn themselves under various forms. Amongst children and young persons, the most frequent form was tubercular meningitis and acute hydrocephalus ; and so great has been its malignity, that not one patient in our hospitals has recovered from this disease. Amongst adults we have seen intoxication followed by death ; and on close inspection we have discovered no other cause of disorder than a strong smell of alcohol pervading all the organs, and more especially the brain. We have also had four cases of delirium tremens in adults, of which one has proved fatal. Encephalitis, chronic cephalalgia, and vertigo, were the forms in which cerebral affection shewed itself in adults. Amongst old persons, cerebral congestion and apoplexy, with extravasation of blood in the cerebral pulp, were frequently to be met with. I have been able to trace very frequently the influence of organic disease of the heart in the development of apoplexy, or cerebral congestions which resemble apoplexy. Two of the latter cases terminated in death ; and on examination the vessels of the brain were found overcharged with blood, but

without rupture or effusion. In the cases of cerebral congestion, connected with disease in the heart, the patient always derived benefit from cupping in the region of the præcordia; and I have succeeded by this local means in relieving the circulation, which had been obstructed by the too great quantity of blood accumulated in the cardiac cavities. Blisters applied here and at the back of the neck were found very serviceable in subduing symptoms which resisted aperients and venesection.

A considerable number of cases of disease in the spinal marrow has fallen under my observation. My attention has been much directed to spinal irritation, and by following with perseverance the mode of treatment laid down by the English practitioners, I have succeeded in subduing symptoms of several years' duration, and which presented a very alarming appearance. One of these cases terminated fatally, and, on dissection, presented us with no other symptom of disease than a very slight vascularity of the membranes. Acute myelitis was observed upon two or three different occasions in one of these cases, which terminated in death, after having presented tetanic symptoms, we discovered violent inflammation of the cerebral and spinal membranes. Some of the cases of paralysis of the limbs which appeared to be connected with loss of power of the nervous system, were treated with nux vomica, in doses increasing from one to sixteen grains, in the four-and-twenty hours; and I may here remark, that from the comparative use of strychnine, the alcoholic extract of nux vomica, has appeared to me more advantageous, whether we

argue from the certainty of its effects, or from the absence of distressing symptoms, and of derangement of the digestive organs. In one of these cases, the nux vomica removed a dysentery, which for several months had resisted all the means employed to subdue it. Other cases of paralysis have been treated with the greatest success by galvanism applied to the vertebral column, and to the paralysed limbs; one of the patients, who for seven months had been treated without success in all the customary methods, and in whom the four extremities were successively attacked, in a progressive advance of paralysis, was completely cured by galvanism. Another patient, also attacked by paralysis in the four extremities, was considerably benefitted by galvanism, and radically cured by the nux vomica which had been unsuccessfully employed before the application of the galvanic battery.

We shall conclude this review of the principal cases treated in our hospital, by noticing the infrequency of eruptive disorders, and in particular of variola. This malady almost entirely disappeared in Geneva in 1834 and 1835, during which years only three cases occurred in our hospitals; but in 1836 a German workman brought the contagion from the German frontier of Switzerland, and spread it in the town, so that in that year the patients attacked with variola, amounted to nine, and the number will probably be more considerable in 1837. Out of the twelve cases of variola, four of the patients had not been vaccinated; and amongst them one death occurred; the remainder had all been vaccinated, and had the disorder very slightly, and in its most simple form.

I shall conclude these details by some remarks relative to the influence of the seasons on the development of disease. This subject may be investigated in two ways; either by comparing different years one with another, and observing whether there exists any connexion between the state of the atmosphere and the annual number of certain disorders, or by collating the monthly or quarterly entries of certain affections which are supposed to be influenced by the course of the seasons. I have attended to both these modes of research, and it is by the results at which I have arrived, that I am led to assert the influence of temperature in the development of certain maladies. The years 1834, 1835, and 1836, presented some meteorological phenomena, which it is necessary to mention, in order to establish an exact comparison of the relative frequency of some classes of diseases. In 1834 the temperature was for the most part high; there was a long season of drought, with a much greater prevalence of north wind than we find in the following years. The mean annual temperature which in 1833 had been 5°19, was 8°93 in 1834. This is a greater average than that of the thirty-nine preceding years, and it makes the nearest approach, without being equalled by it, to that of 1811, in which the mean temperature was 8°89. The results of the hygrometer confirm what we have already observed respecting the year 1834, which was at once warm and dry; the average of the hygrometer was lower than it had been for thirty-six years preceding. The quantity of rain which fell in the year was twenty-two inches ten

lines, the average of ten years being twenty-eight inches four lines. With regard to the north winds observed in the course of the year, their relation to those of the south was as sixty-six to thirty-four, whilst in the five preceding years this relation had been, north winds fifty-six to south winds forty-four.

In 1835 the temperature was lower than in 1834; the variations of the atmosphere were more frequent, and there was a greater quantity of humidity in the air, and of rain penetrating into the soil. The mean temperature for the whole year was 7°49 ; that of 1834 had been 8°93. The quantity of rain was twenty-six inches ten lines, whilst in 1834 it had been calculated at twenty-two inches ten lines ; and the predominance of north winds, which are accompanied by dry weather, over the south, which bring rain, was much less marked than in the year 1834, the proportion being forty-eight to thirty-four, instead of sixty-six to thirty-four.

I do not possess any document relative to the mean temperature of 1836, but, on consulting my notes and my recollections, I may venture to adduce the following particulars, as characterising the temperature of 1836. The north wind predominated in a very remarkable manner, the number of rainy days differed little from other years, but there was something remarkable in the regularity of their duration ; instead of those sudden variations so frequent in our climate, the weather in 1836 was sometimes clear and dry, sometimes wet and cloudy ; but in either case the same temperature lasted for several days ; indeed, often for weeks and even months together. The autumn of 1836 was cold

and rainy, and the winter set in very early, although later than in 1835, when it might be dated from the end of September.

We may sum up these remarks by observing that the year 1834 was hot and dry; 1835 wet and changeable; 1836 was neither very hot nor very dry, but the same temperature prevailed for a considerable space of time. Let us now see what was the influence of these different circumstances on the development of the disorders admitted into the hospital.

Comparison of the frequency of certain diseases in 1834, 1835, *and* 1836.

		1834.		1835.		1836.	
Acute pulmonary affections	Acute catarrh	12	27	28	53	15	30
	Pneumonia	15		25		15	
Acute abdominal affections	Diarrhœa, cholerine, acute enteritis	21	52	7	46	20	37
	Gastric derangement	31		39		17	
Acute affections of the brain	Apoplexy, hemiplegia	9	18	2	8	11	21
	Cerebral congestion, encephalitis, meningitis, hydrocephalus, delirium tremens	9		6		10	
Continued fevers	Bilious	29	72	16	63	5	24
	Typhoid	13		27		13	
	Catarrhal	30		20		6	
Intermittent fevers			18		30		15
Acute articular rheumatism			16		21		13
Variola and varioloid diseases			2		1		9

If, in the first place, we investigate the influence of the state of the atmosphere on the total number of admissions, we shall find for the years—

	Admissions.
1834	476
1835	515
1836	467

By which we see that the humidity and variations of the year 1835 brought a greater number of

patients into our wards than the heat and drought of 1834, and the settled temperature remarked in 1836. The latter year has been especially remarkable for the small number of invalids in the town as well as in the hospital; it is therefore probable that humidity and variations of temperature are circumstances more favourable to the development of disease, than heat and drought, and especially a settled temperature.

If we now study the influence of the temperature with the assistance of the above table, we shall observe that acute disorders of the chest (pulmonary catarrh and pneumonia) are much more frequent in damp and variable years; indeed, the number of complaints of this kind observed in 1835, is equal to that of the cases admitted in the two years, 1834 and 1836.

With regard to acute diseases of the abdomen, we find, on the contrary, their number to be the greatest in the hottest and driest year, and the least in the coldest year; but the difference is far from being as striking as in the diseases of the chest.

The complaints which affected the encephalic organs, were also more rare during the cold and damp year, and much more frequent during the other two years. It even appears that the heat and drought of 1834 had not so bad an influence in this respect as the regular temperature of 1836. I do not remember having observed at any other period so great a number of attacks of apoplexy, of meningitis, and of other cerebral affections.

Bilious fevers are usually produced by heat, and thus we see their maximum coincide with the hottest

year. Typhoid fevers were much more frequent during the year 1835 than at either of the other periods; from whence we may infer that the humidity and variableness of the atmosphere are more favourable to their development than heat and drought. It is possible, however, that the conclusions to be drawn from a malady which is propagated by contagion, are not so certain as those which may be deduced from an affection purely sporadic. Catarrhal fevers were more frequent in 1834 than in the other two years; but it must be remembered that the winter of 1833-1834 was long and rainy, and to this circumstance was probably owing the great number of catarrhal fevers at this period.

Intermittent fevers were double in number in 1835 to the other two years; but if this is partly attributable to the humidity of the season, it is also certain that the cleansing of the sewers in the vicinity of the barracks, brought into our wards a great number of soldiers attacked with intermittent fever of the most obstinate kind, which broke out three or four times in the course of the summer.

Acute articular rheumatism was frequent during the year 1835, which, as we have already said, was cold and damp. It was of rare occurrence in 1836, when the atmosphere was in its most settled state, and was of an intermediate frequency in the hot and dry year of 1834; so that, on investigation, the variations of the temperature appear to exercise a certain influence on the development of acute articular rheumatism.

In summing up the different facts which may be

deduced from the preceding table, we arrive at the conclusion, that the greatest number of invalids is to be met with in damp and variable years, and that this augmentation is principally occasioned by acute disorders of the chest, typhoid fevers, and acute articular rheumatism. During hot and dry years, acute disease of the abdomen and bilious fevers are more frequent than under different circumstances; and lastly, when the temperature is the least varied, and at the same time at a certain degree of elevation, cephalic affections are met with more frequently than at any other period.

We have before remarked, that we may judge of the influence of the seasons on the development of certain diseases, by comparing the monthly or quarterly entries of particular affections, which we may suppose to be modified by the course of the seasons. The following table will acquaint us with the result of these researches :—

Table of the frequency of certain diseases in the several months of the year.

Name of diseases.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Acute pulmonary catarrh	7	10	8	12	6	0	1	1	2	1	5	4	57
Chronic pulmonary catarrh	6	5	9	7	4	1	3	6	2	2	4	6	55
Pneumonia	9	4	4	3	6	3	3	3	3	0	5	8	51
Apoplexy	2	4	1	0	2	1	4	1	1	2	3	2	23
Erysipelas	3	0	0	3	0	2	3	3	4	1	0	1	20
Acute articular rheumatism	4	3	4	1	5	3	2	7	4	2	6	3	44
Acute muscular rheumatism, lumbago, pleurod., stiff-neck	4	3	1	2	3	0	1	1	0	0	4	3	22
Sciatica	1	3	1	3	1	1	7	2	0	0	1	2	22
Bilious fever	2	2	5	6	3	10	7	1	6	4	1	2	49
Intermittent fever	1	0	2	9	12	10	9	7	5	3	2	2	62
Catarrhal fever	6	10	8	3	6	4	3	1	1	0	3	7	52
Typhoid fever	4	3	1	2	2	3	9	10	7	4	6	2	53

This table is the average of the monthly entries of each malady during the three years, 1834, 1835, 1836.

If we successively study each of the maladies indicated above, we shall arrive at the following results upon the questions which occupy us :—

I. PULMONARY CATARRH, ACUTE AND CHRONIC.

Patients attacked with acute pulmonary catarrh, presented well marked symptoms, viz., a frequent cough, with frothy expectoration, which was white or yellowish, without any mixture of blood, at the same time that they all suffered from fever and pains in the chest; but these symptoms quickly disappeared, particularly the fever, which was no longer discernible after the first three or four days. The subjects of this disorder were usually robust young persons, who had habitually enjoyed good health. It proved fatal to none, and the greater number of them made but a short stay in the hospital.

The influence of the seasons on the development of acute pulmonary catarrh, may be deduced from the following summary. Out of fifty-seven admissions, thirty-seven were found to occur in the coldest and most variable months of the year, January, February, March, and April; eight in the hottest months, May, June, July, and August; and twelve in the months of September, October, November, and December. Three-fourths of this last mentioned number are entered in the months of November and December, only three cases having

occurred in September and October. If we compare the four seasons one with another, they stand thus :*

Winter	21
Spring	26
Summer	2
Autumn	8

We may therefore consider the cold of winter, and especially the variable temperature of the spring, as the principal cause of the development of acute bronchitis, whilst the heat of summer and the humidity of autumn check its progress.

Chronic pulmonary catarrhs were characterized by a frequent habitual cough, accompanied by abundant yellowish expectoration, with slight feverishness. The greater number of patients who were treated in the hospital for chronic pulmonary catarrh, were old persons afflicted with some organic disorder; of which the catarrh was indeed only a symptom, but, at the same time, the most apparent symptom, and that which obliged the patient to have recourse to medical treatment. Many of these were carried off by a complication of disease of the heart, of hydrothorax, and senile marasmus.

The entries of chronic pulmonary catarrh are distributed in the following manner in the different seasons :—

Winter	17
Spring	20
Summer	10
Autumn	8

* In all cases in which we refer to the seasons, we understand by *winter* the months of January, February, and December; by *spring*, March, April, and May; by *summer*, June, July, and August; and by *autumn*, September, October, and November.

It hence results, that without exhibiting as marked a difference as in the acute bronchitis, the influence of the seasons in the aggravation of chronic bronchitis is sufficiently evident, since we find thirty-seven entries in the cold or variable months, whilst there are but eighteen in the hot or temperate months.

The seasons take the following order with regard to the aggravation of chronic pulmonary catarrh: 1st, Spring; 2nd, Winter; 3rd, Summer; 4th, Autumn. At these two latter periods, persons attacked with chronic bronchitis seldom apply for admission into the hospital.

II. PNEUMONIA.

Patients treated for pneumonia had all fever, pain in the side, cough, and a rusty, viscid, semi-transparent expectoration. In every case the disease had commenced a few days only before the entrance of the patients into the hospital. The following is the summary of the entries for the different seasons :—

Winter	21
Spring	13
Summer	9
Autumn	8

So that we may consider the winter and spring as the periods when fluxions of the chest are most frequent, whilst in summer and autumn this disease is diminished by half the number of cases. The variable climate of spring, and especially the cold of winter, exert a dangerous influence over persons

disposed to contract this kind of malady; they should therefore carefully avoid exposure to cold, abstain from drinking any thing cold when heated, and should especially guard against insufficient clothing, one of the most usual causes of inflammation in the chest amongst elderly persons, who formed, as we have before observed, a considerable proportion of our patients.

III. APOPLEXY.

The patients seized with apoplexy exhibited a temporary loss of consciousness, symptoms of paralysis, and all the indications of effusion of blood on the brain; a lesion which was verified by the examination of those to whom the disease proved fatal. The number of cases of apoplexy admitted into the hospital was much too small to enable us to arrive at any definite conclusion; nevertheless, as their distribution is far from being equal in the different seasons, I have thought it right to point it out. The admissions are distributed in the following manner:—

Winter	8
Spring	3
Summer	6
Autumn	6

Whence it results, that spring is the season in which the smallest number of cases of apoplexy occurs; and winter that in which they are most frequent. Summer and autumn furnish more cases than the spring, and fewer than the winter.

IV. ERYSIPELAS.

In the cases of erysipelas observed in the medical wards, the disease was almost invariably confined to the face or to the scalp. There was scarcely an instance in which it occurred in the body or the limbs. The total number of patients in this disorder was twenty; but however small the amount, the distribution among the different seasons is so unequal, that it seems pretty clearly to indicate an influence in the development of erysipelas. For fifteen of these cases were observed in the months comprised between April and September, and only five from October to March. The comparison of the four seasons presents the same result: —

Winter	4
Spring	3
Summer	8
Autumn	5

Summer and autumn are then the seasons in which we meet with the greatest number of cases of erysipelas, whilst this malady is less frequent in winter, and especially in the spring; and such is the influence of a hot and dry temperature, that a few weeks of this description are sometimes sufficient to convert erysipelas into an epidemic disorder. We remarked this fact in the month of June, 1837, when the dry heat which prevailed throughout the month, developed a very considerable number of cases of erysipelas in the face, the scalp, and the limbs. I remember no period during my medical practice in which this species of malady has been so frequent as in the month to which I have just alluded.

V. ACUTE ARTICULAR RHEUMATISM.

Patients afflicted with acute articular rheumatism were for the most part feverish, and had swellings of one or of several of the joints, which were hot and painful on pressure and motion. In all the cases, the disease had declared itself but a few days before the admission of the patients into the hospital. Their distribution in the different seasons gives us for

Winter	10
Spring	10
Summer	12
Autumn	12

It hence appears that the cold and variable season of the winter and spring months affords the fewest cases of acute articular rheumatism, whilst the elevated and moderate temperatures of summer and autumn, seem rather to favour the development of this disease. But we must not omit to add, that the numbers on which these results are founded, are not sufficiently marked to permit us to consider them as definitive. Still there is one conclusion to be drawn from the preceding table, which is, that acute articular rheumatism, instead of belonging exclusively to one particular season, as my recollections would have led me to believe, shews itself with nearly an equal degree of frequency at the different periods of the year, and hence we may conjecture the individual condition of each patient to be a more important point in the production of rheumatism than damp, cold weather, or the variations of the atmosphere.

We must not, however, lose sight of the influence of the weather on the development of rheumatism, since the patients of this class have sometimes been double in number in a cold and damp year to those of a hot and dry one. Finally, the opinion that a chill on the cutaneous surface during an abundant perspiration, is an essential circumstance in the development of acute rheumatism, is thus rendered more probable ; whilst the predisposition induced by means of a cold and damp temperature would appear to act but a secondary part in the production of the phenomenon which we are considering.

VI. ACUTE MUSCULAR RHEUMATISM.

Under this denomination I have classed patients attacked with lumbago, pleurodyne, and stiff neck, when these different affections have presented themselves in an acute form. Their number is much more limited than that of the cases of articular rheumatism, amounting to twenty-two only, instead of forty-four ; nevertheless, their mode of distribution in the different seasons, furnishes us with more distinct results than those of which we have just spoken. The following is the number of entries :—

Winter	10
Spring	6
Summer	2
Autumn	4

From which we perceive the great frequency of this disease in the winter, its rare occurrence during the summer months, and the intermediate state of prevalence in spring and autumn. In acute muscular rheumatism, then, the order of the different seasons

in point of frequency is as follows—winter, spring, autumn, and summer; so that we may consider cold, damp, and the variations of temperature, as the principal causes of this disease, whilst heat and dry weather much diminish its frequency. This conclusion is quite contrary to that which we have just established respecting articular rheumatism. But we must not be greatly surprised at this result, for differences so remarkable separate these two classes of diseases, that it can scarcely be considered sound logic to unite under the same generic name, two affections as different in their form, their seat, and their duration, as in the circumstances of their development.

VII. SCIATICA.

Acute sciatica is a disorder which approaches to neuralagia in its seat, and rheumatism in the circumstances of its development, and by the transformation which it sometimes undergoes into muscular or articular rheumatism. As I have before had occasion to observe, the division of the entries amongst the different seasons gives us the following result :—

Winter	6
Spring	5
Summer	10
Autumn	1

Whence it results that summer is the period when sciatica is most frequent, and autumn the season in which it is most rarely met with. In winter and in spring, the cases are more numerous than in autumn, but the disease is less frequent by half than it is in

summer. These results will appear surprising to those who may have observed that persons habitually suffering from this kind of malady, dread cold and a variation of temperature more than heat and drought. It is, however, evident that a greater number of facts is absolutely necessary before we can admit these conclusions as definitive.

VIII. BILIOUS FEVERS.

The diseases comprehended under the denomination of bilious fever, were characterised by pains in the head, anorexia, feverish symptoms, generally more intense in the evening, a yellowish appearance of the tongue, and by constipation or feculent diarrhœa. This combination of symptoms did not continue above one or two weeks. There was was neither stupor nor typhoid, nor any of the symptoms which the ancients designated malignant bilious fever, and which are now recognised as cases of *dothinentherite.*

There are few complaints more influenced by the course of the seasons than bilious fevers; indeed, out of forty-nine cases of this kind observed in the hospital, thirty-two were admitted during the six months which begin with the month of March and finish with that of August, whilst from September to February there were but seventeen admissions. Their distribution in the four seasons gives the following result:—

Winter	6
Spring	14
Summer	18
Autumn	11

Whence it results, that winter is the season the least favourable to the development of bilious fever, that summer is the time of year in which this disease attains its maximum of frequency, and that spring makes the nearest approach to summer, and autumn to winter: we are, therefore, led by the above statement to consider as well-founded the opinion relative to the influence of heat in inducing a great number of bilious disorders, and cold in preventing their development. The correctness of this conclusion is still further confirmed by observing that the two hottest months of the year, June and July alone, furnish more than a third (seventeen out of forty-nine) of the total number of bilious fevers.

IX. INTERMITTENT FEVERS.

Three-fourths of the cases of intermittent fever admitted into the hospital were of the tertian type, two only were quartan type, the remainder were quotidian: no dangerous fever occurred during the three years which I am now reviewing. The frequency of intermittent fevers in the different seasons results in every country from the combined operation of the temperature and the exterior configuration of the soil. I know of no work relative to the frequency of intermittent fevers in Geneva. The following is the number of entries for the four seasons:—

Winter	3
Spring	23
Summer	26
Autumn	10

By this table we perceive that spring and summer are the two seasons in which intermittent fevers are the most frequent; autumn, and especially winter, exhibit but a very small number. The conjoined amount of the admissions for spring and summer is forty-nine out of sixty-two, or four-fifths of the total number, whilst autumn and winter together have but thirteen admissions, or one-fifth. If we examine the entries month by month, we shall find that the maximum corresponds with the month of May, the minimum with that of February; and that, dating from the month of April, fevers are very frequent till the month of August, from which time they successively diminish through November, December, and January, a period of the year in which their number is very limited. The six months from April to September is, then, the most favourable season for the development of intermittent fevers, fifty-two cases out of sixty-two having occurred during this interval; and in this six months it is the first half which presents the greatest number of cases, in the proportion of thirty-one for April, May, and June, and twenty-one for July, August, and September; so that it may be definitively concluded that the atmospheric phenomena usually exhibited towards the end of spring, and at the beginning of summer, give rise in this country to intermittent fevers. We may remark that this disease cannot be considered as very frequent at Geneva, since but sixty-two cases have occurred out of one thousand four hundred and five, which is one case to twenty-two or twenty-three; whilst at Turin, in one hospital alone, which does not

receive more intermittent fevers than other establishments of the same kind, the proportion has been a hundred and eleven out of seven hundred and eighty-six, or one case in seven.

X. CATARRHAL FEVERS.

The Genevese practitioners often meet with continued fevers, which are characterised by a cough more or less frequent, an abundant expectoration, white or yellowish, but without any mixture of blood, sometimes with pleuritic pain, and always accompanied by cephalalgia, marked anorexia, and daily exacerbations.

These fevers, the duration of which is from three to four weeks, are designated by the ancients under the name of catarrhal, and it is difficult to give them any other denomination, for they differ as much from simple bronchitis, as a simple attack of fever differs from continued fever. The following is the distribution of catarrhal fevers, in the different seasons :—

Winter	23
Spring	17
Summer	8
Autumn	4

Whence it results that this class of diseases rarely occurs but in the six months commencing with December and terminating with May, whilst from June to November the cases of catarrhal fever become gradually more infrequent as autumn approaches. The three coldest months, December, January, and February, are the periods of the year in which

we meet with the greatest number of cases. Spring follows winter in the order of frequency of catarrhal fevers, then summer, and lastly autumn; whence we are authorised in concluding, that cold and a variable temperature act an important part in the development of the disorder which we are considering.

XI. TYPHOID FEVERS.

The fevers I have thus designated have all presented to me the characters assigned by M. Louis to this class of disorders. All my patients had symptoms of stupor, the tongue more or less dry, cephalalgia, deafness, singing in the ears, diarrhœa before or during the fever, tyhhoid spots on the body, and a feverish state, which lasted from three to six weeks. All those who died of this disease had the eruption of the patches and ulcerations of the dothinenterite, at the end of the ileum and in the beginning of the larger intestine. It is evidently the very same malady that I have been called upon to treat, and I may, without fear of error, unite all the cases under the same denomination, in investigating the influence of the seasons on its development. The following is the quarterly summary for typhoid fever :—

Winter	9
Spring	5
Summer	22
Autumn	17

There are, then, in the heat of summer, and in the damp of autumn, unfavourable circumstances

for persons predisposed to contract this complaint, whilst the cold of winter, and the variability of spring, tend to prevent its development. This influence is so decided, that out of fifty-three admissions, only fourteen occurred in the winter and spring half year; instead of which, there are thirty-nine in the autumnal and summer quarters. In diseases, however, which are propagated by contagion, we should be very cautious in the conclusions which we draw with regard to their frequency in different seasons. We must also remember that the greater number of eruptive and contagious disorders are communicated more quickly in summer and autumn than at any other season, and this circumstance, common to these two classes of diseases, gives additional probability to the opinion which cousiders typhoid fever to be contagious.

CONCLUSION.

If we now collate the different facts contained in this paper, and endeavour to ascertain the frequency or the rarity of the diseases we have been considering, with reference to the climate of Geneva, and to the influence of the different seasons, we may trace the following summary of the influence of the seasons on the development of certain diseases.

1*st. Winter* (*December, January, and February*). —During this quarter, which may be considered as the coldest in the year, the number of patients admitted into the hospital is in general pretty considerable, without, however, being the fullest season

of the year. The prevailing maladies during these three months are pneumonia, catarrhal fevers, acute muscular rheumatism, and apoplexy. The diseases which are met with more rarely in winter than at any other period of the year, are bilious and intermittent fevers and acute articular rheumatism; but we must remember that in the last of these complaints, the differences in each season are not in general very remarkable.

2nd. Spring (*March, April, May*).—This period of the year is composed of two rainy months, and of one month (March) in which the temperature is sometimes high and sometimes cold, so that altogether the season may be considered as damp and variable. The number of entries in this season is not so considerable as in the other quarters, for it is only the acute and chronic pulmonary catarrhs which attain their maximum of frequency during the spring, whilst apoplexy, erysipelas, typhoid fevers, and acute articular rheumatism, are more unusual during the spring than at any other period of the year.

3rd. Summer (*June, July, and August*).—The three hottest months in the year are those which furnish the greatest number of patients, by which I do not mean that the number of patients assembled at the same time in the hospital is the most considerable at this period of the year, because in the hot season diseases are usually shorter and more acute, and convalescence less tedious; so that during the summer we have often had fewer patients at a time than during the winter, though the number of entries has been more considerable in the former than in the latter season.

The prevailing complaints in summer are, erysipelas, acute articular rheumatism, sciatica, and bilious, typhoid, and intermittent fevers. Those most rarely met with in summer are, acute muscular rheumatism and chronic pulmonary catarrh.

4th. Autumn (*September, October, November*).—A gradual decrease of temperature, fogs, and rainy weather, characterise this period of the year. This season, which, to judge of it from our own sensations, and from the generally received opinion, would appear very unhealthy, is on the contrary the time of year in which we meet with the smallest number of patients, and the lowest mortality.

One disorder only, acute articular rheumatism, appears to have a certain degree of frequency in autumn, though its maximum does not belong to that season alone, since the same amount of frequency is observed in summer. The diseases which are met with more rarely in autumn than at any other period of the year, are acute pulmonary catarrh, pneumonia, sciatica, and catarrhal fevers.

PART V.

ARTICLE XV.

REPORT

UPON

THE INFLUENZA OR EPIDEMIC CATARRH

OF

THE WINTER OF 1836–37.

BY ROBERT J. N. STREETEN, M. D.;

WITH

OBSERVATIONS UPON THE METEOROLOGICAL PHENOMENA,

BY WM. ADDISON, ESQ., F.L.S.

At the close of the epidemic catarrh which prevailed so extensively in the months of January, February, and March, of the year 1837, the Council of the Provincial Medical Association issued a circular to the members, requesting information respecting the origin, progress, and duration of the epidemic, its symptoms and treatment, the atmospheric phenomena attending and preceding it, together with such other particulars as might be necessary for the elucidation of many questions of interest immediately connected with it. The following were the questions to which the Council

more especially directed the attention of the Society, and upon which they were desirous of obtaining explicit information :—

1 —When did the Influenza appear in your neighbourhood? and how long did it prevail there?

2.—Did it attack a great many individuals at the same time?

3.—Did it appear partial to any age, sex, or temperament? or did it appear to attack all indiscriminately?

4 —Was it milder when it attacked children?

5.—What age appeared to suffer most from it?

6.—Was the spread of the distemper very extensive in your neighbourhood?

7.—What was the proportion of deaths to the number attacked?

8.—What circumstances predisposed the patients to a fatal termination of the disease?

9.—What was the ordinary duration of the disease?

10.—Were relapses common?

11.—Were persons whose occupations exposed them to the vicissitudes of the weather in the open air, more liable to the distemper than those who were confined chiefly to the house?

12.—Are you in possession of any proof of its having been communicated from one person to another?

13 —In persons attacked by the epidemic, who at the time laboured under pulmonary disease, was the former malady found to be aggravated on the subsidence of the Influenza?

14.—Were there any circumstances that appeared to exempt individuals from an attack of the disease? and, in particular, did the having been attacked during the last similar epidemic of the year 1834, appear to afford any protection?

15.—What were the usual symptoms of the complaint?

16.—What unusual symptoms occurred in your practice?

17.—What was your mode of treating the disease?

18.—Did any peculiar atmospheric phenomena precede or accompany this epidemic?

At the anniversary meeting held at Cheltenham, in the month of July last, a Committee was appointed to take this subject into consideration, and to draw up a report from the answers sent in reply to the foregoing questions. These answers, though not so numerous as could have been wished, are yet sufficiently so to afford valuable information; at the same time, having been received from nearly all parts of the kingdom, they furnish data from which the influence of locality, and other causes depending thereon, in modifying the general features of the disease may be inferred.

In collating and comparing the various particulars contained in these replies, the authors of this report are of opinion that they cannot proceed better in this enquiry than by following the plan already laid down, taking the questions in the order in which they were proposed by the Council.

1. *When did the Influenza appear in your neighbourhood, and how long did it prevail there?*—The answers to this question present considerable discrepancies, some of them dating the first appearance of the epidemic as early as the third week of November, others giving the second, third, and fourth weeks of January, and one assigning for its commencement a period as late as the second of February. The dates of cessation are also as indefinite, varying from the first week in February to the month of May. All accounts, however, coincide in referring its greatest prevalence to a period extending from the middle of January to the end of the first week in February.

The following table exhibits the range of the dates assigned for the commencement and termination of the epidemic in various parts of the kingdom, which we have denominated, respectively, the northern, midland, western, southern, and eastern districts:—

District.	Commencement.	Termination.
Northern ...	Nov.—middle of Jan. ...	Feb. 8.—April.
Midland	Nov.—Jan. 16	Middle of Feb.—May 1.
Western.....	End of Dec.—Feb. 2.....	Feb.—beginning of April.
Southern.....	Middle of Dec.—middle of Jan.	Middle of Feb.—May.
Eastern	End of Dec.—beginning of Jan.	Beginning of Feb.—middle of March.

From the preceding table it is obvious that no conclusion can be drawn as to there having been any regular progression of the disease from one part of the kingdom to another; and, indeed, the individual details from which it is drawn up are too imperfect and too discrepant to warrant such a conclusion, even had the general summary of them appeared to favour it. Thus, in the northern district, in which the range of appearance in the various localities comprised within the district, is, according to the answers, from November to the middle of January; nearly the same diversity exists in the statements of different individuals residing in the same town,—Dr. Macrorie assigning November as the date of commencement, and April as that of termination, at Liverpool; while Dr. Baird and Dr. Ramsay assign the month of January as being the period of commencement, and from the 8th to the middle of February as that of termination. To prevent any imputation from resting upon the general correctness and fidelity of the answers, it may be desirable

to make some extracts from such of the replies as throw light upon the causes of this diversity of opinion. One of these causes would seem to be the latitude in which the term *Influenza* is made use of by different medical men. Dr. Baird says, "The first decided case of influenza which I met with, occurred on the 3rd day of January, and the last on the 8th of February: catarrhal complaints continued to be prevalent amongst the resident inhabitants for the three succeeding months, but their systems had either become proof against the distemper, or it had lost its intensity, for in no case could it be fairly said to be an attack of influenza. That the atmosphere of Liverpool, however, was still contaminated by the epidemic influence up to the middle and latter end of April was apparent, from the fact that many of the officers and men of the American ships, and generally the most robust, were violently attacked shortly after their arrival in port." The same also is stated to have occurred among the black sailors of ships coming from South America, and the Coast of Africa. It is not an unwarrantable assumption that the catarrhal affections here spoken of by Dr. Baird, may have been considered by other observers as connected with the prevailing epidemic. Many of the replies from other parts afford illustrations of the preceding remarks. Dr. Hastings, of Worcester, states that he had observed several more than ordinarily severe attacks of bronchitis, frequently complicated with pleuritis, during the month of December, 1836—these attacks being more fatal than in former winters—but that he did not notice any *decided* case of influenza until the 13th day of

January, 1837. Other practitioners, residing in the counties of Worcester and Warwick, seem to have considered that these bronchial attacks partook more or less, of the character of influenza, as may be inferred from the nature of their replies to this question; and it would appear that, notwithstanding that the chief prevalence of influenza was during the months of January and February, cases of catarrhal disease, amounting even to a partial epidemic, may have occurred in some localities previous to the general outbreak throughout the kingdom.

The greater number of the replies from all parts agree in assigning the early part of January (from the 3rd to the 13th,) as the period of this outbreak; but setting aside those answers in which the information upon this point is less explicit, and confined merely to the announcement of a certain date or period as that upon which the epidemic made its appearance, there is evidence to shew, or at least to lead to the inference as above stated, that a partial, and, as it were, preliminary epidemic may, in certain localities, have been the forerunner of the more general one. Mr. Rice, of Stratford-upon-Avon, distinctly states this as the result of his observation; "The influenza" he says, "appeared in this neighbourhood at two distinct periods, the first commencing the third week in November, when it continued about five weeks; the second about the 10th of January, when it continued epidemic in this town and the neighbouring villages up to the first week in March. A few cases occurred in the interval; and some cases have occurred since, and still continue (June 30th) to present themselves occasionally."

Another of the causes tending to give rise to a degree of uncertainty upon this point in the replies is the different manner in which different individuals would regard the question. Some in their answers have simply stated the date of the first case to which they themselves were called; while others appear to have given a more extended signification to the terms of the question, and have thus stated the results of general observation, rather than of their own immediate experience. In the Chichester report, which contains the results of the united experience of the medical profession of that place, this source of ambiguity is avoided, and it may, therefore, be taken as affording the most correct information as to the outbreak of the epidemic in the southern and south-eastern part of the kingdom. According to this report, "The influenza began about the middle of December, 1836, was at its height during the latter half of January and beginning of February, 1837, and ended about the first week in March. There were, however, a few cases bearing all the characters of the epidemic as early as the middle of November, but they were detached, both in regard to time and place, and, therefore, not mentioned in the account." Mr. Maul, of Southampton, bears similar testimony to the occurrence of sporadic cases previous to the general outbreak of the epidemic, to which, however, he assigns a date somewhat later than that given in the Chichester report. "A few scattered cases," he observes, "of anomalous catarrh and bronchitis occurred in my practice at the end of December, 1836. These cases increased in number at the be-

ginning of January, 1837; by the end of the first week the disease prevailed more generally, and assumed the character of an epidemic. During the second, third, and fourth weeks in January, and the first and second weeks in February, the cases became most numerous, and far exceeded anything that I had ever before met with. In the two last weeks in February they declined in number, but many individuals were more severely assailed. In March the disease again manifested itself, but rather in a modified form, and prevailed with diminished consequences through the month of April." This last statement of the re-appearance of the epidemic in the months of March and April, is consonant with the observations of several other practitioners, and may perhaps afford an explanation of the extended range given to the whole epidemic, in the replies from some of those gentlemen who have not entered into particulars upon this point.

2. *Did it attack a great many individuals at the same time?*—The replies to this question are uniformly in the affirmative, and by far the greater portion of them speak decidedly as to the simultaneous outbreak of the disorder throughout the localities to which they severally refer. Dr. Davis, of Presteign, observes that within his district, comprising a circle, the diameter of which is about fourteen miles, it was impossible to mark any progression —cases in every part of it occurring simultaneously. Mr. May, of Reading, and several other gentlemen make the same remark. Dr. Shapter, of Exeter, however, states that for the first ten days occasional cases only occurred, but that on the 18th, 19th,

20th, and 21st of January, it was a most prevailing epidemic. Mr. Bree, of Stowmarket, Mr. Maul, and some others, also refer to sporadic cases preceding the general attack. The terms in which the very great prevalence of the epidemic in all parts of the kingdom are spoken of, are most decided.

3. *Did it appear partial to any age, sex, or temperament? or did it appear to attack all indiscriminately?*—A considerable portion, amounting to more than half of the returns, answer the latter part of this question affirmatively, stating that the epidemic in its attacks was irrespective of age, sex, or temperament. Others, however, point out a certain degree of exemption, or an increased liability, as attaching to one or other of the conditions mentioned in the former part of the question:—And first, as respects age, there seems to be a very general impression that infants and young children were less the subjects of this epidemic than adults or those more advanced in life. Dr. Davis states, as the result of his experience, that persons of all ages were attacked by the epidemic except young children, those under six years of age almost entirely escaping. Dr. Baird, Mr. May, Mr. Maul, Mr. Davis, of Tenbury, Mr. Gwynne Bird, of Swansea, Mr. Fletcher, of Croydon, Dr. Grove and Mr. Sampson, of Salisbury, Dr. Barlow and Mr. Godfrey, of Bath, and other practitioners express, in terms more or less decided, the entire or comparative immunity of children from attack during the late epidemic. Mr. Appleton, of Evesham, says that of ninety-nine cases occurring during the month of January, there were only five under five years of age. Mr.

Prichard, of Leamington, gives the following statement of the ages in one hundred and seventy cases occurring in his practice :—

Under 14 years.....	26	cases,	about one-sixth.
Between 14 and 65	119	144,	about five-sixths.
Above 65	25		

The Chichester report, however, makes the subjoined statement in reply to this question, "In regard to age it seems almost equally to have attacked young and old. Of cases recorded, the greater number appears to be at the periods under ten, and from thirty to forty, but the difference in the intermediate decades was trifling, and the uniformly decreasing numbers beyond forty, would probably about tally with the small population of those ages."

It does not fall within the province of the authors of this report to decide which of these views,—that children were equally liable to, or comparatively exempt from, the attacks of the late epidemic,—is the correct one; but they may observe, that notwithstanding the high value to be placed upon the Chichester report, as embracing the united experience of the medical practitioners of that city and neighbourhood, and the support which this obtains from the experience of Dr. Brown, of Sunderland, Dr. Hastings, and other eminent individuals, who state unreservedly that persons of all ages were attacked indiscriminately, their own experience would lead them to say that young children had manifested less liability to the attacks of the recent epidemic catarrh, than individuals more advanced in life. With one or two

exceptions, it does not appear from the replies that the aged were the subjects of the influenza more than adults of an earlier period of life.

Secondly, as respects sex and temperament, there seems to have been, for the most part, no appreciable difference in respect of liability to the disease. Mr. Myles, of Warrington, indeed, in his reply to this question, says that "those in the meridian of life, whose temperament was melancholic, principally males," were more liable than others; and Dr. Macrorie considers the feeble and those of the lymphatic temperament to have been most subject to attack. The Chichester report gives the following statement:—"In regard to sex it seems to have had no great partiality. Of the entire number of recorded cases, the males to the females are as fourteen to nineteen; but the reports of parish practice give a very nearly equal share of each. It should perhaps be mentioned, that of one hundred and fifty-five cases in the parishes of Chichester and its suburbs, (population between nine and ten thousand,) eighty-two were males, and seventy-three females. In the Manhood (?) district, (population four thousand,) of twenty-two cases nineteen were males, and three females. In this district not one patient was under thirty. In the Donnington district, (population three thousand,) of sixty cases twenty-two were males, and thirty-eight females; twenty-six were under thirty, and nineteen under ten years." This statement is in itself quite sufficient to shew, in accordance with an ascertained principle in statistical enquiries, that the apparent exceptions derived from the limited

experience of one individual, or one locality, must not be taken into account in deriving the general conclusion. It is only the accumulation of facts by numerous observers, from a great extent of country, or a considerable period of time, which can enable us to correct the errors of a partial or limited experience, and to arrive at conclusions founded on truth.

It should perhaps be mentioned, in connection with this question, that some of the replies state the liability to the disease to have been greater in those subject to chronic bronchitis, and in those of debilitated constitutions generally.

4. *Was it milder when it attacked children?*—At least three-fourths of the returns answer this question in the affirmative. There are, however, some exceptions of importance. Dr. Fife, of Newcastle-upon-Tyne, states that some of the most severe cases which he witnessed, occurred during the period of dentition, from the age of six months to the third year; and Dr. Shapter says that it was certainly not milder among children, but was, on the contrary, very fatal to them. Mr. Ceely, of Aylesbury, reports that, except in *very young children,* it appeared to him to be rather milder in the young than in those more advanced in life. Mr. Nott, of Bew Regis, makes a similar exception; and Dr. Clendinning, of London, states, in reply to this question, that, "except in the cases of very young or of unhealthy children, it was mild." It would seem, therefore, upon the whole, that the epidemic generally assumed a mild character when it attacked the young, but that cases of considerable severity

were not uncommon among very young children and infants. This is readily accounted for by the predisposition which exists at an early age to bronchitis and to convulsive attacks. Thus, at Reading, according to the report of Mr. May, the disease appears to have assumed amongst children the characters of severe bronchitis or pneumonia; while Dr. Brown, reports that he beheld the death of three infants, and heard of other fatal cases at this period of life, all of whom died with symptoms of cerebral congestion.

5. *What age appeared to suffer most from it?*—The answers to this question are almost unanimous in the statement that the aged suffered most from the attacks of the epidemic; and next to the aged, it is remarked in several of the replies, that infants or very young children were most severely affected. Some practitioners, however, make a distinction between the severity of the symptoms, and the fatality of the disease; and, according to these gentlemen, the actual suffering would seem to have been greater among the robust, and adults of middle age, although, at the same time, they state the disease to have been most fatal to the aged. It is proper to observe, that this severity of suffering in the robust and those of middle age, was by no means general, as the subjoined extract from the replies sent in by Dr. Hastings sufficiently testifies. In answer to this query he says, "From sixty upwards. I answer this question most unhesitatingly. Under the age of sixty, persons, male as well as female, required many of them but slight attention to get safely, and in a few days, through the malady;

but all of those, indiscriminately, male and female, who were so far advanced as sixty, suffered most severely, and had a long and dangerous illness, being confined to bed with cough and copious expectoration for some time. Of twelve persons above the age of sixty attacked, all were in bed for a week, all suffered most severely from profuse muco-purulent expectoration, all became considerably emaciated; eight were in bed for a fortnight, and had a dry tongue, with small feeble pulse; four were in bed for a month, all the time so critically ill that I scarcely expected them to live from day to day; and two died within nine days of the attack. The four old persons who were in bed a month have not yet* quite recovered, and neither of them left the house till the month of June. Among the persons attacked below sixty, although in number thirteen times more than those above that age, I had comparatively few that were in bed a week, and those were persons who had been previously ill either with pulmonary or other complaints."

6. *Was the spread of the distemper very extensive in your neighbourhood?*—The answers to this question are uniformly in the affirmative; the terms in which the prevalence of the epidemic in all parts of the kingdom is spoken of, being most decided. "I never knew an epidemic prevail so extensively"—"Whole families in bed together"—"It was indeed a general disease"—"Very few persons indeed that escaped"—"Almost general"—"It would be difficult to point out an individual who had not the

* The communication bears no date, but we believe it to have been forwarded to the Committee in July or August last.

disease," &c., are expressions taken indiscriminately from the replies, and furnish most conclusive evidence as to the wide spread and almost universal influence of the causes which gave rise to this epidemic.

7. *What was the proportion of deaths to the numbers attacked?*—The replies to this question, as might be expected from the circumstance of accurate numerical records not having been in every instance preserved, are extremely indefinite. It will still appear, however, that an approximation to the correct ratio is capable of being deduced. Several of the returns afford numerical details, giving the number of cases attended, and the number of deaths which ensued. Others afford a mere statement of the proportion which the deaths bore to the cases;—a statement which, although less satisfactory than the more explicit details, may be presumed for the most part to have been made with due consideration. In those returns in which the actual numbers are given, the total of the cases is 2347; of the deaths, 54. These were distributed in the several districts as follows:—

District.	Deaths.	Cases.	Proportion.
Northern	3	171	1 in 57, or 1.7 per cent.
Midland	22	932	1 in 42, or 2.3 ———
Western	4	73	1 in 18, or 5.5 ———
Southern	25	1171	1 in 47, or 2.1 ———
Total	54	2347	1 in 43, or 2.3 ———

The returns from the eastern district do not give any precise numerical statements.

Omitting the western district, in which the number of cases actually reported is so small, there is no

great difference in the general result, and thus, as far as these data go, the conclusion may be drawn that the proportional mortality of the epidemic was about one in fifty of those attacked. This agrees remarkably with the estimate formed by the greater number of those who have not given a precise numerical statement. Thus, in two of the returns from the eastern part of the country, Kenninghall and Burnham, the deaths are stated to be about one in fifty, and about two and a half per cent. of the cases; and the Chichester report estimates them as being from about one in forty to about one in fifty. Others of the returns give the proportion of about one in a hundred, or even a smaller ratio, while Mr. Bree, did not see a single fatal case, although he thinks he could not have attended less than five hundred persons affected with the disease. The general result, however, as we have stated, affords a ratio of mortality of from two to two and a half per cent. of those attacked, whether the numerical statements are taken as a guide, or the estimate deduced from the aggregate experience of those who have furnished the replies.

In two or three of the returns an attempt is made to throw some light upon the actual mortality resulting from influenza, by comparison of the parish registers for the period during which it was prevalent, with the corresponding period of one or more preceding years. Dr. Brown states "that the funerals in the different parish churches of Sunderland were doubled in January during the height of the epidemic; but that in February, when it was declining, though still existing, they exceeded but little the ordi-

nary average." From a valuable statistical table sent by Dr. Black, of Bolton, it appears that there were four hundred and twenty burials at the parish church of Bolton during the months of January, February, and March, of the year 1837, being an excess of one hundred and thirty-two over the average for the same months of the five preceding years. In Bolton, however, this increase in the number of burials seems to have occurred for the most part during the month of February, as is shewn by the following table :—

	1837.	Average of five preceding years.	Excess.
January	115	111.2	3.8
February	205	79.0	126.0
March	100	97.8	2.2
Total	420	288.0	132.0

The only other return which furnishes any information of a similar character, is that of Dr. Shapter, who says that in the two large burying-grounds belonging to the city of Exeter, the registered number of burials during the months of January and February, 1837, were two hundred and twenty-seven, whilst in the corresponding months of the year 1836, they were only one hundred and twenty-five, giving an increase of one hundred and two as probably owing to the prevalence of influenza during that period.

8. *What circumstances predisposed the patient to a fatal termination of the disease?*—The circumstances enumerated in the replies to this question may be resolved into those which are connected with the age of the patient, the previous general

health, and the presence of, or predisposition to, actual disease. Nearly all the returns state old age to be the chief circumstance predisposing towards a fatal termination, and several of them add infancy as next in importance to old age. Many of the returns specify debility of constitution, without evident disease, from whatever cause arising, as materially conducing to a fatal result. But next to old age, previously existing disease of the pulmonary organs would seem from the returns to afford grounds for an unfavourable prognosis. Chronic pulmonary disease, chronic thoracic disease, affections of the lungs and heart generally, are mentioned as circumstances rendering the attacks of the epidemic more likely to prove fatal; and among those diseases which are more specifically characterized, bronchitis and asthma hold the first place. Some difference, however, in this respect would seem to have existed at different periods of life. Dr. Shapter observes, that "the circumstances which particularly predisposed to a fatal termination were, amongst children, hooping cough, and the recently having had some of the infantile eruptive diseases, which prevailed very much during the preceding November and December; amongst the more advanced in life, pectoral weaknesses generally, but more especially asthma." Dr. Brown, again, remarks: "Besides the time of life, old age, and infancy already mentioned, chronic thoracic disease, or peculiar proneness to such disease predisposed the patients to a fatal termination. Of the aged persons who died, in almost all there was some previously existing disease, generally chronic bronchitis, affection of the heart, or both

conjointly. Of the young and middle-aged who *ultimately* fell victims, the majority died of phthisis, leading me to suppose that a tubercular diathesis pre-existed, and in such cases there were either previous indications of pulmonary disease, or a family tendency to it." Dr. Brown adds, that " of all circumstances which predisposed to a fatal event, neglect or mismanagement of the disease in its early stage was the most influential," a statement confirmed by Dr. M'Cabe, of Cheltenham, who forcibly points out the mischief which arose from the empirical use of stimulants and other remedies recommended at the time in the public press.

9. *What was the ordinary duration of the disease?* —From a careful consideration of the answers to this query, it appears that the disease may be divided into two stages,—one which may be termed the acute stage, lasting generally from two to four or five days, the disease frequently terminating altogether at the end of this period; and a second or more chronic stage, in which the symptoms continued in a slighter form for a period, varying from five to ten days, or even a fortnight more. In addition to this, however, a state of debility seems to have hung over many of those who suffered, for an indefinite period. These circumstances, taken in connection with relapses and sequelæ, will sufficiently account for the extreme variation in the replies to this question, the greater number of which, however, give in general terms from five days or a week to a fortnight as the ordinary duration of the symptoms. Dr. Hastings, Mr. Rice, and several other gentlemen, observed that the duration of the disease was

very various in different individuals, and Dr. Baird states that it was much longer in the aged, than in persons of the middle period of life.

10. *Were relapses common?*—This is one of the queries, in the replies to which much difference exists. The diversity is probably owing in many instances to the vague and indefinite nature of all information of this kind which is not founded upon numerical data. The language of the Chichester report, which bears every evidence of having been drawn up from such data, although in the present instance it does not give the details, is strongly corroborative of this remark. "Relapses," it is stated, "were very frequent, but probably in relation to the entire number of attacks, not very numerous: when they occurred, they were generally severe." One only of the returns gives a proportionate statement, that of Dr. Hastings, who assigns one in twenty-one as the proportion borne by the relapses to the primary attacks in his practice. The following are among the chief localities in which relapses are stated to have been of frequent occurrence:—Sunderland, Newcastle-upon-Tyne, Leicester, Stratford-upon-Avon, Stroud, Holywell, Presteign, Hereford, Kenninghall, Framlingham, Burnham, Chichester, Southampton, and Bath. Dr. Fife and Dr. Davis state that in some of their cases relapses occurred as many as three and even four times.

At Liverpool, also, according to Dr. Ramsay, secondary attacks were very frequent, but Dr. Baird is of a different opinion, and Dr. Macrorie, whose opportunities of observation are very extensive,

states that in his practice relapses were not common. In the midland counties generally, secondary attacks of the epidemic appear to have been of less frequent occurrence, the greater portion of the replies to this question, from the midland distict, being decidedly in the negative.

The symptoms are stated in several of the returns to have been more severe in the relapses than in the primary attacks, and Dr. Shapter thinks that they were modified also in their nature.

11. *Were persons whose occupations exposed them to the vicissitudes of the weather in the open air, more liable to the distemper than those who were confined chiefly to the house?*—The answers from all parts of the country are, with scarcely an exception, in the negative, and from the expressions made use of in several of the returns, it would even seem that those exposed to the vicissitudes of the weather, had been somewhat less liable to attack than those whose occupations did not subject them to such exposure. "I do not think," says Dr. Brown, "that seclusion from vicissitudes of the weather in the open air, diminished at all the liability to attacks; indeed, the few instances of exemption from this epidemic which fell under my observation, appeared generally to be in the instance of persons very constantly exposed to such vicissitudes, excepting during the hours of repose." Dr. Baird states that some of the most severe cases which he met with, were in aged females previously confined to the house. Dr. Hastings saw one lady, eighty years of age, who had not been down stairs for forty years, who had the disease very severely, though

she ultimately recovered. Mr. Davis, of Tenbury, observes, "that exposure to atmospheric changes did not appear to exert any influence in rendering the person liable to the disorder, some of the worst cases occurring in those who led sedentary lives." Mr. Smith, of Stroud, says, "I think those most exposed to the vicissitudes of the weather, that is, those continually in the open air, were less susceptible of it." Dr. Davis, of Presteign, writes that as far as his observations went, exposure made little difference, and, indeed, that a majority of the cases requiring medical treatment, were delicate persons shut up in houses on account of the cold.

The exceptions to this very general statement are few, but at the same time sufficiently important to require notice. Thus, Mr. Ceeley reports that "persons exposed to the vicissitudes of the weather in the open air, were certainly more liable to attacks; yet a slight exposure to cold, in numerous instances, appeared sufficient to give rise to an attack." He adds, "a few cases occurred in patients confined to bed with other disorders." Mr. Bird, of Hereford, says, "From the disease attacking a greater number of males than females, I should say those persons whose occupations exposed them to the vicissitudes of the weather in the open air, were more liable to the distemper than those who were confined chiefly to the house." Dr. Clendinning also enumerates exposure to the vicissitudes of the weather among the causes which rendered persons predisposed or liable to the attacks of the epidemic; and Mr. Myles thinks that the exposed suffered more severely.

But however we may feel disposed to place reliance upon the observations and opinions of these gentlemen, the very general testimony of others, no less competent, must lead us to the conclusion that some circumstances, accidental or otherwise, have interfered in rendering the results at which they have arrived, less to be relied upon in this particular than would otherwise have been the case.

12. *Are you in possession of any proof of its having been communicated from one person to another?*— The answers to this question are also of an almost uniform tenour, the opinion of nearly all those who had the most extensive opportunities of investigating the disease, and the best means of arriving at a definite conclusion, being, that there is no proof of the existence of any contagious principle by which it was propagated from one individual to another. "A gentleman," says Dr. Brown," subject to very severe bronchial affection, and in whom I apprehended that influenza would prove very severe if he were attacked, escaped it altogether, and attributed his escape to avoiding all close intercourse with the members of his family when it prevailed among them; but as there were exceptions when no such precaution was adopted, I did not think myself justified in coming to the same conclusion." In the Chichester report it is stated, "We have no proof of the disease having been communicated from one person to another, though the patients often suspected it themselves. Our observations, however, incline us to the opposite belief. It was no uncommon circumstance for the persons who had nursed a number of influenza patients, to escape it themselves entirely."

With these statements the greater number of the returns agree; those which express any difference of opinion are the following:—Mr. Williams, of Holywell, writes that he had no decided proof of the disease being communicated from one person to another, but very strong suspicions that such might be the case. Mr. Smith, of Stroud, observes, "In some families I thought it contagious, as it affected one after another, until it had gone through the whole of a large family. I have known from seven to nine affected in this way; in other large families, only one or two had the disease, the other parts of the family not being in the least affected by it." The following statement, made by Mr. Fox, of Cerne, affords an instance of this progression in the time of attack, although that gentleman does not seem disposed to give much weight to evidence of this description: "In a family of ten persons, residing in a small and generally healthy parish, one was first attacked, on the third day two more, another on the fourth, two more on the sixth, on the ninth two: these were all children. The mother, who had been in constant attendance, and had not left the house during the whole time, was seized on the tenth day, and on the twelfth the father was seized, and had a *very slight* attack. He had during the preceding eleven days *been constantly exposed on horseback.* Many such instances could be produced, but they scarcely deserve to be called proofs." Dr. Shapter seems to lean to the idea of a contagious influence. He says, "Though in many instances it appeared not improbable that the disease was communicated by

one person to another, yet from the very general prevalence of the epidemic, any such conclusion cannot be positive." It is obvious, however, that nothing approaching to tangible evidence is afforded by any of these statements; and the only really important observation in any way favouring the idea of contagion or infection, is made by Mr. Maul, who remarked, that "if an individual came from a distance with the disease, the inhabitants of the house into which he arrived were usually attacked." Mr. Maul, however, draws no conclusion from this fact, contenting himself with simply stating it; and standing alone, as it does, the observation in itself carries little weight.

13. *In persons attacked by the epidemic, who at the time laboured under pulmonary disease, was the former malady aggravated on the subsidence of the influenza?*—This seems to have been decidedly the case, and, generally speaking, with few exceptions. According to some of the returns, however, persons affected with certain forms of pulmonary disease, would appear to have especially suffered, particularly those labouring under phthisis pulmonalis and bronchial affections. Dr. Baird, in his reply, states that it was only the purely phthisical cases which were aggravated on the subsidence of the attack. The testimony of Mr. Appleton, of Evesham, and Mr. Smith, of Stroud, is to the same effect; and Mr. Rice says that in the only instance of this kind (previous pulmonary disease) which he attended, a case of hæmoptysis, the attac proved speedily fatal. Mr. Bree, Dr. Shapter, and Dr. Clendinning, observed that the attack of the epidemic seemed to

hasten the development of phthisis or other pulmonary disease, when it had been previously latent, or when a predisposition had existed. Dr. Hastings, at the same time that he bears testimony to the facts above stated, says, "I may also remark that this is not confined to pectoral complaints. I find muco-gastritis and muco-enteritis of long standing, referred in its commencement by patients to the influenza. Wherever, in short," he continues, "any latent disorder existed in the system, the effect of the disturbance of the functions of the body by the epidemic seems frequently to have been, to call into activity disease which had been previously for a length of time dormant."

In two only of the replies is this question answered altogether in the negative, and in one of these, from Mr. Welchman, of Kineton, it is even stated that certain cases of pulmonary disease were decidedly benefitted after recovering from the epidemic. "I do not think," he observes, "any of my patients who were attacked by the epidemic, who at the time laboured under pulmonary disease, had their former malady aggravated by the more recent affection; two or three who had previously had chronic bronchitis, were decidedly free from it after recovery from the influenza." Dr. Hastings refers to a case in which he observed the same circumstance. "In a lady, who has for years been very liable to bronchial attacks, and has for many winters been under the necessity of taking great precautions as to exposure to weather, the influenza came on with great severity, and much aggravation of the usual pectoral symptoms. They did not,

however, continue longer than a week, and this lady has ever since that time been more free from pectoral complaints than for three years previously." These, however, are obviously but exceptions to the general rule.

14. *Were there any circumstances that appeared to exempt individuals from an attack of the disease? and, in particular, did the having been attacked during the last similar epidemic of the year* 1834, *appear to afford any protection?*—Several of the returns are expressed in very doubtful language in the reply to these questions, and in some of the returns they are passed over altogether. The greater number, however, agree in stating that the having undergone an attack of the previous epidemic, afforded no protection, and that there were no circumstances which appeared to exempt from an attack of the disease. With respect to the influence of the former epidemic, some practitioners would seem to think that those who had suffered from it, shewed themselves even more liable to the late epidemic than those who had escaped its attacks. Dr. Fife says, "Many of those who suffered most severely from the former epidemic, were violently affected during the late visitation. In fact," he continues, "I was almost led to believe them even more prone to attack;" and Mr. Smart, of Cranbourne, expressly states it as his opinion, "that the influenza of 1834 had rather left a susceptibility to, than protected the constitution from, the attack of the late epidemic." In many of the returns, instances are adduced of individuals having suffered severely from both epidemics; still, however, there are some few in which the

opposite opinion is stated. Mr. Appleton remarks that persons who had had the disease before, either escaped it altogether, or were but slightly affected. He adds, however, "I notice this, not as the result of my own observations in many cases." Dr. Grove, of Salisbury, states that he knew several persons formerly attacked, who were not attacked by the late epidemic; and Mr. Ceeley observes that he met with several instances of apparent exemption from an attack of the disease of 1836-7, or of a much milder attack, in those who had suffered from the influenza of 1834, or in the intervening period between the two epidemics. Mr. Ashwin, of Abergavenny, also thinks that the attack was milder in those who had had the disease during the previous epidemic. Mr. May and Mr. Maul notice that it was the popular belief that such as had been attacked previously, were protected in consequence from the recent visitation; but it does not appear that this belief received any confirmation from the personal experience of either of these gentlemen.

Among the very few circumstances mentioned in addition to an attack of the previous epidemic, as affording exemption in some cases, and modifying the severity of the symptoms in others, are,—the actual existence of other severe disease, noticed by Dr. Fife, of Newcastle, and Mr. Bloxam, of Newport; general strength of constitution and regular habits of life, by Dr. Davis and Dr. Clendinning; and the age of infancy, by Mr. Gwynne Bird.

15. *What were the usual symptoms of the complaint?*—Of the answers to this question, some are

expressed in general terms, while others go into considerable detail. From a careful consideration of the valuable information thus given, and a comparison of the several accounts, we have not been able to arrive at the conclusion that any very appreciable variation exists in the general features of the disease as it occurred in the different localities to which the returns refer. The symptoms enumerated as constituting the usual course of the complaint, may be divided into those indicating the existence of a general febrile condition of greater or less intensity, and those more immediately characteristic of the epidemic, whether purely catarrhal and resulting from an affection of the mucous lining of the pulmonary organs and air-passages, or connected with one or more of the other organs or systems of the body.

The symptoms referrible to a general febrile state were very much the same as those observed, either as precursors, or as arising in the progress of mild febrile diseases in general. Such of the returns as enter into any lengthened account of the symptoms, almost uniformly describe the disease as commencing, in mild cases, with indistinct chills; in the more severe ones, with shivering, or even actual rigor. In some instances the rigors appear not to have occurred until the second or third day of the disease; in others, to have arisen suddenly, affording the first indication of attack, and to have continued to recur at intervals during two or three days, or even for a longer period. The chills and rigors are described as alternating with heat of skin and flushing, until

the febrile state became completely developed, at which time the more peculiar features of the disorder seem in general to have shewed themselves. The fever from this period appears to have been usually of a mild open character, attended with some heat of the skin, and, occasionally, a dry imperspirable state, but more frequently there was a tendency to perspiration, which, when free, gave considerable relief. In more severe cases the morbid temperature was more urgent, the skin hot and dry, the face flushed, with mild delirium at night, and there was considerable feverish restlessness and anxiety; at the same time there was great debility and languor, with an overpowering sense of sinking, and depression of spirits. In some few cases the fever seems to have assumed a typhoid character, but no very definite account of this modification is given. Nearly all the returns mention general pains, or pain and soreness of the back and limbs, and of other parts of the body, as among the most well-marked symptoms. These pains may, in part at least, be considered as appertaining to the general febrile state; but the pain of the back and loins in particular, was so very generally felt, was in many cases of such extreme severity, and so prolonged in its duration, and, in almost all, gave rise to so much inconvenience and distress, being complained of more than any other symptom, that it is certainly to be classed rather as one of the symptoms especially characteristic of the epidemic, than as connected merely with an ordinary febrile condition.

The catarrhal symptoms, to which we have next

to direct attention, were, according to the returns, a suffused state of the eyes with discharge of tears; sneezing; tingling of, and acrid discharge from the nostrils; sense of weight and pain of forehead; soreness of the fauces; hoarseness; cough; expectoration; dyspnœa; and pain and sense of constriction about the throat and chest. Several of these symptoms are lightly passed over, and appear to have been either not of very general occurrence, or so trivial as to be thought not of sufficient consequence to be recorded. The suffused state of the eyes does not appear to have been commonly observed; sneezing and watery discharge from the nostrils are more frequently mentioned; but the sense of weight and frontal headache were very prominently marked, being recorded in almost all the returns. In many cases the pain was exceedingly severe and distressing to the patient, and by no means confined to the frontal region, extending to the vertex and occiput, and over the head generally. It is in connection with this severe form that giddiness, delirium at night, and, in one instance, deafness, were noticed. The headache is variously described as violent,—severe,—intense,—oppressive, &c. Mr. Ceeley says, "It was frequently complained of as unlike in nature and degree to anything ever before experienced." Mr. Bree remarks, "The pain in the head was generally supra-orbital, and, for a short time, very sevère; in three cases there was delirium, and in one decided meningitis."

The soreness or rawness of the fauces is only occasionally alluded to, and, in some cases at least, seems to have been observed more particu-

larly in connection with the more marked symptoms of coryza. The Chichester report, in which "defluxion at the nose and eyes, sneezing and frequent epistaxis," are mentioned as prominent symptoms of the disease as it appeared in that city and neighbourhood, describes the fauces as being "generally red and tender," which state in some cases ended in quinsey. Dr. Fife also noticed inflamed pharynx and tonsils as being among the symptoms of the disease observed at Newcastle; and Dr. Shapter alludes, among other symptoms, to a sensation of painful rawness of the fauces and trachea as quickly following frontal pain, sneezing, and "a very copious flow of a thin acrid discharge, chiefly from the membrane of the nose."

The sense of tightness or constriction about the throat and chest, with more or less soreness beneath the sternum, is very generally noticed in the replies; but the symptom to which the greatest prominence is given is the cough, which is variously described as being short and harrassing, troublesome and frequent,—harrassing and incessant,—preventing sleep,—very distressing from its aggravating the pain of the head,—sometimes as severe,—violent,—or coming on in frequent paroxysms of long duration. Mr. Smith, of Stroud, mentions that in two cases occurring in his practice, it produced hæmoptysis to an alarming extent, and that premature confinement followed in two others. The expectoration is by no means so generally noticed, but when it is mentioned, is stated to have been scanty, difficult, and consisting of clear viscid mucus at the commencement, afterwards becoming more copious and

free, opaque and muco-purulent in its character, and occasionally tinged with blood. In some cases it is described as excessive and profuse. The respiration seems to have been very generally more or less affected; in some cases short and hurried, or uneasy and oppressed, in others difficult. Pains in the chest are mentioned in some of the returns in addition to the soreness under the sternum; and in one these pains are described as having been acute and lancinating. Examination by the stethoscope, according to Dr. Shapter, revealed the existence of sonorous and sibilous *râles*, and for the most part also, a well-marked crepitation in some part of the thorax, generally in the lower portion.

The symptoms of disturbance in other organs of the body, may be briefly noticed under the following heads,—those connected with the organs of circulation,—those indicative of a disordered state of the digestive and urinary system, and those which may be referred to the nervous system. The circulation seems in almost every instance to have been in a state of depression rather than of excitement; accordingly the pulse, although usually characterized in the replies, as accelerated, frequent, quick, is at the same time stated to have been variable, small, and feeble; in two only of the returns, is it stated to have been occasionally full but soft. Mr. Ceeley remarks that in the decline of the disease in simple cases, it was slow and occasionally intermitting, and Dr. Brown also observes, that during the convalescence it was frequently slow and feeble.

The symptoms which may be referred to a de-

ranged state of the digestive and urinary systems, are pain and tension, with tenderness at the epigastrium and upper part of the abdomen; loss of appetite; thirst; nausea, and vomiting; a furred state of the tongue, and a morbid state of the alvine and urinary secretions. The oppression and tenderness of the upper part of the abdomen is noticed in several of the returns, and seems to have been often accompanied with nausea and vomiting. Dr. Barlow remarks that when the chest affections were of trifling importance, the special irritation of the epidemic appeared to be seated in the stomach and bowels, and mentions a case in which a fit of spontaneous vomiting carried off the attack, all the constitutional disturbance being well-marked but mild, without any cough or bronchial disorder. Thirst does not appear to have been a very urgent symptom. The tongue is described either as furred, white, and moist; or as loaded with a thick coating of moist yellowish fur. Occasionally it became, in the progress of the disease, brown and dry, or, as stated by Mr. Dent, of Kenninghall, "morbidly red and shining," in which case "there was a good deal of tenderness about the right iliac region." The bowels are very generally reported to have been constipated, though occasionally a relaxed state was observed. In the Chichester report is the following observation relative to this point:—"Bowels not much affected. It is, however, right to say that previous to the accession of the epidemic in the latter part of the last year, diarrhœa was rather prevalent, but ceased with the increased violence of the distemper." The

urine was observed, according to such of the returns as afford information as to the characters of this secretion, to be, for the most part, scanty and high-coloured,—rarely abundant and limpid,—sometimes becoming, during the progress of the disease, thick and reddish, or of a whey-like appearance, and depositing a copious sediment.

Among the symptoms which appear to have depended upon or been connected with a disordered state of the brain, spinal marrow, and nerves, may be enumerated, in addition to the delirium &c. before alluded to, prostration of strength, pain of the back and loins, and various neuralgic and rheumatic affections. The extreme prostration of strength, which, in many of the reports, is stated to have arisen suddenly at the very commencement of the attack, is, in almost all of them, characterized as presenting a striking feature in the disease. It seems even in some situations to have approached the collapse of the late visitation of cholera; and to have been accompanied also, notwithstanding the generally observed torpor of the intestinal canal, with a relaxed state of the bowels. Dr. Davis, of Presteign, observes that the *prostration* of *strength* was *instant and universal,* and attended *with extreme depression of spirits, and, in a vast majority of cases, spontaneous diarrhœa.* Another peculiarity in the character of this symptom is the length of time which the patients continued to labour under it, even after the cessation of the other symptoms of the disease. The pain of the back and loins is also very generally described as of peculiar severity, and seems to have been scarcely

of the same nature as the pain and sense of weariness usually attendant upon febrile disease; or if of the same nature, certainly of much greater intensity than what is commonly observed in diseases of this character. In addition to this pain, and the general pains of the limbs and soreness of the trunk before mentioned, some of the returns enumerate among the usual symptoms of the epidemic, either as attending its progress, or making their appearance upon the decline of the more acute symptoms, certain painful affections, which are variously termed rheumatic, neuralgic, or local rheumatic neuralgia. These, however, do not seem to have been of very general occurrence, and may possibly be connected with some local peculiarity: Salisbury and Aylesbury are the places in which they appear to have been most frequently observed among the ordinary symptoms.

Such is a condensed account of the usual characters of the epidemic, as far as we have been able to ascertain from the several returns; and in these characters there is little difference, upon the whole, in the statements received from different places. The most important variation is one to which no allusion has been made in the preceding statement, mentioned by Dr. Fife, who remarked that in several cases, "the parotid gland was enlarged to such an extent, as to lead to the belief that the patient was actually suffering from cynanche parotidea." This, however, does not seem to have been observed elesewhere, and must, therefore, we think, be placed among the "unusual symptoms," to which the next question refers.

We cannot better conclude this summary of the general features of the epidemic, than by extracting the following account of its progress as it presented itself at two widely separated localities, Exeter and Sunderland, with the view of exemplifying the course of the disease. "The usual symptoms of this epidemic," says Dr. Shapter, "were—first, oppressive pains of the head, especially over the region of the frontal sinusses; diffused muscular pains of the shoulders, loins, and legs; constant sneezing, early followed by a very copious flow of a thin acrid discharge, chiefly from the membrane of the nose; (the membranes of the eyes were not so greatly affected as in the influenza of 1831 and 1834.) Secondly:—These symptoms were quickly followed by an overwhelming feeling of lassitude and prostration of strength, with, in many cases, a loss of all muscular power, together with great anxiety of the præcordia, and agonizing fears of death; a sensation of painful rawness of the fauces and trachea, a voice hoarse and hollow, frequent short cough, for the most part dry, stricture and acute lancinating pains of the chest. By the stethoscope, there were heard râles, sonorous and sibilous, and almost always in some part of the thorax, generally the lower portion, a well marked crepitation. Tongue covered with a copious white mucus, with inflamed elevated papillæ showing themselves at the tip and edges. Bowels not confined and easily acted on, in fact there was rather a tendency to diarrhœa than otherwise; appetite gone; occasional thirst; pulse small, quick, but soft. Paroxysm generally severe during the night. In this stage of the disease I was seu-

sible of a peculiar and very characteristic odour proceeding from those affected; though not able properly to describe it, I may state its general character to have been that of a flat musty smell. Thirdly:—About the fifth or sixth day a mucous discharge from the nose came on, together with a muco-purulent expectoration in coughing. The various symptoms now gradually declined, leaving the patients in a state of great general weakness, together with a peculiar aching feel, and loss of power in the muscles of the legs."

Dr. Brown's statement is as follows:—"The tongue was white and considerably swollen; the fauces were inflamed; the eyes were often injected; the nostrils felt hot and irritated, with abundant thin secretion; and there was pain across the forehead in the situation of the frontal sinusses. A sense of heat and irritation extended down the trachea to the thorax, where, besides, there was a feeling of constriction; there was cough, very distressing from its aggravating the pain of the head; it was dry at first, but soon became attended by a copious mucous secretion, often opaque and straw-coloured, sometimes with slight streaks of blood; and, in some cases, there was a considerable degree of dyspnœa. Sickness and vomiting were very common symptoms, especially at the commencement of the disease; and there was sometimes (especially in relapsed attacks,) acute pain in the lower part of the abdomen, aggravated by pressure. There was much thirst, total want of appetite, and the sense of taste was impaired and vitiated. The urine was scanty and high-coloured, and, on standing, speedily deposited a

very abundant lateritious sediment. The pulse was in general soft, but not deficient in strength; it was frequent, but not considerably so, from 80 to 100 being its average range. When convalescence was approaching, or had taken place, it often became unusually slow, even below 50, and was feeble. There were the ordinary febrile feelings of bodily and mental oppression, and pain and weariness in the back and limbs. The skin, in the early stage of the disease, was warm and generally moist; towards the close, cool, if not cold, and moist. In bad cases, where the dyspnœa was considerable, the advanced stage of the disease, with the cold and wet skin, and blueish hue of the countenance, often recalled to my mind the collapsed stage of cholera.

This description will be understood to apply, where exceptions are not stated, to cases of the ordinary severity. Like all epidemics, influenza has a wide range of intensity, being, in many cases, a very dangerous disease, in others, little more severe than an ordinary catarrh."

16. *What unusual symptoms occurred in your practice?*—As might be anticipated, certain symptoms enumerated as of occasional occurrence in some of the replies to the former question, are mentioned in others under the present question as unusual symptoms of the complaint. This is especially the case with the more severe cerebral affections, and also with acute bronchial and pneumonic inflammations, with certain abdominal affections, and with rheumatic and neuralgic pains. On this account it might perhaps have been advisable to throw the answers to this and the preceding ques-

tion into one: still, however, it seemed desirable to preserve the mode of inquiry pointed out by the Council unbroken, and a comparison of the statements severally drawn up from the answers to these questions, will sufficiently fulfil the object of pointing out those symptoms which, upon a general view of the whole phenomena, may be considered as unusual. At the same time, the occurrence of such symptoms among the usual characteristics of the disease, indicates that under certain circumstances, and in certain situations, they assumed such a degree of prevalence as in some measure to modify its general type.

Among the most prominent and important of these unusual symptoms of the complaint, or rather of the variations from the usual type presented by the epidemic, must be classed those indicative of severe affection of the cerebral organs. Dr. Brown mentions the occurrence of three fatal cases of meningitis in adults, to which he had been summoned in the advanced stage, and which appeared to him to have originated in a neglected inflammatory affection of the lining of the nostrils and frontal sinusses. Dr. Hastings knew of one instance of meningitis, in which, however, the disease was subdued by the use of bleeding and purgatives, and other appropriate remedies. In this case the individual had been in a state of considerable anxiety of mind previous to the attack. Another instance is also referred to, where insanity succeeded to the attack of the epidemic, and lasted several weeks. Mr. Godfrey, of Bath, mentions acute pain in the head, in a few cases so severe as to last

above a week, and then only relieved by a copious discharge of pus from the ear; and Mr. Fox, of Cerne Abbas, notices abscesses of the ear among the unusual symptoms. Symptoms of pressure on the brain are also enumerated as of occasional occurrence. The Chichester report, in answer to this question, is as follows:—"There was delirium occasionally. In some cases the speech was affected, so that the patient was unable to articulate; in a few cases there was coma at the outset, which soon went off." "In one case," writes Dr. Fife, "the disease at its commencement appeared to be apoplexy; in another, partial paralysis existed. In this case," he adds, "perhaps the term paralysis may not be justified, as it rather consisted in the inordinate or spasmodic action of the extremes of the fingers and thumbs of the hands, than in loss of power in the flexors." Dr. Hastings also saw one instance in which apoplectic symptoms occurred, but without subsequent paralysis. Mr. Ceeley observed, that "in a few old and feeble persons the primary effect on the sensorium resembled a sudden apoplectic seizure, from which, by sinapisms and diffusible stimulants, they slowly recovered, with fever and the usual affection of the mucous membrane of the air-passages; one of these cases, however, proved fatal in four days from its commencement." And Mr. Fox states that in a few cases there was sudden insensibility, continuing from one to two hours. The same gentleman also observes that there were some instances of boys dropping down in the fields while ploughing, a circumstance, however, to be attributed rather to sudden exhaustion,

or to the shock upon the nervous system generally, than to any influence acting more immediately upon the brain alone. Convulsive attacks were noticed in some instances by Dr. Ramsay; and Mr. Appleton mentions inflammation of the spinal marrow as having occurred in some cases which had not received early attention.

Inflammatory affections of the lungs are included in certain of the returns, under the unusual symptoms of the disease These affections, however, appear, for the most part, to have arisen, either in neglected cases, in those previously predisposed to pulmonary disease, or in aged persons, and are perhaps rather to be regarded as the effects of the disease acting upon unfavourable constitutions. It may be observed, in connection with this subject, that Mr. Godfrey saw three cases of pneumonia, in which he used the lancet freely, and upon the subsidence of the inflammatory symptoms, the usual symptoms of the influenza continued.

Among the symptoms indicating unusual affection of the circulatory system as connected with this epidemic, are syncope and intermittent pulse. Dr. Ramsay states that syncope was not an unusual occurrence in his practice, and Mr. Godfrey noticed the same symptom. Intermittent pulse is mentioned by Dr. Baird only.

Unusual symptoms connected with the abdominal organs are more frequently alluded to. Dr. Brown mentions excessive pain in the abdomen, generally situated mid-way between the umbilicus and symphisis pubis, as of frequent occurrence in relapsed cases. It was sometimes associated with

obstinate constipation, at others with mucous and sanguinolent stools, resembling in their appearance and the manner of their expulsion those of dysentery. Mr. Appleton observed amongst the ill-fed and ill clothed, considerable disturbance of the biliary functions, with looseness in the early onset of the disorder. In others of the returns, however, this relaxed state in the commencement of the disease was noticed as of usual occurrence, although the greater number agree in stating that the bowels were generally constipated. Mr. Ceeley remarks, that in his practice a few cases occurred in which there was more affection of the mucous membrane of the intestines than of that of the bronchi. Diarrhœa is also enumerated among the unusual symptoms attendant upon the epidemic by Mr. Bloxam and Mr. Sampson; and Dr. Shapter notices three cases of gastro-enteric affection as the only peculiarity occurring in his experience of the epidemic. Mr. Bird, of Hereford, observed pain of the pubic region and retention of urine: these last symptoms, however, are probably to be considered only as an accidental complication.

Rheumatic and neuralgic pains were mentioned under the preceding question, as constituting, in certain situations, a usual feature in the disease. In other localities, symptoms of this description were also observed to occur in some instances, and are noticed in the returns in reply to the question now under consideration. Dr. Brown mentions as an irregularity next in point of frequency to the abdominal affections, "pain of the head, often wearing the aspect of neuralgia of the branches of

the fifth pair. It remitted," he observes, "but never totally intermitted. It was often associated with inflammation of the lining of the nostrils and frontal sinusses; indeed, it was not always easy to discover whether the pain did not purely depend on this inflammation. In some cases it yielded to arsenical solution or other remedies of neuralgia." Intermittent pain in the head and temples, and sudden attacks of pain in different parts of the body in a most acute degree, are mentioned by Mr. Rice, and were probably of a similar character. Mr. Bree writes, "A frequent symptom in females only I found to be a neuralgic affection on one side of the face, similar to that produced by decayed teeth, and which also affected the hearing of the same side. I had in several cases also a similar pain though more acute, affecting the parietes of the chest, which produced disorder of the respiration, and if not carefully observed, might have been mistaken for pleuritis." Mr. Davis, of Tenbury, states, that in three or four cases he observed acute rheumatism as an accompaniment of the disease, and Mr. Gwynne Bird, that it was often followed by rheumatism. Rheumatic or neuralgic pains were also observed by Mr. Smart, of Cranbourne, who considers that the disease assumed three different types. "In one there was merely a spasmodic cough, with symptoms of a common cold; in a second, all these symptoms were increased so as to resemble bronchitis or fever; in a third, there were rheumatic or neuralgic pains of the head or neck."

The only other peculiarity requiring notice here, is soreness of the lips, mouth, and fauces, of unusual

severity, which both Mr. Godfrey and Mr. Rice mention as having occurred in their practice. The latter of these gentlemen also observed *spontaneous* ptyalism in connection with the tenderness of the gums and mucous membrane of the mouth and fauces.

It should be observed, that a considerable number of the replies state, in answer to this question, that no unusual symptoms occurred in the experience of the writer.

17. *What was your mode of treating the disease?*—In the general plan of management adopted during the epidemic, there appears to have been little difference, certain principles of treatment being laid down in nearly all the returns. The main features of this plan are, a very cautious employment of evacuant remedies in general; the use of diaphoretics and mild aperients in the earlier stage, with a diluent diet, regulated temperature, and cessation from all active pursuits; in the more severe cases, occasional local bleeding and counter irritants to the throat and chest, and confinement to bed. In the second stage, expectorant and anodyne medicines, with sulphate of quinine or mild tonics where there was much debility remaining, are most commonly recommended; in the relapses, a more active treatment, with a freer use of evacuant remedies; and in complications with acute bronchitis, pneumonia, muco-enteritis, or cerebral disease,—venesection, leeches, blisters, mercurials, cathartics, or other remedies called for by the nature of the symptoms complicating the disease, though perhaps, as far as depletion is concerned, with less freedom

than would have been required had no epidemic influence existed.

The abstraction of blood by venesection was very rarely had recourse to, and is almost always spoken of as a measure of doubtful propriety; in some instances as having proved positively injurious. Dr. Fife says, "*General blood-letting, in the abstract,* I am decidedly of opinion is seldom required, and very frequently most injurious in its effect." Mr. Rice writes, "I very seldom used the lancet, in not more than six cases, and in only two of them am I satisfied that it did not do mischief." Dr. Davis observes, "Venesection was always mischievous, and even local bleeding, by leeches and cupping, was not well borne." Mr. Ashwin says, "Bleeding was always regretted when used." "In no case," says Dr. Shapter, "did depleting or severe purging hold out encouragement for a continuance of such means;" and Dr. Barlow remarks that, "for the ordinary disease blood-letting was neither required nor borne." "Some practitioners," he continues, "bled in the beginning, but were soon obliged to desist, faintness being induced by small loss of blood, and great weakness ensuing. Cases did occur, however, which required bleeding, and when the disease passed into pneumonia, as occasionally happened, as active treatment was necessary as if no epidemic existed." Dr. Baird, Mr. Davis of Tenbury, Mr. Prichard, Mr. Bree, and other practitioners, never employed general blood-letting; and the almost unanimous testimony is, that this measure was seldom had recourse to, except in active inflammation of the pulmonary organs. The

following is the statement of the Chichester report upon this question:—"Except in severe attacks blood-letting was not required, and when it was tried, it frequently seemed to weaken without benefit. Detraction of blood was, however, practised with benefit in some cases where the pulse indicated an active and acute state of inflammation. The number of severe cases, however, calling for active treatment, was very small. It is right to state, that a very small quantity of blood drawn from the schneiderian membrane, relieved the distressing headache in a marked manner; even a few drops accidentally flowing in two cases gave almost instantaneous relief."

The local detraction of blood, by leeches or cupping, is more frequently recommended; though even in this manner, depletion to any extent is discouraged, and seems to have been rarely practised. The plan of drawing blood from the mucous lining of the nostrils, mentioned in the Chichester report, is also spoken of in terms of commendation by Mr. Prichard. Counter irritation, by means of blisters, sinapisms, stimulating plasters and liniments, warm cataplasms, &c., is very generally mentioned in the returns as proving of service, more especially in the early stage of the complaint, and in aged persons. These remedies were applied to the throat, chest, pit of the stomach, or interscapular region, according to the varying circumstances which called for their use.

Of internal remedies, emetics are spoken of, in a few of the returns, as productive of considerable benefit at the onset of the disease; but the measures

most generally recommended, are the exhibition of mild aperients and saline diaphoretics. In some of the returns more active cathartics are stated to have been given with advantage; in others, a combination of antimonials, ipecacuanha, or squill, with the saline diaphoretics. Anodynes are also recommended in some of the returns as of use in allaying the cough. Of these hyoscyamus, acetate and muriate of morphia, and opiates generally, were most frequently employed; but conium and colchicum are also mentioned. Some difference of opinion, would seem to exist as to the benefit derived from remedies of this description. Mr. Ashwin gives it as his opinion that opiates were, at least, useless, and from the silence of a considerable portion of the returns respecting them, it may be inferred that they were by no means generally employed. Dr. Barlow, however, has the following observation upon the subject:—"Some practitioners withheld opium and had protracted disease, as I had occasion to witness. There being no counter indications I combined it throughout, and with decided advantage." The exhibition of tonics and stimulants is also a point of practice upon which some diversity of opinion has existed. In consequence of an extensive empirical use of such remedies in the early stage of the disease, arising from the mischievous reliance too often placed upon the public press, serious, and even fatal effects, were in many instances observed. Dr. Mac Cabe brings forward examples of this mischief, and other practitioners agree with him in pointing out the injurious tendency of the indiscriminate

employment of these remedies. From the silence of the returns, it may be inferred that many practitioners, for the most part, withheld tonics and stimulants altogether. Others, however, state that considerable benefit was derived from the use of sulphate of quinine in the debility remaining during the decline of the disease, and in the convalescence; and some even recommend ammonia, wine, and other more active stimulants, in cases where the debility was extreme, and in aged persons. Mr. Myles says that in old people, when the cough was a prominent symptom, he found a blister to the chest, with the sulphate of quinine internally, to act as a specific in all the cases which he attended. Dr. Baird was in the habit of administering, in the more severe cases occurring among the aged, asthmatics, or those affected with chronic pulmonary complaints, a grain of the sulphate of quinine at intervals, alternately with calomel and tartarized antimony, continuing the quinine, or some other light tonic, without the mercurial when the mouth became affected, and states that after the adoption of this plan of treatment, he had no fatal case, nor had occasion to resort, in a single instance, to bleeding, leeching, or cupping. In the intermittent pains again, in which it might have been presumed that quinine would have proved most beneficial, Mr. Rice states that he found it positively injurious, the pains being aggravated rather then alleviated by its employment.

There are two powerful remedial agents, mercury and antimony, which, in addition to their respective employment as cathartics and diaphoretics, were

occasionally used with other views, either separately, or in combination with each other, or with other remedies. Dr. Baird's practice of giving these medicines in combination has been already alluded to; the mode of administration was in the form of powder, three grains of calomel, with one grain of tartarized antimony, twice, thrice, or even four times in the twenty-four hours, the sulphate of quinine being given during the interval, as before mentioned. "The effect of the powder," he says, "was to produce extreme nausea for the space of an hour, and frequent vomiting; to cause a vast discharge of purulent looking matter from the lungs, excite a copious diaphoresis, and procure several dark pitchy evacuations from the bowels. So soon as the mouth became slightly affected by the calomel, and in many instances before this was apparent, the cough and expectoration had been greatly diminished, the restlessness had ceased, the countenance and eyes had assumed a more natural expression, the tongue had begun to clean at the edges, and the pulse returned to its natural state." Mr. Ceeley was in the habit of giving a combination of calomel, opium, and squill, in similarly severe cases, when the pulmonary organs were much congested; and several of the returns mention calomel, either alone or variously combined with James' powder, ipecacuanha, Dover's powder, opium and henbane, as being resorted to in the more severe cases. Antimony was also exhibited alone, either in the form of James' powder or of tartar emetic, to produce its nauseating and sedative effect, as appears from some of the replies. In others, however, a caution is given against its employment in this mode.

In conjunction with these measures a light, diluent, or farinaceous diet is very generally recommended, though from some of the returns one rather more nutritious seems to have been occasionally found necessary; regulated temperature, rest, and, in the more severe cases, confinement to bed are also enjoined.

18. *Did any peculiar atmospheric phenomena precede or accompany this epidemic?*—It is to be regretted that, with the exception of a valuable meteorological register forwarded by Dr. Black, of Bolton, and some important tables from Dr. Shapter,* the information given in the answers to this question is expressed in general terms. In the subjoined analysis, the division into districts, formerly mentioned, has, for obvious reasons, been adhered to.

To commence with the northern district, it appears that in Sunderland and its neighbourhood, the autumn had been cold and wet, with frequent thunder and lightning; and that at Liverpool, according to the statement of Dr. Macrorie, the weather preceding the outbreak, was unusually cold and humid. The epidemic commenced at Sunderland during an intense frost, and cold frost and snow prevailed throughout its continuance. A similar state of weather was observed at Warrington, the atmosphere being cold and humid, with winds generally from the east and north-east. Dr. Fife, however, observed no peculiar atmospheric phenomena, the disease prevailing at Newcastle during the severest frost, and in the opposite state, without any perceptible mitigation.

* See Appendix.

In the midland counties there is less mention made of the coldness of the weather, but the returns from this district remark very generally upon the extreme humidity of the atmosphere immediately preceding or during the epidemic. At Aylesbury, according to Mr. Ceeley, "the weather was very bleak, cold, and piercing just before the epidemic, and the breaking up or thawing of the immense fall of snow, seemed to attend the increase of the epidemic, but" he adds, "I look upon these phenomena as merely aggravating causes, since influenza exists in summer, and I have observed it at all periods of the year, sporadically more or less, especially on atmospheric changes, or during the prevalence of south-east and north-east winds." At Tenbury, Mr. Davis noticed that the atmosphere was remarkably humid during the prevalence of the epidemic; and an unusual quantity of rain fell in the months of January and February in that neighbourhood, producing the highest floods which are remembered to have occurred during a period of forty years. The returns from Worcester and Evesham also mention the extreme humidity of the atmosphere, both before and during the prevalence of the disease. Mr. Rice, of Stratford-upon-Avon, remarks that early in January there were two or three days of very mild weather, followed by a cold north-east wind, of which, however, he made no memorandum at the time; and Mr. Smith says that at Stroud the epidemic was ushered in with a damp warm atmosphere, which was suddenly changed to cold rain, snow, or hail, scarcely a day passing without several changes of this kind, the disease

abating as soon as the weather became more settled and warm.

The returns from the western district, which includes Wales and the counties of Hereford and Monmouth, mention a similar humid state of the atmosphere. Mr. Ashwin states that at Abergavenny severe storms of wind from the north, north-west, and north-east, with heavy rains, preceded the outbreak of the disease; and that unusual falls of snow with high winds accompanied it. Mr. Bird, of Hereford, observes that the weather was wet and damp with cold winds, and thinks that the disease prevailed most in exposed and elevated situations; he adds that the cases were certainly more severe in the country than in the city. At Holywell, there were incessant and dense fogs, which prevailed also at Presteign. "The atmosphere" says Dr. Davis, "was, throughout, dark and gloomy with frequent fogs, and the wind, for the most part, from the east or north-east." There are also two circumstances, deserving of notice, alluded to in the returns from this part of the kingdom, of which no mention is made as having been observed elsewhere. One is the occurrence of the aurora-borealis, noticed by Mr. Bird, of Swansea. The other is contained in the following extract from Dr. Davis' letter:—"A gentleman in this neighbourhood, who is a naturalist, observed a large quantity of dead flies in hollow lanes and on the surface of ponds, where they had evidently been drifted by the wind during the prevalence of the epidemic. The same thing was observed, I hear, in different places." As we have just stated, no

mention is made of such a phenomenon having been noticed elsewhere, in any of the returns sent in to the Council; but the circumstance itself deserves to be recorded, especially since a similar occurrence is said to have taken place during other epidemics.

In the replies sent in from the eastern counties, it is stated that previous to the epidemic the weather was cold and wet, (according to Mr. Priest, of Burnham, cold and dry with much snow,) and the atmosphere hazy, the wind varying from north to north-east and east; and the disease appears to have made its appearance immediately after the commencement of a thaw, when the atmosphere was saturated with moisture. Mr. Hargraves, of Wotton, says that there was a sudden change from cold to warmth, there having been severe storms of snow for some time previous; and Mr. Priest remarks that the snow was succeeded by a mild and damp atmosphere, before which change the disease had not appeared.

In the south-eastern counties a similar atmospheric state is noticed as having occurred. "The epidemic came on" says the Chichester report, "immediately after the melting of the snow, and certainly at a time of year not generally the most sickly, it having disappeared by the end of February, just when, in ordinary circumstances, there is most sickness." In the Isle of Wight, however, according to the statement of Mr. Bloxam, the snow appears to have been constantly on the ground, and the temperature of the atmosphere varying a few degrees above or below the freezing point; but this, he observes, continued

for some time after the subsidence of the epidemic. Several of the returns from the southern counties mention a long continuance of cold winds as preceding or accompanying the disease. At Croydon, Mr. Fletcher observed a moist state of the atmosphere, with a long continuance of cold winds. At Salisbury, Dr. Grove states that easterly winds, frost, and snow, preceded the epidemic; and Mr. Sampson that these winds continued throughout. Mr. Smart, of Cranbourne, observes that the outbreak of the epidemic was preceded by a sudden thaw, and its progress attended by easterly winds. At Bew Regis the disease was observed to follow after the occurrence of easterly winds, and the breaking up of the frost; and Dr. Clendinning says that he observed no peculiar atmospherical phenomena in the neighbourhood of the metropolis, with the exception of an unusual prevalence of winds from the north, east, and north-east. One gentleman, Mr. Fox, of Cerne, states that the principal atmospheric phenomenon observed to precede the late epidemic in his neighbourhood, was a difference of twenty-six degrees in the temperature in a very few hours, but does not mention whether this difference proceeded from a change from a low to a higher temperature, or the reverse.

The tabular reports of Dr. Shapter, referring to this part of the kingdom, and those of Dr. Black from the northern districts, will be found at length in the appendix, and together with the observations of Mr. Addison made at Malvern, in the midland district, afford valuable materials for comparison.

OBSERVATIONS ON THE METEOROLOGICAL PHENOMENA.

The identity of the Influenza so universally prevalent throughout all parts of Europe in the early months of 1837, with those epidemic catarrhs which, at various periods, have visited this and other parts of the globe, cannot be disputed, and it is highly important to determine, if we can, what are the exciting causes of this widely-extended malady. In endeavouring to bring this important question to as an unexceptionable a test as an enquiry so difficult will admit of, it is requisite that doubtful or uncertain points should be discarded, and those facts only which are established by general testimony and experience, be made use of for the purpose.

From all the documents we have seen relating to this subject, it is evident that catarrh, bronchitis, and other inflammatory disorders of the chest, were more than usually prevalent in many parts of England in the period just preceding the outbreak of influenza, and that this epidemic raged not only throughout the whole of England, but in most other parts of Europe, between the first week of January and the third week of February, forcing itself upon the attention of medical practitioners, in some places a little earlier, in others rather later ; whilst again, influenced perhaps in some degree by local circumstances, it lingered among the population, in certain situations, for a more extended period than usual.

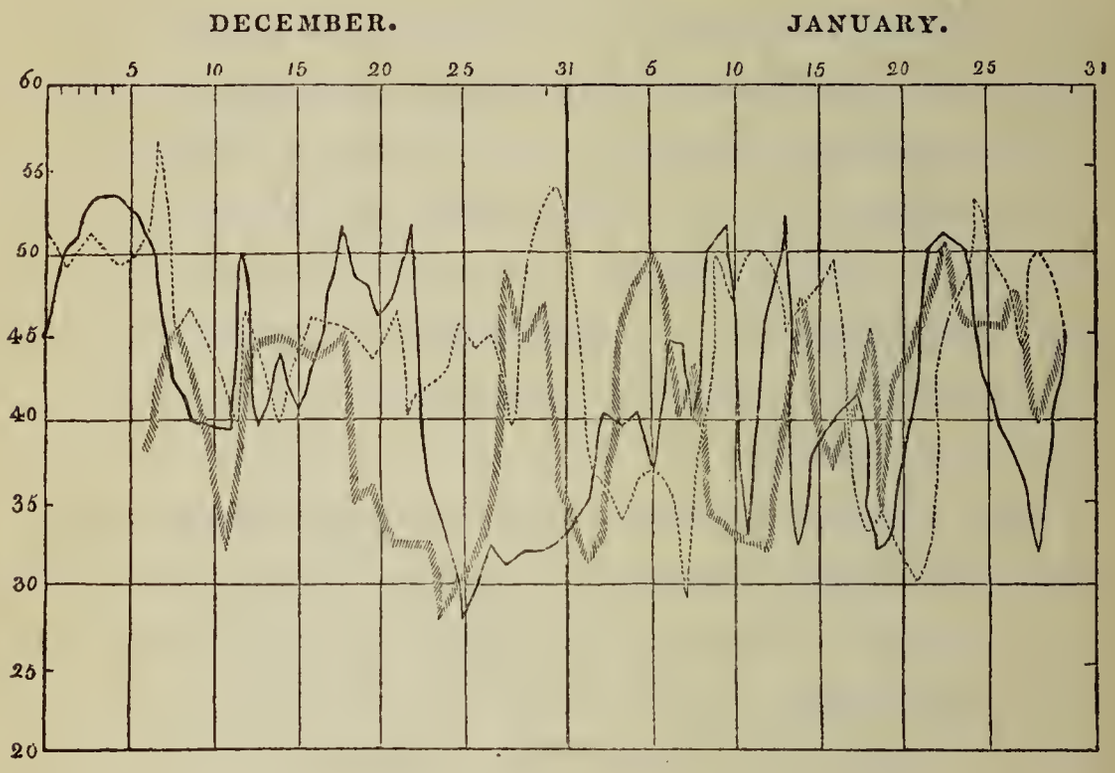
It is quite uncertain what time elapses between the application of the exciting cause and the appearance of the disease; but supposing, in the first place, that it had its origin solely in the changes of temperature, of pressure, or of weight of the aqueous vapour of the atmosphere, such an origin ought to be detected by examining these phenomena for two consecutive months, the one being the month previous to, and the other the month including, the most active period of the disease, and comparing them with the same phenomena in the same months in preceding years.

With regard to the actual weight or pressure of the air, this could only have been increased by the introduction of some foreign gaseous, or other extremely attenuated form of matter into the mass of our atmosphere. The quantity and weight of vapour is so closely connected, particularly during the winter season, to which our observations are restricted, with the temperature of the air, that a separate examination of this subject is uncalled for.

It remains, then, to investigate the changes of temperature which took place in December, 1836, and in January, 1837, comparing them with the changes observed in the December and January of the two preceding years, in order to discover whether any peculiarities characterise this period.

In the annexed wood cut, the dark line shews the variation of maximum temperature in December, 1836, and January, 1837; it may be called the influenza line: the lighter shaded line shews the

temperature for December, 1835, and January, 1836, and the dotted line for December, 1834, and January, 1835 :—



Upon attentively examining the dark line, there is nothing calling for remark until we arrive at a great depression of temperature between the 22nd and 25th of December—a fall of 25° F. in three days. This depression was caused or accompanied by a change of wind from west or north-north-west to north-north-east. On the 25th the wind blew a gale from the latter point, and during the three subsequent days a very unusual quantity of snow fell, unequalled in this country for duration, severity, and extent. A rapid thaw commenced on the second day of January, the influenza appeared in London at the same time, and it was general throughout the country on the 7th, or at farthest on the 10th.

The accounts from all parts of the country of the disastrous gales, the drifting of the snow, the floods caused by the thaw, and the outbreak of influenza, rapidly succeeded each other.

If we now examine the shaded line, which shews the variations of maximum temperature for December, 1835, and January, 1836, we shall find a great depression of temperature between the 18th and the 24th December, after which the thermometer rose quickly 20° F., and then fell again the last day of the month and during the first three days of January. The temperature then again rose 18° F. in two days, reaching 50° on the 5th. Snow fell on the evening of the 19th and during the 20th of December, lying nearly two inches deep on the morning of the 21st. The weather was frosty on the 21st and 22nd with a north-east wind, then frosty and foggy until the 27th, when a thaw took place, which continued with occasional rain and snow to the 4th of January, and on the 8th I read the following remark, penned at the time in my journal :—A particularly sickly time, catarrhs, and other inflammatory affections of the chest and larynx, accompanied in many instances with neuralgic pains.

We will now shortly refer to the dotted line. Here we see a great change of temperature. amounting to 27° F. occurring between the last day of December, 1834, and the 7th of January, 1835. On the former day the thermometer stood at 55°, with rain and a south-west wind ; frost began on the 2nd of January, and it continued with fine weather and light north-east wind until the 8th,

when the temperature rose rapidly, and rain again fell. There was no snow during these changes. There is another considerable fall of the thermometer shewn between the 15th and 20th of January, and on this occasion it both rained and snowed. Scarlet fever prevailed at this time; but catarrhal diseases were not particularly remarked.

From this examination—indeed, from the most casual survey of the foregoing lines—we may conclude that very great variations of temperature may and do occur in a short time without producing any influenza, perhaps no unusual increase in the ordinary affections of the chest, to which all persons are more or less liable during spring and autumn, except when these sudden alterations are accompanied by melting snow, which does under certain circumstances appear sensibly to increase the prevalence of inflammatory affections of the air passages.

This condition, melting snow, was operating at the breaking out of influenza in January, 1837; but did it produce the disease, or did it only co-operate in giving greater effect to other causes? That it did not produce the disease is evident, because this occurred in situations on the continent nearly about the same time, where there was no melting snow, and because the same disease has occurred before in this and other countries, in the summer months. In 1833 it was very general in this country in April and May, and again in June, 1831, partially. Dr. Bardsley, speaking of the influenza of 1802, says:—The present epidemic cannot have originated from any remarkable severity of

weather or sudden changes in the temperature of the atmosphere; no season has been apparently less unfriendly to the human constitution than the whole of the late winter and early part of spring. The epidemic catarrhs of 1762 and 1782 prevailed during uncommonly warm and steady weather, in the months of May and June. The remarkable epidemic catarrh of 1580, which, according to Sennertus, "*Totam fere Europam, imo fere omnes mundi regiones pervagata est,*"* raged chiefly during the sultry weather of autumn. In the month of September, 1830, influenza prevailed at Manilla, with the thermometer varying from 78° to 92°.†

Without uselessly multiplying instances or authorities, it must be evident that the exciting cause of influenza cannot be found in sudden vicissitudes of temperature, great heat or cold, damp weather or melting snow, however much all or any of these circumstances may predispose to or originate the more ordinary catarrhs, eruptive fevers, and other disorders of spring, autumn, and winter.

* *Medical and Physical Journal,* vol. ix., p. 527.

† *Medical Gazette,* vol. viii., p. 525.

APPENDIX, A.

A Meteorological Register for January, February, and March, 1837, with a Nosometrical View of the Epidemic Influenza during the same months, as observed at Bolton-le-Moors.

JANUARY.

1837. January.	Mean of morning, noon, and night.		At noon, Dew-point.	Evaporation.	Fall of rain.	Weather.	Nosometrical intensity of the epidemic Influenza. Maxm. 100.
	Therm.	Barom.					
1	30°.3	30.27	30°	...	...	Fair all day	
2	32.3	30.12	31	...	...	Very foggy	1
3	40	30.02	38	...	...	A little rain A.M. and P.M.	
4	38.3	30.02	39	...	...	Fair.....	
5	36	29.62	35	...	...	Fair.....	
6	39.3	29.19	38	...	...	Rain all day, some hail P.M.	.5
7	38.3	29.37	38	...	...	Rain and a little hail A.M. and P.M.	
8	38.7	29.82	35	...	...	Rain at night.....	
9	47.3	29.68	46	...	...	A little rain A.M.	1
10	37.3	29.62	38	...	...	Fair..... ..	
11	27.7	29.89	27	...	...	Fair..... ...	1.5
12	34.3	29.47	28	...	...	Snow A.M., snow and rain P.M. ...	
13	40.7	29.17	38	in	in	Rain in the morn.	2
14	33.7	29.94	32	16	16	Fair.....	2.3
15	34	30.15	30	days	days	Fair.....	3.4
16	38.7	30.05	37	0.15 in.	2.44 in.	Very foggy P.M...	4.6
17	40	29.98	38	...	...	Fair.....	9.1
18	38	29.82	35	...	...	Fair.....	14
19	37.7	29.64	35	...	...	Fair.....	18
20	35	29.46	32	...	...	Fair.....	25
21	37	29.25	33	...	...	Rain at night.....	30
22	44	28.94	43	...	...	Rain all day	40
23	45.3	29.02	43	...	...	Rain all day	42
24	41.7	29.30	41	...	...	Rain A.M.	50
25	41	29.45	40	...	...	Rain all day	56
26	39.3	29.53	37	...	...	Fair.....	71
27	37	29.68	36	...	...	Rainy at night ...	75
28	33	29.73	33	... in	... in	Snow at night and a little A.M. and P.M.	80
29	32	29.57	30	15	15	Snow all day	90
30	36	29.48	34	days	days	Snow A.M.	92
31	41.7	29.61	40	0.09 in.	1.10 in.	Rain P.M.	93
Max.	49°	30.31		Total.	Total.		
Min.	25°	28.88		0.24 in.	3.54 in.		
Mean	37°5	29.638	35°				

FEBRUARY.

February.	Mean of morning, noon, and night.		At noon, Dew-point.	Evaporation.	Fall of rain.	Weather.	Nosometrical intensity of the epidemic Influenza. Maxm. 100.
	Therm.	Barom.					
1	41.3°	29.79	40°	...	...	Rain at night ...	95
2	43.3	29.99	41	...	...	Fair all day	98
3	41.3	30.03	40	...	...	Rain all day	100
4	41	30.07	40	...	...	Fair all day	90
5	37.7	30.01	36	...	...	Rainy A.M. and P.M.	82
6	41	29.98	37	...	...	Fair all day	71
7	41	29.88	39	...	...	Fair all day	60
8	43	29.80	41	...	...	Rain A.M. and P.M.	72
9	47	29.83	44	...	...	Some rain at night	91
10	49	29.34	50	...	...	Rain all day, and stormy P.M.	69
11	43.3	28.72	50	in	in	Rain and very stormy all day...	62
12	39.3	29.02	37	14	14	Rain morn. and nt.	60
13	44	28.82	44	days	days	Rain A.M.	55
14	41	29.21	40	0.27 in	2.15 in	Fair all day	50
15	43.3	29.62	41	...	...	Rainy P.M.	44
16	52	29.65	50	...	...	Fair all day, stormy at night	37
17	44.3	29.90	44	...	...	Fair all day	36
18	41.3	29.44	44	...	...	Rain P.M. rain and hail at night.....	30
19	38.3	28.95	38	...	...	Rain and a little snow all day, boisterous P.M.	23
20	42	29.19	42	...	...	Rain at night.....	21
21	41.3	29.19	41	...	...	Rain at night and P.M.	14
22	41	29.51	39	...	...	Rain A.M. rain and snow P.M.	9.1
23	39	29.02	43	...	...	Rain hail and snow very stormy P.M. and night	8
24	39	29.64	40	...	...	Fair all day but boisterous.....	7
25	35.3	29.95	35	in	in	Fair all day	6
26	33.7	29.90	30	14	14	A little snow P.M.	7
27	39.3	29.74	40	days	days	Rain at night	4.6
28	38	29.95	40	0.54 in.	2.25 in.	A little rain P.M.	4
Max.	56°	30.10		Total.	Total.		
Min.	30°	28.60		0.81 in.	4.40 in.		
Mean	41°4	29.57	40°9				

MARCH.

March.	Mean of morning, noon, and night.		At noon, Dew-point.	Evaporation.	Fall of rain.	Weather.	Nosometrical intensity of the epidemic Influenza. Maxm. 100.
	Therm.	Baro.					
1	34°	30.19	32°	...	...	Fair all day	3.4
2	37.7	30.10	32	...	...	A little rain P.M. and at night.....	3.5
3	40	30.08	41	...	...	Slight rn. A.M. & P.M.	4.6
4	39	29.95	39	...	...	Fair all day	4
5	37.3	29.71	39	...	...	Slight rn. A.M. & P.M.	3.5
6	39.3	29.77	37	...	...	Fair all day	3
7	40	29.85	37	..	...	Fair all day	2.3
8	42	29.83	38	...	...	Fair all day, but strong wind P.M. and night.....	2.2
9	45	29.57	39	...	...	Slight rain P.M. and at night.....	2
10	41.7	29.00	40	...	...	Rain P.M. & stormy	1.2
11	36	28.95	34	...	...	Snow and rain P.M.	
12	36.3	29.23	35	in	in	Rain & snow at nt.	
13	36.3	29.85	38	15	15	Snow A.M.	1
14	37	30.17	32	days	days	Fair all day	
15	37	29.99	33	0.38 in.	0.20 in.	Fair all day	1.2
16	40.3	29.92	36	...	...	Fair all day	
17	41.7	30.08	38	...	...	Fair all day	
18	37.7	30.02	37	...	...	Slight sleet at nt.	
19	37.3	29 85	33	...	...	A little snow A.M.	
20	35	29.78	38	...	...	Snow all day	1.3
21	37.3	29.55	32	...	...	Slight snow the whole 24 hours...	
22	32.7	29.50	32	...	...	Slight snow P.M. and at night.....	1
23	32.7	29.47	34	...	...	Slight snow the whole 24 hours...	
24	34	29.54	35	...	...	Much snow in the morning	
25	36	29.46	35	...	...	Slight rain and snow at night...	.8
26	34	29.52	34	...	...	Slight sn. & hail P.M.	.5
27	32.3	29.66	30	...	...	Slight snow all day	
28	36	29.47	34	...	...	Heavy fall of snow A.M. snow P.M. ...	
29	37.7	29.36	36	in	in	Snow A.M. hail at nt.	.1
30	36.7	29.57	36	16 days	16 days	Fair all day	
31	36.7	29.64	34	0.25 in.	1.21 in	A little snow early in the morning...	
Max.	51°	30.20		Total.	Total.		
Min.	26°	28.90		0.63 in.	1.41 in.		
Mean	37°3	29.697	35°5				

APPENDIX, B.

Register of 420 *burials at the Parish Church, Bolton, in January, February, and March,* 1837, *with the average amount of burials during the same months of the five previous years, and the ratio per cent., buried at the several ages, to the total deaths in the two periods.*

Age.	1837.			Total burials for the three months.	Ratio per cent. at the several ages to the total burials for the three months.	Average burials during the same months in the five previous years.	Ratio per cent. at the several ages to the total burials in the same months of the five former years.
	Jan.	Feb.	Mar.				
Under 1 year	21	50	21	92	21.9	76.6	26. 6
1	11	24	7	42	10.	39.8	13. 8
2	10	8	2	20	4.8	18.2	6. 3
3	1	8	2	11	2.6	8.6	3.
4	3	1	3	7	1.7	9.4	3.24
5 — 9	3	3	4	10	2.4	18.	6.27
10 — 14	5	8	4	17	4.	7.	2.43
15 — 19	4	4	1	9	2.1	6.8	2.36
20 — 24	2	5	6	13	3.	10.2	3.54
25 — 29	2	6	2	10	2.4	9.4	3.26
30 — 34	7	10	1	18	4.3	6.8	2.36
35 — 39	1	5	5	11	2.6	7.	2.43
40 — 44	6	7	3	16	4.	6.8	2.36
45 — 49	8	11	7	26	6.2	7.8	2. 7
50 — 54	7	9	3	19	4.5	6.	2.
55 — 59	1	9	3	13	3.	7.8	2. 7
60 — 64	2	11	6	19	4.5	11.4	4.
65 — 69	10	11	6	27	6.4	8.6	3.
70 — 74	2	8	9	19	4.5	11.4	4.
75 — 79	5	3	2	10	2.4	4.8	1.66
80 — 84	3	4	2	9	2.	4.	1. 4
85 — 89	...	...	...	...	...	2.4	.83
90 — 94	...	...	...	...	...	.6	. 2
95	1	...	...	1	.24	.2	.07
100	...	...	1	1	.24	...	...
Total.....	115	205	100	420			
Total average for the five previous yrs.	111.2	79	97.8			288	

APPENDIX, C.

Table 1.—*Mean state of the thermometer, barometer, dew-point, wind, and amount of rain at Exeter, for September, October, November, and December,* 1836, *and January, February, March, and April,* 1837, *together with the proper means for these same months.*

		1836.				1837.			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April.
Thermometer.	1836 and 1837	54.8	51.	44.	42.	36.	40.6	36.3	40.3
	The mean ...	56.9	55.2	45.5	43.4	39.	41.7	44.4	48.7
Barometer.	1836 and 1837	29.77	29.63	29.50	29 68	29.79	29.79	29.79	29.66
	The mean ...	29.87	29.94	29.86	29.79	29.85	29.91	29.98	29.83
Dew-point.	1836 and 1837	48.3	45.3	38.6	33.6	34.3	40.3	30.3	35.
	The mean ...	51.	45.3	41.1	40.4	36.3	38.4	39.3	41.5
Wind.	1836 and 1837	S.W.	S.	W.	N.	NW	W.	W.	W.
	The mean ...	W.	W.	W.	W.	N.E.	W.	W.	W.
Rain in inches.	1836 and 1837	2.9	4.1	5 6	2.5	1.8	3.3	1.0	1.6
	The mean ...	3.	3.1	3.1	3.6	2.9	2.6	2.1	2.5

Table 2.—Being the mean state of the thermometer, barometer, dew-point, wind, and amount of rain, for each period of ten days, from September, 1836, to April, 1887, inclusive.

	Thermometer.			Barometer.			Dew-point.			Wind.	Rain.
1836.	Max.	Min.	Med.	Max.	Min.	Med.	Max.	Min.	Med.		
September.											
1 — 10	70	44	54	29.75	29.21	29.65	52	47	49	S.&S.W.	2.30
10 — 20	63	43	53	30.00	29.85	29.91	50	44	47	N. E.	—
20 — 30	69	43	57	30.03	29.23	29.77	56	44	49	S. W.	.60
October.											
1 — 10	57	32	47	29.75	28.80	29.21	49	39	42	S. W.	2.12
10 — 20	61	40	50	30.26	28 72	29.68	54	44	48	S. E.	1.68
20 — 31	57	24	57	30.25	29.16	30.00	50	28	46	N.	.30
November.											
1 — 10	55	30	42	29.90	29.27	29.66	48	34	39	W.	1.20
10 — 20	55	33	45	29.90	28.96	29.48	48	34	39	S. W.	1.42
20 — 30	55	28	46	29.80	29.02	29.36	44	32	38	S. W.	3.02
December.											
1 — 10	55	36	48	30.03	28.88	29.56	46	36	42	W.	1.32
10 — 20	52	34	43	30.10	29.07	29.67	44	36	39	N. W.	1.04
20 — 31	50	28	35	30.25	29.46	29.81	42	20	30	N. E.	.14
1837.											
January.											
1 — 10	48	26	37	30.36	29.51	30.03	40	28	34	N. W.	.10
10 — 20	51	27	31	30.25	29.53	29.89	42	29	32	N.	.30
20 — 31	53	29	40	29.73	29.20	29.45	42	30	37	S. W.	1.44
February.											
1 — 10	50	34	42	30.10	29.53	29.97	48	38	45	S. E.	.60
10 — 20	55	33	40	30.10	29.03	29.63	48	38	41	S. W.	2.14
20 — 28	49	32	40	30.10	29.50	29.98	42	32	35	W.	.60
March.											
1 — 10	48	28	38	30.28	29.20	29.92	38	27	31	N.&W.	—
10 — 20	49	29	37	30.10	29.10	29.83	36	26	31	E.	.40
20 — 31	46	20	35	29.90	29.53	29.64	31	25	29	N. W.	1.00
April.											
1 — 10	48	27	37	30.20	29.46	29.81	38	24	32	N.	.16
10 — 20	56	29	38	29.83	29.33	29.65	40	27	31	N. W.	.14
20 — 30	59	36	46	29.70	29.22	29.52	49	40	42	W.	1.30

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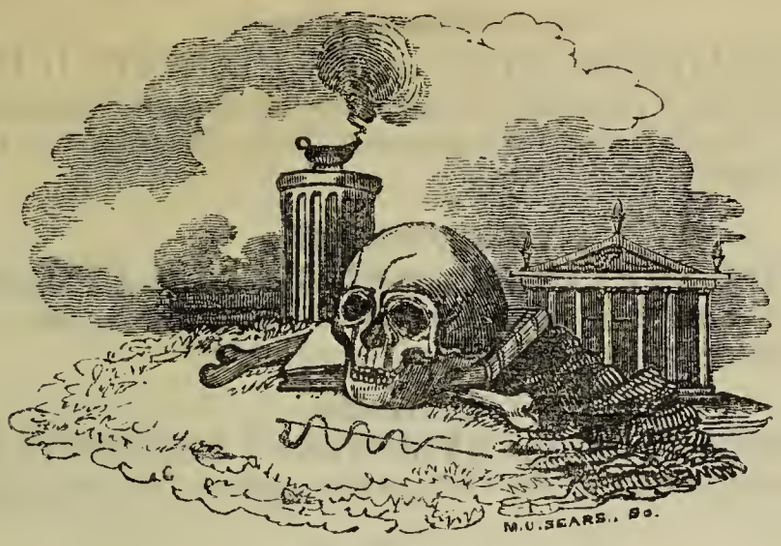

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