

## OBSERVATIONS

ON THE IMPORTANCE OF  
THE STUDY OF BOTANY,

AS A BRANCH OF MEDICAL EDUCATION;

*Addressed to the Botanical Class in Queen's College, Birmingham, at the close of the late Summer Session, 1845.*

By G. B. KNOWLES, Esq., F.L.S.

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND,  
PROFESSOR OF BOTANY AND MATERIA MEDICA IN QUEEN'S COLLEGE,  
AND SURGEON TO THE QUEEN'S HOSPITAL.

GENTLEMEN,—In concluding this course of lectures on physiological and practical botany, I would again endeavour to impress upon your minds the necessity of devoting to each subject of medical study the requisite degree of attention; each of them is essentially important, and not one of them can be neglected by the student without some consequent disadvantage. As respects botany, you are doubtless aware, that within the last few years it has very properly been introduced as a necessary part of a liberal education; and that, consequently, the students who present themselves for examination at the London University (whether intended for the medical profession or otherwise) are required to possess a certain knowledge of the Flora of Europe, according to the system of De Candolle. As connected with the medical profession, botany has long been considered as an indispensable branch of medical studies.

While thus advertent to the importance of botanical knowledge to the medical practitioner, (a point upon which I dwelt with much earnestness in the introductory lecture of the present course,) I cannot avoid expressing my surprise that some students should still regard it with a degree of indifference, bordering, in fact, upon neglect; for although regular in their attendance upon lectures, they do not appear to take that interest in the subject which is manifest in those who devote themselves zealously and perseveringly, not only to this, but to every other branch of medical study. Why is this? It may, perhaps, be attributed to a supposed want of time, and the consequent impossibility of carefully studying and properly digesting all the different subjects; and that, on this account, some one or two subjects being regarded as of minor importance, are doomed to receive a less degree of attention. For instance, I have known students pass admirable examinations in anatomy and surgery, who have made themselves but indifferently acquainted with forensic medicine. Again, I have known others devote a large share of their attention to materia medica, and acquire an extensive knowledge of therapeutics, who have neglected to make themselves botanically acquainted with those vegetable productions which, in the course of their practice, they will have such frequent occasion to prescribe.

In advertent to these circumstances, I am fully aware of the multiplicity of subjects which, in the present day, are required to constitute a comprehensive course of medical education; and I am equally aware of the difficulty which the student must experience in giving to each of them the requisite degree of attention, each requiring to be closely and profoundly studied, all being more or less intimately connected, and not one of which can by any means be dispensed with. I am, however, decidedly of opinion, that the difficulty does not arise so much from the actual want of time, as from an inattention to its methodical arrangement. To divide the day into certain portions, and to devote each portion to one particular object, is a plan that is perfectly practicable, and will be found by the student to embrace many advantages. It is not unusual to meet with some individuals whose actions are so regulated by system, and to whom the methodical employment of time seems so natural, and to form so striking a feature in their character, as apparently to be the result of some innate special faculty. On the contrary, we meet with others who are as remarkable for their deficiency in this respect, who are never influenced in their actions by any regard to arrangement, who, instead of seizing time by the forelock, may be said rather to take time as they find it, and are observed, for the most part, to occupy themselves with those things first (whether of pleasure or profit) which may first happen to attract their attention. Thus the day passes on to its close, and is found upon reflection to have passed unsatisfactorily; little has been done; nothing has been well done; and some things have been altogether left undone, and postponed till the morrow. The morrow arrives, and is passed like the previous day, without method, and, consequently, without its attendant advantages. It may be safely asserted, therefore, that to every student a methodical division and appropriation of time is a matter of the utmost importance,

not merely on account of the immediate advantages which it invariably affords, but as laying a foundation for those habits of order and regularity which are so essentially necessary to our success in our progress through life. Talent and perseverance are the principal means by which a man is enabled to raise himself above the common level, to high professional fame, and honourable independence; but let it not be forgotten that talent and perseverance are found, not unfrequently, to fail in attaining their object for want of a just appreciation and methodical employment of time. Time is, in fact, the most valuable of all things—more valuable than the precious metals, or the brilliant diamond, and should therefore be spent with prudence and circumspection. Wealth may be squandered, and a fine estate may be dissipated by negligence and extravagance, yet by industry and economy the loss may be sometimes retrieved; but time once past can never be recalled, and if spent unprofitably, can only be remembered with unavailing regret. A late eccentric, but powerful writer, in speaking of time, has very pointedly remarked, that “wisdom walks before it, opportunity with it, and repentance behind it; he that has made it his friend will have little to fear from his enemies; but he that has made it his enemy, will have little to hope from his friends.”

In proof of the advantages to be derived from a methodical and judicious appropriation of time, I might quote numerous examples both in ancient and modern times; but it is unnecessary to look beyond the limits of our own profession. I will therefore refer you at once to some of the distinguished practitioners of the present day,—men who, although absorbed in extensive practice, and occupied with a multiplicity of public and private engagements, still find time (either late or early) to commit to paper, and eventually to place before the public, the result of their studies, their observations, and their experience. If, indeed, we look around and observe what some individuals have been able to effect under such circumstances, it must excite our wonder no less than our admiration. Be it remembered, however, that such results can only be produced by the means to which I have already alluded—namely, by industry and perseverance, aided by a methodical arrangement of time, and a just appreciation of its value. But surely no argument can be necessary to convince any reflecting mind of the value of time; and the student who has formed a just estimate of the nature and the importance of the profession into which he has entered, must be fully aware that the period allotted to his initiation is by no means too extensive for the purpose, and should, consequently, be devoted to regular and systematic study. That certain intervals of relaxation are necessary to the mind as well as to the body, is not to be denied, but the utmost care should be taken that such intervals be not enlarged beyond the bounds of prudence.

But to return to our inquiry. How are we to account for the fact, that in the class of botany there are usually some students who do not devote to the subject that degree of attention which its importance certainly demands? That it cannot be owing to the actual want of time is certain. It may rather, perhaps, be attributed to want of inclination; to a want of taste for studies of this nature. But whatever may be the cause, it is greatly to be regretted. It is to be regretted, indeed, on many accounts;—it is to be regretted, because botany is so intimately connected with materia medica that a knowledge of it must give you more correct views of vegetable remedies; of the tribes or families from which they are obtained, and the countries where they grow. It is to be regretted, moreover, because the study of botany has a direct and decided tendency to enlarge and improve our mental perceptions. The late Sir J. E. Smith, a distinguished botanist and physician, has said “that nothing tends more powerfully to awaken in the youthful mind a spirit of inquiry, or more effectually to sharpen its powers of discrimination, than the study of natural history.”

But notwithstanding the various arguments I have adduced to prove the importance of this branch of medical education, I can readily imagine that some among my hearers may be inclined to think that the study of botany obliges us to look with unnecessary earnestness upon, and attach importance to, numerous minute points of structure, which, to the eye of a common observer, would appear trifling and insignificant. It has, however, long ago been remarked, that nature never appears more beautiful nor more wonderful than in the most minute of her works. Besides, the mind is not unfrequently disposed to look upon objects too superficially; regardless, and consequently unconscious of those more minute, though no less important, shades of difference which are daily presenting themselves, and which are immediately perceptible by the more searching and accurate observer. Hence the fact, (and I have no hesitation in stating it as a fact,) that the best botanists among the students of this Royal School of Medicine have usually been the most accurate observers of disease, and consequently have become the most judicious practitioners—

an assertion which I could readily verify by referring to numerous individuals, who, since my first connexion with this institution, have distinguished themselves as students in this branch of science, and who have subsequently become no less distinguished for accuracy of perception and soundness of judgment as practitioners in medicine and surgery. At the same time, I am willing to admit that the study of any other branch of natural history may produce in the mind the same beneficial results; and if I claim for botany any marked superiority, it is from its close and inseparable connexion with the practice of our profession. "The physiologist," says Dutrochet, "ought to study all organized bodies without exception; each of them will furnish some information; each of them will raise from before his eyes a portion of the veil with which nature covers her mysteries; for it is only by universality of research that we can become familiar with the phenomena of life."

These considerations furnish me with an additional argument in favour of the study of botany; in short, I will venture to say, that the student who cannot direct the powers of his mind to investigate the structure of a flower, to examine the texture of the wing of a butterfly, or to count the number of joints in the antennæ of a beetle, can scarcely be expected to take the trouble of making himself acquainted with the diagnostic symptoms of disease. He may acquire, I admit, a certain amount of general information; such information as he cannot fail to acquire, unless he shut his eyes to the constant succession of facts which will daily present themselves to his notice;—such a degree of information as he knows he *must* acquire, in order to escape an imputation of ignorance in his profession; but, gentlemen, depend upon it he will be a careless and superficial observer; he will not be likely to engage in any original investigations which shall be remarkable for clearness of perception and accuracy of discrimination; he will look upon ulcers merely as ulcers, without regarding the peculiar appearances by which one species may be distinguished from another, and his treatment of them will, of course, be regulated by crude and empirical notions, rather than by any clear and settled principles.

In confirmation of these views, I might mention, if it were necessary, very numerous instances, among deceased as well as living authors, who have been remarkable, in the early period of their lives, for their devotion to one or more branches of natural science. In the life and character of Dr. Bateman it is stated, that "from the very first, he distinguished himself, and took the lead in every branch of learning, to which he devoted himself with an ardour the most exemplary. Such, indeed, was his thirst for knowledge, that he joined sparingly in the active sports of his schoolfellows, although he exceedingly enjoyed them, especially cricket. He pursued his studies even in his hours of leisure, and almost his only relaxations were music, drawing, and botany. The lastmentioned subject was favourable to his health, as it induced him to take exercise. He ranged the whole country for many miles round in search of plants, and before he left school had completed an extensive *Hortus siccus*."

This talent for observation and investigation led him, after he had graduated, to take up the subject of cutaneous diseases, and to endeavour to distinguish them with more accuracy, and arrange them more methodically, than had been done by previous writers. How far he succeeded in his object, it is unnecessary to inquire; his "Practical Synopsis" and his beautiful "Delineations" will always speak for themselves. To the same talent for research we owe his "Reports on the Diseases of London, and the State of the Weather, from 1804 to 1816," as well as his "Succinct Account of the Contagious Fever of this Country."

The late Sir Everard Home may be mentioned as another illustrious example. That peculiar talent for accurate observation and minute investigation which induced that distinguished surgeon to examine the structure of the foot of the common house-fly, with a view to ascertain satisfactorily, and to explain philosophically, why that insect is enabled to walk with facility upon glass and other polished surfaces, even in a dependent position;—that same talent induced him to examine, with more than ordinary care, the various kinds of ulcer, and to distinguish and describe them as presenting different appearances, according to the peculiar condition of the parts, and consequently requiring different modes of treatment;—that same talent caused him to direct his attention to the structure of the urethra, to examine it both in its healthy and diseased conditions, and to inquire into the nature and cause of stricture;—that same talent prompted him to undertake an investigation of the structure and arrangement of the various organs in the lower animals, the result of which was the production of one of the most splendid works on comparative anatomy that has ever been published.

But it is unnecessary to dwell longer upon this subject; and I have only been induced to express myself thus strongly in the concluding lecture of this course, from an anxious wish to excite

in your minds that spirit of inquiry, and that steadiness of application, by the practice of which, as students, you cannot fail to derive the most important advantages; while, at the same time, you will be laying the foundation for that professional distinction in after life, to which you may reasonably, nay, confidently aspire, as intelligent and judicious practitioners, and which should be the aim and object of every medical student.

## FOREIGN DEPARTMENT.

### M. ROGER ON THE TEMPERATURE OF CHILDREN. (ARCHIVES GENERALES.)

In a valuable series of articles on the above subject, M. H. Roger has presented the results of many hundred cases, in which he has observed the temperature of children in health and disease. We shall only consider the essay as it relates to temperature in disease. M. Roger used a centigrade thermometer, and applied it always in the armpit of the children examined. At the time of birth the temperature was  $+37^{\circ}$  to  $38^{\circ}$ ; it lowered after some minutes, and then rose again to  $37^{\circ}$ . M. Roger divides diseases according to the degree of temperature, which is either higher, lower, or normal. The maximum was  $42\frac{1}{2}^{\circ}$  cent., the minimum,  $23\frac{1}{2}^{\circ}$ , thus fluctuating  $19^{\circ}$ ; whilst with persons of full growth the extremes vary only by  $7^{\circ}$ . A new-born child is suffering from fever when it shows more than  $38^{\circ}$ , whilst the pulse and the frequency of breathing do not indicate fever with the same exactness. The highest temperature was found in typhus, pneumonia, and meningitis. In the first, particularly, there is a very high temperature, with but little acceleration of the pulse. If, therefore, the thermometer shows  $40^{\circ}$ , or more, along with not more than 100 pulsations, then we may be sure that typhus exists, because in other diseases which could be confounded with it, the pulse would be much more frequent, whilst the thermometer does not show constantly so high a degree of temperature. The heat amounts in pneumonia to  $40^{\circ}$ , or more; in capillary bronchitis it is never more than  $38^{\circ}$ , and by this means pneumonia may be distinguished from the latter disease. In meningitis the temperature lowers usually in the middle period of the disease; so does the pulse and the breathing, but they rise again together, and remain in the same state as at the beginning of the attack. In very few diseases is there observed a decrease of the temperature under the physiological level. It occurs in paralysis, gangrene, cholera, in the shivering period of intermittent fever; in the latter disease only one case of lowering of the temperature was observed, and the decrease was but of  $\frac{1}{2}^{\circ}$  of a degree. In children, a general decrease of temperature occurs in œdema, or induration of the cellular tissue. Such a diminution has not been observed in persons of full growth, but only an unequal distribution of heat. If a child shows less than  $36^{\circ}$ , the manifestation of this disease may be apprehended, and when it has appeared, the temperature falls to  $32^{\circ}$ , or even to  $30^{\circ}$ , and less; the minimum was  $23\frac{1}{2}^{\circ}$  lower than with children who have been dead twelve hours. M. Roger endeavours to render his observations useful, not only in etiology and diagnosis, but also in the treatment of disease. Thus, according to M. Roger, it is evidently useful in typhus to keep the child cool, to use cold water, (in the form of cooling drinks, enemata, and baths,) &c. He even thinks the hydropathic treatment in this form of disease much more rational, and not less efficacious, than many other methods. We may ask, however, whether such a method of treatment is calculated to modify the cause of the disease? and that, future experience alone can decide.

The following final observation will not be without interest, particularly to those who consider intermittent fever to be a nervous disease. Gavarret found, as it is known, that in intermittent fever, even in the shivering period, the thermometer shows a rise of temperature of  $2^{\circ}$ , or even  $4^{\circ}$ , and that the temperature, in five cases, and in the period of the heat, was only one degree higher than in the shivering stage. This observation considerably strengthened the opinion of those who accounted for the febrile symptoms, and more especially for the shivering and heat, merely by an anomaly in the functions of the nerves of sensibility of the spinal marrow; and truly Gavarret's observations seemed to prove the sensation of great cold in intermittent fever to be merely a particular sensation of the nerves. It can scarcely be doubted but that such is most frequently the case, but it may be inquired, whether it is true that the thermometer never shows a fall of temperature, or rather whether the rise always takes place, and all over the body. Gavarret himself said, subsequently, that the higher temperature was only to be observed at the parts which are covered by the bed-clothes, whilst the other regions of the body become cooler—a fact which every one can verify by touching the ears or nose of such