

Remarks on the present state of practical chemistry and pharmacy, with suggestions as to the importance of an extended practical course / [D.B. Reid].

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REMARKS

ON THE PRESENT STATE OF

PRACTICAL CHEMISTRY AND PHARMACY,

WITH

SUGGESTIONS AS TO THE IMPORTANCE OF AN EXTENDED
PRACTICAL COURSE.

By D. B. REID, M. D.

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VICE-PRESIDENT OF THE SOCIETY OF ARTS FOR SCOTLAND, AND LECTURER ON

CHEMISTRY TO THE EDINBURGH SCHOOL OF ARTS, FORMERLY

SENIOR PRESIDENT OF THE ROYAL MEDICAL SOCIETY.

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1838.

REMARKS

ON THE TREATMENT OF

THE DISEASE

BY T. J. CHAMBERLAIN, M.D.

SUGGESTIONS TO THE IMPROVEMENT OF AN EXTENDED

EDITION OF THE

M.D.



EXTRACT FROM DR D. B. REID'S MEMORIAL ON THE STATE OF
PRACTICAL CHEMISTRY IN EDINBURGH IN 1833.

“ THE importance of this branch of chemical education is now universally admitted. It is necessary for all who study Chemistry for any scientific or practical purpose. Its connexion with our arts and manufactures is becoming daily more intimate.

“ It is indeed obvious, that not only the wide and daily extending practice, but the future improvement of Chemistry, must, in a great measure, depend upon the exertions of those who are practically conversant with its operations. Hence a proper school of Practical Chemistry may be considered as multiplying the resources of the science, and the means of improvement, just in proportion to the number who are trained in it.

“ Since the connexion which subsists between Chemistry and the Arts and Sciences has been better understood, lectures alone have not been found sufficient to communicate that information which it is considered the student of Chemistry ought to acquire. The agriculturist, the manufacturer, the medical student, and every one who wishes to cultivate any branch of Natural Philosophy as a man of science, finds it necessary to make Practical Chemistry an object of his attention. No science is more eminently practical than Chemistry. It rests altogether upon experiments. What has enabled Chemistry to attain such a high rank among the Sciences, and to lead in her train so many dependent arts?—Nothing but well conducted experiments. To what is she to owe her future progress?—To experiment alone. What makes her at this moment the proudest triumph of the Inductive Philosophy, one

of the greatest monuments of the school of Bacon? Her discarding all false analogies, loose abstractions, and preconceived opinions; her strict adherence to Experiments, and her inductive methods. Hence the strict interpretation that she thus elicits of the great laws of nature, and the new powers which she is every day developing for the use of man. Why the teaching of the practice of this Science has hitherto been so little attended to, though so great an object of national importance, can only be accounted for from the progress of the Science itself, which has of late been so rapid and extraordinary, as scarcely to allow time to estimate the nature of her newly acquired capabilities, to adjust her methods of teaching to her daily extending relations, and the increasing variety and power of her instruments.

“ While the necessity of a course of Practical Chemistry to professional men, and all those who mean to apply it to practical purposes, is now admitted on all hands, its importance as a branch of general education has been strangely overlooked. All who take any interest in education, and consider that one of its leading objects is to cultivate a general activity of mind, a power of fixing the attention, and a talent for observation with habits of action, will acknowledge that the establishment of a class which embraces all these objects, is a great desideratum.

“ That Practical Chemistry, when properly taught, supplies this desideratum, and is of the utmost value as a process of mental training, may be easily shewn. The student engaged in conducting chemical processes, from the striking nature of the phenomena they exhibit, and the interest he necessarily feels in the result, has his attention and powers of observation perpetually on the alert. He is forced to bring his knowledge to bear on the subject in a way that makes the impression almost indelible. Indeed, knowledge thus acquired from personal observation, and connected with habits of action, takes root; it has all the accuracy and precision of actual experience, and is admirably calculated to awaken and strengthen the best faculties of the mind.

TO
THE PRESIDENTS AND FELLOWS OF THE ROYAL
COLLEGES OF PHYSICIANS AND SURGEONS.

GENTLEMEN,

In taking the liberty of addressing the following remarks more especially to your notice, I have indulged the hope that the great interest you have taken in the subject of Education, will lead you to excuse the imperfect outline I have given of the alterations I have ventured to propose in the Practical Course of Chemistry and Pharmacy, as I could not have entered into more minute details without extending my remarks beyond the limits usually assigned to a pamphlet on this subject. My great object has been to examine in all its details the working of the Practical Class, to propose a system of instruction that may obviate the defects under which it labours at present, and to recommend nothing in reference to it of the importance and practicability of which I had not previously been assured by actual experience. During the last five years my attention has been directed principally to this object, and I shall be happy to afford any farther explanation that may be required.

I have the honour to be,

GENTLEMEN,

Most respectfully,

Your most obedient Servant,

D. B. REID.

EDINBURGH, April 7. 1838.

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REMARKS, &c.

THE rapid progress of the Arts and Sciences of late years, and the great attention now paid to the principles of Education, have affected so much the whole frame of society, that it is impossible to turn in any direction without observing their influence, both on the various relations of individual life, and in all those great institutions which are so warmly cherished in every civilized community. New sources of information have been developed—new powers of action have been brought into play—a more friendly intercourse has taken place throughout a greater portion of the globe than ever existed in any former period of history; and, while the individualities of one's own country must ever be the warmest objects of attachment, still every day brings more and more convincing proof of the benefits which all nations derive from a friendly intercourse with others. In no country, perhaps, are the effects that spring from these sources more deeply traced than in our own. None has commercial relations so widely established over the whole globe—none sends forth a greater number of individuals into distant regions in the military or naval service, or as missionaries, engineers, manufacturers, or qualified in other capacities to undertake some arduous office in a foreign land. Even her mechanics and artizans may be seen, in every quarter of the globe, disseminating a practical knowledge of the arts they may have cultivated at home, or superintending that great monument of modern times, the steam-engine, in all its mighty operations for abridging human la-

bour, and for facilitating communication between man and man.

It would be surprising then, if, in their reflex operation, the institutions of this country were not affected by the causes we have so briefly adverted to, and still more especially, those establishments in which the higher branches of education are taught, where men are trained for all the more responsible situations in society. Here, however, the genius and disposition of its laws, the temperament and feeling of its inhabitants, and the force and influence of its customs, have not led to that direct connection between its educational establishments and the Government, which exists in many other places. The people, in a more especial manner than the Government, have been called upon, in the first instance, to move forward in matters of science and education. These are not under the immediate protection and control of any Minister of Instruction; and accordingly, it is their duty to examine minutely into the causes of any defect that may be connected with such public institutions, or to point out any extension that may be required to enable them to keep pace with the progress of the age.

In the few observations contained in this pamphlet, it is not proposed to inquire how expedient it would be, were the Crown to appoint Ministers, or a Board, whose sole attention should be devoted to the interests of Science and Education—a system which has been so warmly advocated of late by many eminent men, and, more especially, from the effects which it is producing in other nations, where we may be enabled to judge of its operation by its fruits,—but simply to request attention earnestly to some points connected with the state of education in a particular branch of science, which has been the subject of much discussion of late years; and which, there is reason to believe, may easily be put in a position much more advantageous to the student and the public than it has hitherto occupied, while, at the same time, the teacher may be relieved from a restriction which is most injurious to all his efforts, which bears heavily upon his time and resources, and to which there is no parallel in any other branch of practical science taught at present either within or without the walls of

the University. It is, indeed, to this restriction that much of the comparative inefficiency may be attributed that is at present inseparably associated with the Practice of Chemistry; and though it is acknowledged that it was introduced with the very best views, and has been considered necessary by gentlemen whose opinions and motives are equally respected, still, in this particular, as there is unfortunately a difference of opinion, it is trusted that any inquiry into the merits of the case may be made which the facts adduced may appear to demand. And in a science, such as Chemistry, so intimately connected with so many objects of investigation in the medical profession, that no branch of it can be studied without a constant reference, directly or indirectly, to the facts and doctrines which it embraces,—a science, also, which is one of the first that engages the attention of the medical student,—too much attention cannot be paid to the system of education adopted: for it is then that the student forms those habits of activity and steadiness, or of supineness and inattention, which usually accompany his future career; laying a good foundation, which supports him in all his subsequent studies, or passing over in a careless manner those principles, a want of the knowledge of which clogs and embarrasses his progress in every succeeding science upon which he enters. Dr D. B. Reid may be permitted to add, that he has not ventured to bring forward the propositions he has taken the liberty of submitting, without a very careful and elaborate inquiry, which has now been continued for many years. It may, indeed, be necessary for him on this occasion to state, that, before he entered upon the study of medicine, he had been engaged as assistant and superintendant of the chemical manufactories of the late Joseph Astley, Esq., with whom he received his first instructions in Chemistry; and in examining the state of Practical Chemistry, while a student of medicine, it occurred to him that much might be done to put it upon a more extended footing; and he accordingly commenced, with this view, as a teacher of Practical Chemistry, in his first class-room, in the High School Yards. Some years afterwards (about five years ago), considerable attention was directed to the state of Practical Che-

mistry as a branch of education, and its daily increasing importance to the members of the Medical profession, as well as to other classes of society. The views he then proposed were not agreed to, and, accordingly, since that period, Dr Reid has endeavoured to ascertain in what other mode arrangements might be made to put the practice of Chemistry and Pharmacy upon that efficient footing which the present state of medical science so imperiously demands. In prosecuting these objects, he has explained his views to different individuals in town, and particularly to some members of both Colleges, who have been in the habit of visiting his class-room. Before bringing them into public notice, however, he resolved to make an inquiry as to the state of education in this department on the Continent, during which he was fortunate enough to meet with Baron Berzelius, and his successor Professor Mozander, Baron Humboldt, and Professor Mitscherlich of Berlin, Sir James Wylie, who was kind enough to shew him all the arrangements connected with the Medical Department at St Petersburg, and MM. Gay Lussac, Becquerel, Pelouze, D'Arceet, Chevreul, Brongniart, and many other scientific gentlemen, who were so obliging as to assist him in all his inquiries. Nor ought he to forget M. Robiquet, who conducted him through all the departments of the College of Pharmacy at Paris, where the Museum, the arrangements for Practical Pharmacy, &c., gave the most convincing evidence of some of the causes that had contributed so much to distinguish the Apothecaries of that city. But it is unnecessary for him to enter into farther particulars on this point. He will only add, that the general disposition of the museums, laboratories, and hospital arrangements, and the mode of proceeding in the Schools of Mines, the Colleges of Pharmacy, and the Laboratory of the Polytechnic School, and in other institutions both in Paris and elsewhere, where Practical Chemistry and Pharmacy were introduced, were special objects of inquiry. The result of these having confirmed him in his views, he has now more confidence in bringing them before the attention of the public, and is assured that no one will consider him as reflecting upon the present order and arrangement adopted in

any school of medicine, but, on the contrary, only advocating such improvements as are equally called for by the state of science and the progress of society.

A three months' course, during which the student attends an hour a-day, is the usual period allotted to the Practical Course. If the student were to confine his attention solely to manipulation in this course, taking one illustration of each operation that presented any peculiarities, he might, indeed, be able to go over considerable ground in a three months' course, but he would have no time to study the science practically in a systematic manner. A kind of mechanical expertness in experimenting would be the only fruit of such a course. But this never has been the nature of the Practical Course; the students attend it as the most efficient mode of becoming acquainted with Chemistry; they would be much disappointed if any experiment of importance were omitted, nor are there above one or two out of fifty who can proceed with any satisfaction in the experiments they perform, without having a frequent explanation of the theory brought before them, at the moment they are engaged in experimenting.

Such being the case with respect to the nature of the practical course, it must be considered how far the time allotted to it is sufficient to enable a student of average abilities to become practically acquainted with those departments of the science which he may be expected to know. It is presumed that, in the following list, no one will be inclined to think that any subject is inserted which a student of Practical Chemistry and Pharmacy could, with any justice to his studies, pass over. On the contrary, it is affirmed, that it presents the barest outline which it is possible to submit as a part of professional education.*

* No course is referred to here but the ordinary practical course. Different courses, as courses arranged for advanced students, or in reference to particular branches of Chemistry, have always been given by Dr Reid.

Table shewing the principal subjects requiring the attention of the student in the Elementary Course of Practical Chemistry and Pharmacy.

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|--|---|
| 1. Use of the balance in chemical operations. | 36. Potassium and its preparations. |
| 2. Specific gravity of chemicals. | 37. Soda, &c. |
| 3. Production of Heat. Furnace operations. | 38. Ammonia. |
| 4. Management of coke, coal and charcoal. | 39. Lime, &c. |
| 5. Gas and other kinds of fuel. | 40. Baryta, Strontia, Magnesia, &c. |
| 6. Production of cold. Freezing mixtures. | 41. Alumina. Silica. |
| 7. Examination of air, ventilation. | 42. Iron. |
| 8. Use of the Blowpipe. | 43. Lead. |
| 9. Tube apparatus. | 44. Copper. |
| 10. Flat-glass apparatus. | 45. Zinc. |
| 11. Water. | 46. Antimony. |
| 12. Steam. | 47. Chrome, manganese, cobalt, and nickel. |
| 13. Mineral waters. | 48. Arsenic. |
| 14. Acidimetry. | 49. Mercury. |
| 15. Alkalimetry. | 50. Silver. Gold. |
| 16. Crystallization. | 51. Platinum. Use of instruments of platinum. |
| 17. Electrical machine. | 52. Oxalic and Tartaric acid. |
| 18. Galvanic trough. | 53. Acetic acid. |
| 19. Electro-magnetic machine. | 54. Citric, Benzoic, Gallic, and meconic acids, &c. |
| 20. Experiments in vacuo and with the air-pump. | 55. Prussic acid. |
| 21. Experiments under increased pressure. | 56. Morphia. |
| 22. Filtration. Funnels. Displacement. Pressure. | 57. Quina. |
| 23. Crucible operations. | 58. Strychnia. |
| 24. Pneumatic apparatus. | 59. Fixed oils. |
| 25. Glass apparatus. | 60. Volatile oils. |
| 26. Porcelain apparatus. | 61. Sugar, starch, gum, gluten. Examination of flour and bread. |
| 27. Miscellaneous apparatus. | 62. Colouring matter. |
| 28. Oxygen and hydrogen. | 63. Fermented liquids. |
| 29. Nitric acid. | 64. Ethers. |
| 30. Sulphuric acid. Sulphur. | 65. Fibrine, albumen, gelatine. |
| 31. Sulphureted hydrogen. | 66. Bone, animal charcoal. |
| 32. Compounds of phosphorus. | 67. Examination of blood. |
| 33. Carbon. Carbonic acid. | 68. Milk. |
| 34. Chlorine. | 69. Bile and biliary calculi. |
| 35. Iodine (bromine. Fluorine). | 70. Animal oils and fats. |
| | 71. Urinary calculi, &c. |
| | 72. Miscellaneous operations. |

But a three months' course, in general, includes, at the utmost, about seventy-two working days, and deducting twelve of these for lessons in analysis and practical exercises, so essentially necessary in a course of Practical Chemistry, it is, indeed, impossible to include the foregoing subjects without extra lessons, which it is often very difficult to arrange from the different engagements of the pupils.

It need scarcely be stated, that, to go over some of these

subjects in a proper and deliberate manner, several successive practical lessons, each continuing at least for two or three hours, would be necessary, as in studying the compounds of chlorine, and the preparations of potassa, antimony, mercury, &c. and the DETECTION OF ARSENIC. In operating with the BLOWPIPE alone, the student cannot acquire any thing approaching to a proper command and knowledge of this invaluable instrument in less than ten lessons. Extra opportunities are accordingly given to enable him to become familiar with it.

Farther, let it be recollected, that the Practical Chemistry and Pharmacy class, is the only class in which the student has the opportunity of acquiring a practical knowledge of the method of experimenting, the only place where he is expected to become practically familiar with those processes and reagents he must have recourse to in future life, where he may be called upon to detect a poison—to tell the nature of a mineral water—to analyse a calculus—to look for adulterations—to measure accurately the strength and energy of his medicines, the tools with which he works—to prepare them for himself when thrown at a distance upon his own resources—to examine the state of the atmosphere in any hospital—or, in short, to conduct any of those numerous chemical investigations, which a medical man, who has had the opportunity of attending such a class, may be expected to know how to bring to a successful termination.

But the Practical Chemistry class labours under another disadvantage, which it is equally important to remove, though this is far from being peculiar to it. Being only a three months' course, the Student who attends it very frequently does not make sufficient allowance for the time that is absolutely necessary to do it justice. It is too often considered as a subordinate branch, which he may hurry over at any time that may best suit his convenience; and hence it is not at all uncommon, to see him enter for this class while he is engaged with no less than five or six other subjects. Cases of this kind have so frequently been forced upon Dr Reid's attention, that he was led to make numerous inquiries on this point; and is satisfied that the practice exists to an extent quite incompa-

tible with a fair attention to this class. The pupils who are in the situation now adverted to, very frequently give themselves much more trouble with their Chemistry before they have done with it, and make much less progress, than others who devote much less time to this class. They are unable to give a fair attention to it; what they learn accordingly is learned hurriedly. They are thus forced to content themselves with a glimpse, instead of becoming familiar with the subject; and as this soon fades away, they are in a perpetual state of anxiety, and always vainly endeavouring to renew their knowledge; whereas, the Student who avoids the frequent error of overcrowding his classes, becomes so thoroughly acquainted with principles as well as facts, that, afterwards, he has comparatively little or no trouble with what he has once thoroughly investigated.

It will be obvious, from the preceding statements, that, whatever progress may be made by the private pupils of the teacher, the great majority who follow merely the prescribed course, cannot be so well acquainted with the Practice of Chemistry and Pharmacy as is required in the exercise of their professions. And as a considerable number attend this class principally, if not entirely, with the view of devoting themselves afterwards to the pharmaceutical department, the manner in which it supplies their wants demands the most careful consideration.

If we look to the impurities found in medicines, the adulterations to which they are subject, and the importance of a thorough knowledge of experimental Chemistry in the preparation of numerous valuable medicinal agents, the defects of the present system of teaching Practical Chemistry will be seen in a still more glaring form. Eleven or twelve years ago, in searching for Peruvian bark for the preparation of sulphate of quina, Dr Reid was offered, among a variety of other specimens, a portion at a price so far below that usually demanded, as to lead him to make the most minute inquiries on the subject, and obtained afterwards the most decisive proof that it consisted merely of the refuse of Peruvian bark, from which the quina had been previously extracted, having been mixed with a little fresh bark in powder to give it a flavour. Since

that period, the subject of adulterations, the extent to which they are carried, and the impurities generally in pharmaceutical preparations, have continually engaged his attention; and while he cannot but concur with those who consider that the pharmaceutical preparations are too frequently in such a condition, as in no small degree to frustrate the intentions of medical and surgical practice, and entail a protracted suffering in the patient, he is also prepared to affirm, that the zeal and activity of the principal apothecaries in procuring their supplies from the purest sources, has done much to put this department on a very superior footing to what it has ever previously enjoyed; and that the same cause, a desire to forward the state of Pharmacy in this country, has even led several of them to prepare a variety of articles, which they could not have attempted to have manufactured without very considerable skill; and so complete has their success been, that he may be allowed to quote the fact of Mr Duncan, the distinguished apothecary in this city, having not only introduced the manufacture of the muriate of morphia, to which the researches of Dr Gregory and Dr Robertson contributed so much, but even so great was his success that he sent it also to the London market. Nor ought he to omit mentioning, that Mr Macfarlane has entered upon the same field, and that his acetate of morphia is perhaps the most beautiful and perfect specimen of this salt which has been made either here or abroad. He is indeed assured that there is now a greater desire among the apothecaries, as a body, than ever prevailed at any former period, to provide their drugs from the purest sources, and to make their pharmaceutical arrangements in accordance with every thing that the medical profession could expect or desire. The impurities that are observed by the professional chemist arise, it is believed, in many cases from ignorance of their nature and extent: nor do they appear to exceed what may be observed in other matters, where materials ultimately disposed of by retail pass previously through many successive hands. An investigation into the nature and qualities of different kinds of pigments, metals, flour, wine, brandy, ale, many groceries, and various other matters constantly referred to the practical chemist, will prove what has now been stated. Oc-

casional adulterations may always be expected, unless the occupations of Pharmacy be exempt from what all others are subject to. Numerous facts indeed lead to the conclusion, that the investigation of this question is one of great complexity, and that adulterations are not practised so generally as the impurities detected might at first lead us to suppose. The respectability of numerous wholesale and retail establishments, and the great ignorance of pharmacy displayed in others, precludes the belief that adulterations are carried on so extensively with a fraudulent intention, as some have imagined; and, indeed, the retailer has less temptation, from the great per-centage he receives, than the larger establishments. May the great extent to which it has been observed of late not depend principally upon the increased facilities of detection now accessible to the public from the progress of science?

The evil, however, arising from the impurities in medicines, where the agents employed are so frequently of great activity in reference to the animal economy, is too serious not to require the most careful consideration; and the medical profession cannot fail to be keenly alive to its importance. It is indeed calculated to excite and alarm the fears even of the most indifferent. The case demands peculiar attention also from the circumstances under which they act, and the dangerous consequences which might ensue from an amount of adulteration too trivial to be noticed in other matters.

The great root of the evil appears to lie, not so much in any intention to impose a spurious article, however gross such attempts at times may be easily proved to have been by the most unequivocal evidence, but in the defective means at present afforded to apothecaries and others, who ought to be acquainted with Practical Chemistry, for acquiring the knowledge necessary for estimating the strength of the materials in which they deal, and for detecting the adulterations to which they are liable. On looking to the medical profession, the number at present who can conduct the analysis of any medicinal preparation, bears but a small proportion to the number engaged in actual practice; and it is known also that the number of individuals engaged in apothecaries' shops who cannot tell precisely the strength of acids and alkalis, though this is one of the most simple and indispensable of the processes

in analytical Chemistry, is very considerable, unless we confine ourselves to those who began their studies after the Practical Chemistry and Pharmacy class was established; and if impurities have of late been more frequently noticed than formerly, it is gratifying to consider that the same science which enables us to detect them, has also afforded increased power of remedying the dangerous consequences to which they might lead.

The Professor of Materia Medica in this city has publicly proposed a step which cannot fail to be highly important in reference to the progress of Pharmacy in this town,—the institution of an Association of Apothecaries. Two years ago, Dr Reid proposed this to one of the apothecaries of Edinburgh as a plan that must sooner or later come into operation, and with the view of forwarding this object, he examined particularly last summer the constitution of a similar institution abroad. But it is obvious that some time must elapse before such an association could be brought into effective action; and, after the particulars now detailed, the conclusion will be admitted, that the only effectual remedy for the evils above alluded to are,—the extension of the practical course of Chemistry and Pharmacy.

But in what manner is this to be effected? and will this not necessarily involve a great additional burden on the Student? Where also is the time to be found for it, without imposing another year's attendance upon the pupil?

The Practical Chemistry class labours at present under the oppressive restriction of being confined to twenty-five students, whatever may be the expenditure of the teacher, the labour which he bestows on his arrangements, or the facilities which he may endeavour to introduce. Why this class should labour under so severe a restriction, while the classes for

Practical Anatomy,

Practical Surgery,

Practical Medicine, and

Practical Surgery as taught at the Hospital,

Practical Mechanical Philosophy,

Practical Mathematics, and

Practical Drawing,

are all free and unrestricted in this respect, it is indeed difficult for him to see. There is scarcely a single argument that applies to Practical Chemistry, that does not equally apply to the other branches; and while Dr Reid freely states his opinions on this subject, he trusts that he may do so without being wanting in that respect that is due to the opinions of others, where he may be reluctantly compelled to differ from them. There is no science more eminently practical than Chemistry, and none more broadly connected with all the relations of the material world, or with the various departments of that profession to which the members of both Colleges are attached. They all desire that it should be studied, as far as may be compatible with the time the student has to devote to other pursuits; and Dr Reid is sanguine enough to hope, that they will agree with him in considering, that it requires a more minute attention than has hitherto been bestowed upon it. What, then, would be the effect of removing the restriction to which he has adverted? Teachers of Practical Chemistry would then be able to give a course four or six times the extent of their present course, without imposing upon the student any additional burthen beyond a guinea or twenty-five shillings for the expense of the additional materials consumed in his experiments. They would no longer be confined to a three months' course, or to a course of one hour a-day, in which the teacher is placed in the very disagreeable dilemma of either passing more quickly than he ought to do with the subject of the course, or of confining his attention to that which the student considers only a part of what he might reasonably expect to have been included in his course. In short, the student, instead of being limited to the laboratory for an hour a day, for half the winter session, would have it thrown open to him every day for several hours during a six months' course. He would study the Practice of Chemistry as a professional student, instead of sacrificing no small part of the great advantages it offers, principally to the purpose of making it more subservient as a means of enabling him to answer questions at the examinations which he has to undergo in taking his degree; or he would be as competent, with this extended course, to go practically through many operations, as he is at present able to explain them.

It may also be stated, that when the late Dr Turner (Professor of Surgery in the University), and other members of the Royal College of Surgeons, proposed to Dr Reid that the classes of Practical Chemistry should be restricted to seven, he then stated that a restriction to this extent would probably put a stop to the teaching of Practical Chemistry, except at such a price as would permit only a few individuals to take advantage of it.

Again, this arrangement would enable the teacher to study more particularly the capabilities and progress of each of his pupils. It will be admitted by all who have examined most minutely into the subject of education, that this ought to be the great object of every teacher. The leading facts and principles of science are to be seen in numerous elementary works; the experience of the teacher, therefore, is most valuable in assisting the student in any difficulties that may be peculiar to each, in teaching him that practice which actual experience can alone communicate, and in exciting and sustaining a proper spirit of scientific inquiry. And while engineers, artists, agriculturists, architects, manufacturers, and all who study any peculiar art or profession, are assisted each in their own department, surely it is now high time to inquire into the changes that may be necessary to put the study of Practical Chemistry in such a form, as may fulfil the intentions of those who have advocated the importance of adding it to the curriculum of medical education. In short, it is submitted, that there can be no real objection to the placing of the Practical Chemistry class upon the same footing on which Practical Anatomy has so long stood.

But, it may again be asked, when is the student to find time for this extended course? According to the Regulations of the Royal College of Surgeons, the student is recommended to study Practical Chemistry during the THIRD SESSION. This is the year, however, when he commences his attendance at the Hospital; it would thus be difficult for him at this period to devote the time required for such a course. During the SECOND YEAR, his attention is very much occupied with Practical Anatomy; and during the FOURTH or last year of his studies, he is equally engaged with the Hospital, Clinical

Medicine, Surgery, and other classes, which certainly include as many subjects as he can reasonably be expected to attend. But, during the first year, CHEMISTRY and ANATOMY alone engage his attention, if he shall have previously studied Natural Philosophy. He has, therefore, abundance of time this session to conjoin the study of the Practice of Chemistry with his attendance at lectures; and thus, each successive session, he would be engaged practically with the various branches of his profession.

It may be said by some, that there is an advantage in studying Practical Chemistry the third year, as it serves as a recapitulation previous to the final examination on the fourth session. The force of this objection is admitted; but, on the other hand, it is perhaps counterbalanced by the circumstance, that the more thoroughly the student is acquainted with Chemistry, the more easy is it for him to advance with more and more success in all the varied studies to which he must afterwards attend. The well-informed Chemical student, in his attendance at lectures on Anatomy, Physiology, Botany, Dietetics, Materia Medica, Pathology, Toxicology, and Medical Jurisprudence in general, Surgery, Practice of Physic, &c., continually, indeed almost daily at times, has to draw upon his knowledge of Chemistry; and without this, how imperfectly could any one prosecute these sciences. And in his first attempts at practice by himself, how often does the beginner add to the sufferings of his patient, from ignorance of pharmaceutical details. Cases of this kind have come under my own observation, and may probably be familiar to many who have looked particularly to this point.

But there is another view of great practical importance, which may here be mentioned. If the student shall be thoroughly informed on Chemistry by attendance at the extended practical course now proposed, he will be so intimately acquainted with the science, and acquire such a power and command in experimenting, that he will not fail to experiment from time to time by himself, in conducting his future studies. And though he may not then have the facilities and variety of apparatus he may have been accustomed to use in the laboratory, still by adopting, as a means of experimenting, the

mode of analysis so ably followed by Dr Wollaston, in operating with minute quantities of materials, he may, indeed, at the most trifling expense, renew again and again, and go over deliberately at home, all the principal tests and illustrative experiments he may have seen conducted on the large scale in the class-room. The experience of several years has shewn—

1. That, for an expense so small as six or seven shillings, the student of Chemistry may provide himself with about sixty specimens of the most useful chemicals, including all the most important elements, or some of their principal compounds, with five phials containing sulphuric, nitric, and muriatic acids, potassa, and ammonia.

2. That with the use of the simplest means, namely, the slips of glass which glaziers throw away, and of cartridge-paper, test-paper, and filtering paper, thousands of experiments may be performed with the above materials. For on these slips, he can not only hold solids and fluids, but also dissolve, boil, evaporate, filter, mix, fuse, and even distil, after a very little practice, besides conducting numerous other chemical operations. And thus, he has also the power of renewing a course of Chemistry to himself in his leisure hours during the autumn, and even of extending a knowledge of chemical science among his friends, or in a distant region where the usual facilities for chemical operations are not to be obtained.

3. The extent to which these have been used has proved that the students are not indisposed to make use of the very simple means now recommended for enabling them to acquire practice in the examination of chemicals, and in the detection of adulterations; while the frequency with which they are thus enabled to experiment leads them to acquire a familiarity with the facts and resources of the science which it would be difficult for them to obtain in any other way. With the FLAT-GLASS APPARATUS, a FEW TUBES, and a BLOW-PIPE, there are few test experiments which cannot be performed.

To assist in the introduction of this mode of testing, so accessible to every student, introductory lessons on chemical analysis are given every Saturday morning in Dr Reid's class-room, from 10 to 11, where every student endeavours

individually to find out experimentally the nature of the materials placed before him, according to the lessons inculcated at the same time, and as these may be visited on any occasion when any of the members of either College may desire to see this mode of testing, it will be unnecessary to mention more minutely here, what five minutes' inspection would more thoroughly explain than the most lengthened description.

There are also other means which will naturally suggest themselves to every teacher as powerful methods of stimulating the student to a better knowledge of his subject, particularly, for instance, giving him small quantities of materials home with him to study at his leisure, and by correcting the conclusions he draws from the experiments he makes. By giving an opportunity also to the pupil to execute some difficult experiment, and to prepare some compound that requires much skill and attention, he is led to enter upon the more elaborate series of chemical investigations.

The symbols introduced by Berzelius assist greatly in all these arrangements. They, indeed, constitute the greatest boon that has been conferred upon the science since the introduction of the atomic theory. Without them, indeed, the teacher and the student would be equally at a loss in following the progress of modern Chemistry. To those whose professional engagements may not have led them to attend to them minutely, it may be remarked, that, without them, Chemistry would at the present day be in the same position as arithmetic or algebra, were every operation in these branches expressed at length by words, without the use of signs and figures.

DISCIPLINE, ANNUAL EXAMINATIONS, &c.—Whatever may be the conclusion to which the preceding observations may assist in leading, it is trusted that another question will be taken up at the same time, viz. the introduction of some system of discipline to which all professional students shall be subjected. At present, there being no appointed tutors to watch over the progress of the student, all who have no particular friends or guardians in this city, are too frequently left entirely to their own superintendence. The consequence is, that among the great number of students who frequent this city, there are

always several falling into mistakes as to their course of study, productive of the greatest injury to their future progress. Nor is this all, for when the arrangement of the time is in a great measure optional each successive season, however fixed the rules may be as to the classes that must ultimately have been attended, and where the student looks forward merely to a single examination at the distant period of four years, he is frequently careless of immediate consequences, consoling himself with the idea that this is only his first session, and that he will make up for it by working harder at a future opportunity. Thus he proceeds, from year to year, always involving himself deeper, until at last he finds out the reality of his situation, and now it is necessary to abandon all ambition of passing his examination in the manner he would desire. To get through, in any way, is his great object; and to enable him to have any chance of this, he hurries on from subject to subject in a manner incompatible with that sure and regulated progress which the steady and systematic student alone can ensure, while he subjects himself to a species of torture in the mean time which leaves occasionally an impression upon his future life.

It is willingly and gladly acknowledged, that in no place, as a body, are the students more honourable in their conduct, more devoted to their profession, or more anxious to seize hold of every opportunity which they may have of improving themselves in the course of study they may follow. Their conduct in after life—the eminence to which they have risen,—their independence and enterprize in every quarter of the globe,—and the principles which they have imbibed,—have given them a character which, it is hoped, they will ever continue to enjoy. It is only maintained at present, that, among so many, cases such as are described occur too frequently not to render them an object deserving the most serious consideration of those who may be expected to examine into these matters. And, on looking to those whose conduct and attention gives their teacher the best proof that they are advancing as steadily as he could expect or desire, how much more pleasing would their progress be were it certified from time to time by some public board? How much would this stimulate them

in their future progress? How cheerfully would they enter upon a new branch of study, when assured that they had done their duty and succeeded in what they had already studied? A light and a glad heart would accompany them in their future academical career, recollecting that they had merely to keep up for their final examination what they already knew in the branches they had studied. But, at present, in a number of sciences, where the student has not that precise and definite series of problems presented to him, such as are seen in the Mathematics, he is frequently uncertain how far he may have advanced in the right tract,—a constant, and in some cases a distressing, anxiety as to the result embarrasses his progress. And, if the case of a student having these feelings, and going up for an examination after a few years' course of study, be considered, when he is to be questioned upon Anatomy, Chemistry, Practical Chemistry, Pharmacy, Materia Medica, Physiology, Surgery, Practice of Physic, Midwifery, Medical Jurisprudence, &c., he certainly requires to summon no small degree of moral energy in entering upon such a trial. It would therefore be important to ascertain the possibility of enabling the same end to be accomplished by means which may not be so distressing in individual cases, and equally effectual, if not more so, in raising the general standard of professional excellence.

It will also be obvious, that the public have a better security for the thorough education of graduates, by annual examinations, than by the present system; for cases certainly must occur where the examiner may be considered as called upon to insist less on high attainments in each science, than he would do if the student appeared before him annually after he had concluded his studies for the session.

View also the case of a rejection where the student is first told of his inefficient study, or, it may be, incapacity for the profession, after two or four years have been devoted to it, without a single official warning, and perhaps even where he might have, however erroneously, looked forward to a very different result. Surely the views now so generally entertained as to education are almost unanimously in favour of those periodical examinations, which are enjoined in so many other cir-

cumstances where it is an object to check the possibility of a mistake, and avoid by every possible means a termination equally unpleasant to all parties.

Again, while the new Regulations of the Royal College of Surgeons, and the opening of their invaluable Museum, have done so much to forward the cause of Medical Education, it cannot be doubted, that, if an Education Committee were appointed, composed of Fellows of both the Royal Colleges, much might still be done to advance the interests of the medical profession, of the public, and particularly of the students. Great as the fame of this School of Medicine has been, and proud as its pre-eminence is, in having been open without restriction to every individual, without distinction, who wished to avail himself of the advantages it holds out, still it is impossible, and it would be equally useless, to attempt to conceal the fact, that, with the views of education now so widely gaining ground, the parents, friends, and guardians of the younger pupils, now anxiously look forward to some guarantee, that they shall not be without some special protection and assistance from some board or public office, which shall inquire at least from time to time as to their progress; and that the practice of a student going up for his final examination, without having previously been made aware, more than once, of his success or his failure in his studies, will give way to a more precise system, as soon as the fluctuating state of medical education, and the variety of opinions entertained upon this subject, shall have fixed into a more settled form.*

In concluding these observations, Dr Reid trusts that the importance of the subject will excuse the imperfect outlines his limited time has permitted him to detail at present. His great desire has been to bring forward such facts as may lead to an inquiry into the consequences that ensue from the defective state of the present arrangements for the study of Practical Chemistry. He has noticed every successive season

* The introduction of calisthenic exercises, or such games as would promote the health of the student, appears also an object well deserving of public attention.

the students display more zeal, more intelligence, and come forward better prepared for taking higher and higher ground in their scientific studies; but the circumstances stated have proved an insuperable barrier to every effort that has been made to give it the practical efficiency it requires. The student who attempts to perform what he desires to undertake within the limited period allotted by the ordinary course, is continually in danger of falling into a rough and hurried mode of operating, which would speedily give way, by new arrangements, to that calm and deliberate precision and accuracy, so much and so justly the boast of many continental institutions. This would soon be followed by the appearance at this school of young men as distinguished in the ranks of Chemistry and Pharmacy, as they are to be met with in foreign countries. And as to the adulteration of drugs, the same means would be equally effectual in training the young apothecary to those methods by which alone he can judge of the purity of the articles he dispenses, and in enabling the physician and the surgeon to ascertain if his prescriptions are carefully and accurately made up.

ON SOME STATES WHICH RESEMBLE INFLAMMATION.

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It is strange that, while the cultivators of medicine are so numerous, and their zeal and assiduity so thoroughly unwearied, it should still be a matter of question whether the art be now in a progressive state. The more general and perhaps the nearly unanimous opinion is, that medicine is advancing with a steady progress to perfection, but, meanwhile, a few names, not undistinguished in science, maintain that there is no real progress, or only progression in the circumference of a circle, that is, constant motion, but, at the same time, constant return to the position formerly occupied. Dr Francis Home, in his Treatise on Croup, published in 1765, observes that "the science of medicine has been gradually advancing for the 2000 years bypast, and is now brought to a great degree of improvement, perhaps to as great, every circumstance considered, as the difficulty of the art, the limitation of the human faculties, and the continual attempts to further refinement, too often conducted merely by fancy, will admit of." We smile at the boast of Dr Home, and think of the improvements and discoveries since his day; but we are as ready to plume ourselves as he was on the existing state of medicine, and we find nearly his own expressions made use of by writers of the present period. But what are the real facts of the case? Is medicine truly progressive, or is it stationary?

When we think of medical hypotheses, we may very readily adopt the latter opinion. We observe now the same restless search after first principles, and the same disposition to gather these from a few observations, which characterized the more ancient physicians; and even the younger members of the society will recollect opinions started by their zealous inventors as irrefragably certain, which a very few years have first undermined and then demolished. With regard to new diseases, do we not find hints of almost every one in the older authors, and do not the critics of the present day often detect in this way the plagiarism of modern discoverers? If we turn our attention to remedies, we find much to discourage our boastings. Disease appears to be as rife as it was in former days, and our vaunted improvements in the materia medica have not made death less frequent than before, have not added to the average duration of human existence. Increased longevity has not yet been attained, and if there be any diminution in the rate

of mortality, it is attributable not to the increased power of medicine, but to those happy arrangements of modern civilized society which have prevented the frequent occurrence of famine and of its usual attendant, pestilence, which have provided for the more perfect clothing of our people, and the greater cleanliness of their dwellings. Chemistry has, indeed, done her best in analyzing and combining various medicinal agents, and every now and then some bright idea, some splendid panacea has been elicited from the laboratory like a spark from its furnace ; but the *currus triumphalis* of the one has been scarcely more lengthened than the blaze of the other. Whether we inquire as to the discovery of what was before unknown, or as to the actual power which medicine now possesses in controlling disease and adding to human happiness, as compared with that of other times, we are hurried into conclusions which tend to nearly universal scepticism.

And yet there must be some fallacy in this reasoning, for our knowledge of the animal structure and of the bodily functions has received large accessions. If we are not better acquainted with the proximate causes of diseases, we are at least much better acquainted with their effects, from the study of morbid anatomy. We possess all the remedies which were known to the ancients, and many new ones of great power have been discovered by the researches of modern observers. The possession of knowledge does, to a certain extent, imply the possession of power : and hence we must necessarily have more power in the cure of disease.

But while it is undeniable that our science has made advances in modern times, yet it appears to me that the principal improvement which has taken place is, that a greater number of practitioners are now masters of the existing knowledge, and hence that a greater number of practitioners are, not discoverers, but intelligent and industrious appliers of the discovered truths, both as to diseases and their remedies. I infer this from the increased means of instruction possessed by the profession, both in the schools and by the extended diffusion of medical literature. Formerly knowledge was more difficult of access, and only the men of original genius or of unusual assiduity could acquire much of it ; but it is now open to men of more ordinary minds and of more commonplace habits.

We must never forget, however, a circumstance which influences all our opinions on this matter ; I mean that each practitioner is himself in a state of progression. If he be a man of even common observation, every day is adding to his stock of knowledge ; not only to that which is derived from books, but to that more precious knowledge which is gathered from experience, which each man learns for himself, and which no man can communicate to another. It is this which is daily changing, and at length revolutionizing the mind of each practitioner, and by virtue of which

he differs more from what he was twenty years ago than he does from the practitioner of the bypast century.

There can be no doubt that the difference between the more experienced physician or surgeon and others consists mainly in the correctness of his diagnosis. The application of the remedy to the ascertained disease is comparatively the easier process. It requires, indeed, no great skill to determine that one patient is afflicted with dropsy, that another has palsy, that a third is affected with fever, that a fourth suffers from dyspepsia. But what organic lesion has given rise to the watery swelling, what is the state of the brain indicated by the palsy, how the vital organs are affected in the individual case of fever, whether the dyspepsia be functional merely or organic,—these are questions which, to be answered correctly, call for the enlightened skill of the most accomplished practitioner. Upon the diagnosis will the treatment depend, and that treatment will influence the life, or at least to a great extent, the well-being of the patient. The disease itself may have been ascertained, but the stage at which it has now arrived requires also to be determined: for the treatment which was appropriate at one period may be inert or detrimental in the subsequent progress of the case.

A considerable number of diseases are inflammatory, or at least consist of that congestion of the vessels which frequently passes into the state of inflammation. If we reckon up the various tissues of the body, and recollect that every one of them is susceptible of inflammation, acute, subacute, or chronic, the number of cases occurring in a climate such as ours cannot be matter of wonder. To take only one example. The lungs comprise at least three tissues, the investing membrane, the lining membrane, and the parenchyma intervening. Each of these is liable to inflammation, and hence we have pleuritis, bronchitis, pneumonia. But each of these forms of disease is modified as to activity and duration, besides the peculiar constitution which each individual possesses; and each of these modifications demands its appropriate mode of treatment.

When inflammation occupies any of the external parts of the body, its presence is characterized by the signs of redness, pain, heat, swelling. These are present to a greater or less degree, in every example, and their conjoint existence is necessary to constitute inflammation. When one of the internal organs is affected, as we have no opportunity of using the senses of sight and touch, we infer the existence of inflammation from pain in the affected part, disorder in its function, and the febrile state. These, however, are not infallible signs of inflammation. There are many circumstances which mask the real nature of the disease, and lead away the attention from it to some of its consequences, or to some

accidental symptoms which are connected with it. Again, there are various affections which simulate inflammation, assuming some of its characters, and thus leading to a treatment that is inappropriate. Some of these are more important than others, but in every one of them a correct diagnosis insures a correct treatment. It is my wish to call the attention of the society to some examples of this, and although I have nothing to communicate which is not already known to many of its members, yet the frequency with which errors are committed regarding it, (many of which have been committed by myself,) leads me to believe that the attempt will not be uninformative.

1. The most obvious example of a diseased state resembling inflammation, and yet calling for a very different treatment, is *chilblain*; and I mention it first, because it is so obvious, and because there is no difference of opinion among surgeons about it. It is always attended by redness, swelling, a tingling pain, and the sensation of heat, even though there is no actual increase of temperature. So far it resembles cutaneous inflammation, but it is never treated as such; and we all know that to detract blood from the part, or to apply the warmth and moisture of an ordinary poultice, would be likely to produce sloughing or unhealthy ulceration. It is treated by stimulants and anodyne applications, and these are found beneficial not only in the primary affection, but in the ulceration which so often succeeds.—In cold weather we often observe an approach to the state of chilblain in the purple-coloured hands and feet of children and invalids. Insane patients are especially liable to it; indeed, with them and many others it is observed in weather when no real chilblains are to be met with. In scrofulous children, in young females with imperfect menstruation, in old victims of intemperance, the purple countenance, hands, and feet, are of common occurrence, and all mark a languor in the capillary circulation which is to be removed, not by local or general depletion, but by the judicious use of a stimulant and nutritive diet. This purple colour of the surface is sometimes designated as a florid complexion; but it is essentially different from a natural bloom, or from healthy plethora (if such a term be admissible,) and generally indicates a state of the body in which great depletion is not well borne.—There may seem to be no great connection between chilblain and erysipelas; but it will be convenient to place under this head some remarks on the latter disease. Many cases of erysipelas are examples of genuine inflammation, having all the characteristics of that state, and passing regularly through its various consequences of effusion, suppuration or gangrene. But there are other cases which in their origin, progress, and termination, are altogether different. They often proceed from mere gastric irritation, (as urticaria usually does,) and are removed as

rapidly as they first appeared, by remedies directed to the digestive organs. The tendency of erysipelas to migrate from one part of the surface to another, or suddenly to be translated to an internal organ, leaving the first seat of attack entirely free from disease, marks it out as somewhat different from common inflammation. And, while energetic treatment is sometimes indispensable to preserve the limb or even the life of the patient, the very common (once the universal) practice of merely covering the affected part with dry flour, indicates very significantly that, in other cases, the do-nothing practice is quite sufficient. The truth is, that under the name of erysipelas we comprehend several affections different from each other, and it is very desirable that they should be distinguished more correctly than they are.

2. *Chronic Rheumatism* has no claim to be called an inflammation, and is rather a consequence of that state; but it consists of severe pain, and the affected joints are always more or less swelled. It is a very intractable affection, often tiring out the patience of the practitioner, and affording a favourable opportunity for the empiric. Leeching has sometimes been tried, but seldom with any benefit, and the treatment which is most approved consists in counter-irritants, alteratives, the warm bath, and the assiduous application of the hand-cure by shampooing. Acute rheumatism is generally treated in part by blood-letting; but the rule laid down by authors as to the treatment of internal inflammation, viz. that we are to bleed so long as the buffy coat appears on the blood drawn, is quite inapplicable to his disease. This appearance is shown after every bleeding, and is not less characteristic even when the patient is exhausted to an extreme degree. This circumstance marks out rheumatism as differing from other inflammations; and the capricious nature of its movements, deserting one joint, which it leaves free from uneasiness, and attacking another which had previously been so; and then suddenly leaving all the external parts to attack the pericardium, would lead us to hesitate before we adopt the rule of bleeding for effect.

3. *Pleurodyne* is an affection of the muscles covering the sides of the thorax, or of the intercostals. It consists in severe pain increased on inspiration. It is sometimes a mere sprain of those muscles produced by some unusual effort, but often it is the result of cold, is attended with catarrh, and hence there is more difficulty in distinguishing it from pleurisy. The chief means of doing so are that in pleurodyne the pain is more severe, is increased by muscular exertion, and usually abated by pressure, while in pleurisy there is a quickened pulse and other symptoms of febrile action. In pleurodyne the relief afforded by the pressure of the hand, or the support of a bandage or plaster, is astonishing. Some eminent men have considered the state of the pulse as the

best index of the real nature of the case. The second Monro was in the habit of remarking, that whenever he found inward pain along with a quick pulse, he always found blood-letting advantageous. It is certainly a valuable guide, and I lately attended a case which I considered a muscular affection, and treated accordingly; but where the quick pulse suggested another opinion, and the decided relief which followed a full bleeding, rather showed that that opinion was correct. It is possible that in that case the pleurodyne did exist, but speedily passed into the pleuritis. The popular opinion, that the lancet affords the appropriate remedy for every "stitch in the side," is so very strong, that it is difficult to refuse the patient's request. No great evil follows the practice when the patient is a stout labouring man; but when a delicate female is the sufferer, she may be materially injured by a full bleeding, and hence it is wise to insist on the more suitable remedies.

4. *Rheumatism of the Abdominal Muscles* often resembles inflammation of the peritoneum, and the diagnosis is of great importance. There is in both tenderness to pressure, (the absence of which characterizes colic;) there is great difficulty of moving, either turning in bed or rising up to the sitting posture; there is often nausea and vomiting, and the grinding uneasiness among the intestines, showing that their functions are in disorder; and there may be constipation tending further to confuse the practitioner. In such a case the diagnosis will be derived mainly from the pulse. In peritonitis the pulse is always accelerated; sometimes it is more wiry in its beat, sometimes more thready; but in the muscular affection the pulse is not necessarily quickened, and when the patient has been quiet for a little while, not disturbed by motion or agitated by alarm as to danger, it will be found nearly natural. Pressure, too, may furnish some assistance to the diagnosis, because while a light pressure may, as in peritonitis, cause severe pain, on the continuance of the pressure, the pain does not increase as it invariably does in that disease, but rather becomes more tolerable, and to such an extent as even to invite its repetition.

Perhaps the very state of mind of the patient may offer a useful hint to the practitioner. It is well known that in peritoneal inflammation there is always severe suffering, but there is frequently a degree of mental calmness which continues even through the whole course of the disease; on the other hand, in many of the cases referred to as simulating that disease, there is hurry, anxiety, impatience, indicative of the nervous or hysterical temperament. That true inflammation may coexist with the hysterical state is undeniable; but in a large number of cases of this kind, the presence of pain will mark, not the genuine, but the simulated disease.

5. *Headach* arising from a disordered stomach is well known to every one. Every one has either felt or observed the acute pain which follows repletion from the ordinary viands of a dinner table, or excess in vinous liquors. But no one could suggest blood-letting as the remedy, although the local pain, the quick pulse, the disordered functions of every part of the system would at first seem to call for its employment. Experience shows us that an emetic, a purgative, a stimulant of another kind, sometimes mere abstinence from food, restores the healthy state of the stomach, and removes all the unpleasant sensations from the head.

Probably there are other cases of pain in the head originating in the same cause, (disordered digestion,) which we are too apt to view as inflammatory in their nature, and as calling for the deduction of blood. The pain in hemicrania, fixed as a nail in one spot of the head, and usually intermittent in its character, is such an instance. It is generally a symptom of deranged digestion, and calls for regulated diet, purgatives, and quinine. It does not call for blood-letting, and although it is sometimes relieved by loss of blood, this is no proof of its being the best treatment. Yet cases do occur not unfrequently in which the severity of the pain, and the immediate relief afforded by leeches, draw away the attention both of the practitioner and patient from the real seat of disease, the stomach and bowels. The perfect recovery which occurs in such cases is to be ascribed more to the native vigour of the system, enabling it to bear with impunity an injury inflicted, or rather to the regulated diet and medicinal remedies which are intended to be used as auxiliaries, but which are in effect the principal agents in the cure.

In cases of this kind there is no imminent danger to life, and, of course, the error in treatment is not seriously prejudicial; but in *delirium tremens* and in mania, the hazard is much greater. In the former affection pain is not a constant symptom, but it is a frequent one, and whenever the patient's attention is diverted for a little from his imaginary cause of alarm, uneasy sensations in his head are invariably referred to. I need not say that, notwithstanding such symptoms, blood-letting is not the approved remedy; and that while there are cases in which it is borne without injury, in which perhaps its employment is demanded, in a large majority of instances, remedies of a very different character are found most beneficial. Narcotic stimulants, counter-irritants, and purgatives are used with the best effects; whereas blood-letting has not unfrequently retarded the recovery, or even hurried on a fatal termination. There is reason to believe that in some cases of suicide, committed under the influence of the alarm or depression attending

delirium tremens, the hemorrhage has proved fatal, although it had proceeded to only a moderate extent.

There are cases of mania to which the same remarks are applicable. Cerebral excitement and vascular turgescence are present to a considerable degree ; there are urgent and alarming symptoms, but there is no real inflammation, and blood-letting is not the appropriate remedy. It requires some fortitude to withhold the lancet in these cases, but the practitioner is well rewarded for his forbearance, by finding a more rapid and more complete recovery. I have no intention to proscribe blood-letting in all cases of mania ; but cases such as I have referred to are of pretty frequent occurrence.

6. But perhaps the *Epidemic Influenza* offers the most striking illustration of the principle which I am insisting on. Ample records have been preserved of this curious disease as it appeared in 1782 and 1803. Since that time we have all had opportunities of observing it in 1833 and 1837. It was a febrile disease with severe local symptoms, lasting for three days, and terminating by profuse perspiration. This description applied not to all but certainly to nine-tenths of the cases observed in Edinburgh. The commencing febrile symptoms were so violent that they seemed to mark an attack of continued fever. The local symptoms, which were most severe on the second day, and which were usually referable to the organs of respiration, seemed to indicate an alarming inflammation of some one of these. They would have called for bleeding under any other circumstances ; but bleeding was scarcely ever had recourse to, and when it was employed, it was not so much for the original disease, as for a modification or sequela of it. With a quick and hard pulse, a hot and dry skin, severe headach and constant cough, nothing would have justified the neglect of blood-letting, but the certainty that it was influenza, and not real bronchitis or pneumonia, and that in a few hours it would pass off under other remedies.

7. *Continued Fever* is perhaps the most important, as being the most extensively fatal of all diseases. I am desirous of making the preceding remarks on other diseases, bear upon it ; but the notice at present must be very short. When we consider that a large proportion of recoveries take place without leaving any morbid sequelæ behind, and that in many of the fatal cases, no disorganization of structure can be detected, it is highly probable that fever differs from inflammation in its pathology. Inflammation leads to morbid degeneration in a large number of cases, and these become apparent, whether recovery takes place, or the termination be fatal. Now, inflammatory symptoms are present in almost every case of fever. Some one organ is peculiarly affected with pain and disturbance of its functions. The symptoms call for watchful

anxiety on the part of the medical attendant, but they do not follow the course taken by idiopathic inflammation, and they yield to remedies of no great efficacy, or, at least, to a much smaller loss of blood than such an inflammation would demand. No one would leave pneumonia to the measures which are unhesitatingly had recourse to in the local affection of fever; and hence, we must infer that the two diseases are different in their nature.

I have now mentioned several forms of disease (and additional examples will perhaps suggest themselves to other members), in which there are symptoms resembling those of inflammation, but which a careful observer will be able to distinguish from them. They indicate, indeed, a different disease or stage of disease; sometimes a merely congested state of the blood-vessels, which may easily pass into inflammation; sometimes a state which is rather a consequence of inflammation; sometimes a local affection entirely *sui generis*; sometimes a congeries of local symptoms not arising from local disease, but symptomatic of disease in a remote part of the body. The resemblance to inflammation is sometimes so great as to perplex and agitate a young practitioner; and the importance of a right diagnosis is so much the greater, because the treatment appropriate to inflammation is prejudicial here. The eagerness with which we bleed in all cases supposed to be inflammatory, the anxiety with which this remedy is even called for by the patients, makes it the more necessary that we should commit no mistake. True it is that the ruddy complexions and robust constitutions of many of the patients, assure us that they will get no harm from the loss of blood, and that possibly it may do them good, at any rate. But these, I think, are only a small portion of the patients who apply to us under such circumstances. A large number are females of irritable and hysterical habits, men whose powers have been debilitated by a course of intemperate indulgence, or half-nourished children of the poor, whose strength is deficient, instead of superabundant. To abstract blood, in any considerable extent, from such patients, will incur the risk not only of allowing the present illness to continue unsubdued, but of leading to organic disease, of bringing on confirmed mania, and even causing premature death.

I am quite aware that the converse of this statement is equally true. Real inflammation is frequently subacute in its attack and insidious in its progress, so that the practitioner is thrown off his guard, and allows the disease to produce irremediable mischief. Many such cases there are, where organic disease has been mistaken for mere functional derangement; where subacute inflammation of the cerebral membranes has been allowed to proceed unchecked to fatal effusion; where pneumonia has been imperfectly recognized, and therefore, imperfectly treated; where peritonitis has

been mistaken for colic. But these examples are just proofs of the necessity of careful observation on the part of the practitioner, and show not only how much caution must be exerted but how much alertness should be manifested with regard to every case which is placed under his care. The routine treatment which is so frequent in the profession, and which the indolence of advancing years is so apt to produce, is generally the consequence of an imperfect education, and of misimprovement of the advantages possessed in youth. The best safeguard is for a young man early to acquire habits of careful observation, of taking nothing for granted, and of seeing every thing with his own eyes; and while he pays a due regard to the experience, and even to the opinions of his seniors, to observe for himself and to think for himself; above all, to allow no symptom to pass by unheeded, and to ascertain, so far as he can do, the effect of every remedy which he employs on his patient.



