









ADDRESSES

DELIVERED

ON VARIOUS PUBLIC OCCASIONS,

BY

JOHN D. GODMAN, M. D. ✓

Late Professor of Natural History to the Franklin Institute of Pennsylvania; — Professor of Anatomy and Physiology in Rutgers Medical College; — one of the Anatomical Professors to the National Academy of Design, N. Y.; Member of the American Philosophical Society; Correspondent of the Medico-Chirurgical Society of Berlin; Member of the Academy of Natural Sciences of Philadelphia, &c.

WITH AN APPENDIX,

CONTAINING

A BRIEF EXPLANATION

OF THE

INJURIOUS EFFECTS OF TIGHT LACING,

UPON THE

*Organs and Functions of Respiration, Circulation,
Digestion, &c.*

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EASTERN DISTRICT OF PENNSYLVANIA, to wit:

BE IT REMEMBERED, That on the third day of July, in the fifty-third year of the independence of the United States of America, A. D. 1829, JOHN D. GODMAN, M. D. of the said district, hath deposited in this office the title of a book, the right whereof he claims as author, in the words following, to wit:

“Addresses delivered on various Public Occasions, by John D. Godman, M. D. Late Professor of Natural History to the Franklin Institute of Pennsylvania; — Professor of Anatomy and Physiology in Rutgers Medical College; — one of the Anatomical Professors to the National Academy of Design, N. Y.; Member of the American Philosophical Society; Correspondent of the Medico-Chirurgical Society of Berlin; Member of the Academy of Natural Sciences of Philadelphia, &c. With an Appendix, containing a Brief Explanation of the Injurious Effects of Tight Lacing, upon the Organs and Functions of Respiration, Circulation, Digestion, &c.”

In conformity to the act of the Congress of the United States, entitled “An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned.”—And also to the act, entitled, “An act supplementary to an act, entitled, ‘An act for the encouragement of learning, by securing the copies of maps, charts, and books; to the authors and proprietors of such copies during the times therein mentioned,’ and extending the benefits thereof to the Arts of designing, engraving, and etching historical and other prints.”

D. CALDWELL,
Clerk of the Eastern District of Pennsylvania.

P R E F A C E .

“ Parlons maintenant de mon édition nouvelle. C’est la plus correcte qui ait encore paru : et non seulement je l’ai revue avec beaucoup de soin, mais j’y ai retouché de nouveau plusieurs endroits ; car je ne suis point de ces auteurs fuyant la peine, qui ne se croient plus obligés de rien raccommoder à leurs écrits dès qu’ils les ont une fois donnés au public. Ils alleguent, pour excuser leur paresse, qu’ils auroient peur, en les trop remaniant, de les affoiblir, et de leur ôter cet air libre et facile qui fait, disent ils, un des plus grands charmes du discours : mais leur excuse, à mon avis, est très mauvaise. Ce sont les ouvrages faits à la hâte, et, comme on dit, au courant de la plume qui sont ordinairement secs, durs et forcés. Un ouvrage ne doit point paroître trop travaillé, mais il ne sauroit être trop travaillé.”—BOILEAU.

MONITIONS

TO

STUDENTS OF MEDICINE.

THE arrival of the season in which we are to commence an arduous course of study, gives rise to a variety of interesting reflections, and one of the most pleasing is produced by witnessing the spirit and zeal evinced in your eagerness to seek instruction at every accessible source. Those who are to be engaged in teaching cannot perceive this, without anticipating much gratification from the performance of their duties, since the disposition to acquire, promises to be as active and energetic as the willingness to impart the advantages of experience and knowledge; and instead of looking with apprehension or indifference on our future labours, they are to be hailed with pleasure, as offering an ample reward of improvement and satisfaction both to the pupil and teacher.

With the intention and nature of Introductory Lectures you are, generally, well acquainted. They may be compared to the discussions of the state of the weather, which serve as an universal beginning to casual acquaintances, and may lead to other subjects of deeper interest, when there is assimilation of character or reciprocity of sentiment—without which the acquaintance will prove as fleeting as the clouds that provoked the conversation. Intro-

ductory Lectures may be considered as a hospitable welcome at the threshold, but can give us no idea of the nature or zest of the entertainment we are afterwards to receive. This is especially the case with those who profess to teach by *demonstration*, from no other notes than those furnished by the nature of their subjects. The qualifications of such teachers cannot be fairly judged from a written discourse, however discreetly pronounced, however fervid and elegant its diction; however correct and forcible it may be in expression. Such a discourse may appeal to the imagination, and give a new impulse to ever active fancy, or it may fix the attention on reflections of serious importance—but *demonstration* has a life and charm that addresses both the eye and ear, she calls on reason to examine and store up her relation of facts, and enables the judgment to deduce therefrom invaluable principles of thought and action.

Since our present discourse cannot be demonstrative, we shall take the liberty of addressing ourselves to those who are about to enter on the study of a difficult and honourable profession, in the hope of making our experience useful to them in pursuing the objects they have in view.

The importance and dignity of the medical profession have been felt and acknowledged in all ages and in every country, whether civilized or savage, because the severity of pain and dread of death have been coeval and co-extensive with the human race. Unfortunately for us, the perfection of our science is neither in proportion to its age nor to the revolutions it has undergone. Yet this liability to change both in doctrines and practice is rapidly diminishing, as the diffusion of knowledge is promoted and extended by a more correct study of nature. The charge

of being a conjectural art must at no distant period cease to be applicable, and the resources of our science know neither limit nor circumscription—if all who engage in its cultivation be properly zealous in their exertions, and true to the trusts they assume.

It is therefore all-important that we who are about to begin our professional career, should set out with correct ideas of the most advantageous course to be pursued in search of professional distinction, now that medicine is placed on a basis of the broadest and fairest character, and the value of medical talent is becoming more generally understood. To lose time by misdirected application, is an evil—but to acquire deep-rooted and injurious prejudices relative to our science is an almost irretrievable misfortune, of whose magnitude we can scarcely form an adequate idea.

The circumstances determining many of us to adopt a particular profession are seldom to be recollected. The choice is frequently the result of accident, sometimes of caprice, and occasionally of necessity. Hence, many of us set forth before we have had an opportunity of inquiring to what point our path is to lead—what difficulties may impede our progress, or what qualifications are necessary to our success. We are often fairly embarked, and return has become impossible, before we discover the true nature of our enterprize, and though we then see how slenderly we are appointed for so hazardous a voyage, we can do nothing but make the best of our situation. The accidental adoption of a profession would perhaps be of little disadvantage, could we be informed of the best course to pursue, or able to assume constancy and industry enough to surmount the difficulties that must present. Our know-

ledge often comes too late, except to convince us that much time has been lost and many efforts made in vain.

The science of medicine is vast, almost beyond the first conception of any man: it comprises almost all the branches of natural science directly or collaterally, and he who writes himself DOCTOR in medicine, tells us by implication, that he is at least possessed of the general principles of many sciences, each of which is individually comprehensive enough to require more than the lifetime of one man to grasp its particulars. If we confine ourselves to the departments strictly called medical, we shall find even in them, an amount of knowledge collected which we dare not hope to appropriate to ourselves. Anatomy, Surgery, Therapeutics, Obstetrics, Chemistry, &c. excite in our minds ideas of long-continued and severe study, even for obtaining their elements, and we see venerated teachers growing old in the study of a single branch, without ever imagining or pretending that they have explored the whole of the field they have so ardently and assiduously cultivated. These circumstances are neither mentioned to inspire dread nor deter from exertion, but to place in stronger light the necessity there is that you should be thoroughly aware of what you are pledged to attempt and perform, and to incite you to advance, by advising you of the means that will most conduce to your success.

We will commence by inquiring what it is you are expected to accomplish during the period of your noviciate; what circumstances are necessary to full and lasting success. The great object of your preparatory studies is to acquire a sufficient stock of knowledge to make it safe that you should be allowed to study in the great school of ex-

perience. In other words, that you should gain such an acquaintance with the facts and principles on which your art is founded, as will justify the proper tribunals in placing your names on the roll of those who may without injury to society become responsible for the lives and happiness of our fellow creatures. This is all you can do as mere students—it is all that is asked of you—and that it is not always performed, is often owing to a want of a proper acquaintance with the nature of the task to be accomplished. The study of medicine should be regarded as a selection and examination of facts, with a view to the deduction of general principles of action—not as an effort to accumulate materials for the mere purpose of aggregation. To know that the pulse is produced by the contractions of the heart—that the arteries are the vessels in which pulsations occur, and that these vessels are always to be found in a certain situation, would be of slight importance, did it not furnish us with means of deciding in many difficult cases on the most efficacious treatment—and frequently enable us to disappoint inexorable death of his prey, when accident has invited his approach.

The first great mistake of the medical student usually follows his eagerness to grasp all the particulars of knowledge properly pertaining to his profession. He begins by loading his memory with details, instead of improving his judgment to examine the value and bearings of the general rules proper to each section, or common to the whole. His exclusive attention to a particular segment of the circle is not felt to be incorrect until a considerable advance is made, and a fondness acquired for a special department, in which alone, the material still seems inexhaustible, and the space to be traversed boundless, though many other

equally important branches are to be studied. A violent and hurried effort is then made to effect what patience and steadiness alone can accomplish, and the most common consequence is, that the memory is exclusively relied on, without reference to any other end than the performance of a task. It thus often happens, that he who properly directed, would have looked forward to the honours of his profession, as a reward merited by his application, too often receives them in uncertainty and dread, for correct answers to questions that may prove nothing but the strength of his memory, and be forgotten long before their importance is felt or understood. Were every student well informed of the exact character of the acquisitions he is to make during his noviciate, the condition would be very different from that just referred to. To learn *all* that is known in *all* the branches of medical education is impossible in the very nature of things, but to become acquainted with their elements or outlines is in every man's power. This is the knowledge you are to gain—not the ability to answer every question that may or can be asked, and the man who has applied himself to the study of the leading facts of each department, and learned to deduce from them the rules by which his professional conduct should be governed, is able to show that he is qualified to perform all the duties pertaining to his profession. In honouring such a man with a degree, a benefit is conferred on the science and on his country.

It would be a great happiness to us, could we prevent you from falling into a common error relative to the chief objects for which a student of medicine is to strive. If we were to ask what is his great aim, many would reply, the attainment of his Degree. Now, though the degree has its

specific value, it is as an evidence of previous industry—and actual acquirements—not as having any intrinsic worth, separately considered. The possession of a degree does not impart talent—nor does it prove that the possessor has talent—nor is more than ordinary intelligence indispensable to the attainment of this honour in any institution, throughout the world. Correct deportment—an observance of the proper forms, and a certain diligent attention, will insure a degree to the plainest and most middling genius. Proofs of this are at all times before your eyes—and should convince you that the terrors of examination can only be such, to those who have misspent their time or misapplied their industry.

A degree merely, *is not*, and should not be, the chief good of a student who comes to a great institution in a large city. His efforts should be strenuously made to gain knowledge, to fill his mind with the treasures placed within his reach, and exert his industry in the way that will best fit him for the discharge of the high and responsible duties of his profession. The opportunities presented to you at this period of your lives, can rarely, if ever, be enjoyed a second time. When about to begin the practice of medicine, most of you must remove to distant situations, where there are few books to consult, and still fewer professional friends. Little will it avail either in relieving your patients or consoling you for loss of reputation produced by neglect of opportunities, to be able to say you have procured a degree. But if the student acts under a proper conviction of his duties, and determines to use the ample opportunities spread within his reach, the degree follows as a *matter of course*—and is proffered to him with as much readiness as he can have to receive it; and with

this enhancement of value—it is then a substance, not a form—an honour deserved, not inherited—a testimonial of high character, and not an empty title. Such a degree confers as much honour on the givers, as it does on those who receive it—and the success of such graduates is regarded by public institutions with the same pleasure that a parent looks on a favourite child, whose generous emulation and noble deeds promise to give lustre to all who have been concerned in the development of his character.

One admirable advantage you would gain from a correct appreciation of the objects that ought to command your efforts, and the reward you should propose to yourselves, would be, the removal of those perturbing anxieties that arise when the period of examination approaches. We pretend not to say it would banish all solicitude—for that feeling is inseparable from modest and ingenuous youth in such a situation; but it would extinguish fear and eternally silence the suggestions that are sometimes made of the possibility of partiality in our medical tribunals; of personal feelings being allowed to influence their decisions—or of private passion being allowed to produce public injustice. A moment's reflection will be sufficient to prevent you from listening to insinuations so degrading to the mind capable of believing them. It is impossible that men, selected solemnly to decide on the fitness of candidates for a distinguished and honourable office, should permit themselves to be influenced by any other considerations than those of duty and justice. That men thus responsible, should allow pique, anger, or any other ignoble motive, to blast the reputation of one who is just entering on the theatre of life is a supposition too monstrous ever to have been credible, notwithstanding the frequency with

which it may have been imagined. But were such a thing *possible*, the general sentiment of public indignation would whelm the perpetrators beneath a world of obloquy which the strength of Atlas could not sustain—nor the hundred arms of Briareus repel.

Those who are obliged to decide on the acceptance or rejection of candidates, are men who have trodden the same arduous path—have felt all the anxieties you now feel, and endured the same toils that you are now to undergo. They well know how eagerly the hopes and wishes of friends centre in the candidates, and how deep a wound they must inflict when they declare any one unworthy of the honour to which he aspires. They must unfeignedly rejoice in the success of those who are accepted, and deeply regret the rejection of such as are unqualified. This rejection can only follow their most dispassionate and deliberate conviction of the unfitness of the applicant. Join with us then in treating all such suggestions as the offspring of ignorance or ignobleness, and be deaf to every whisper that would imply unworthiness or degradation in those we are inclined to honour for their talents and high standing; whom we venerate for their justice and integrity; and love for their moral and social worth.

The solicitude felt by those who have been most industrious and attentive to their studies, is not without its salutary influence on the candidates themselves and on those who are in future to become so. It gives the strongest testimony of the high character of the tribunal and of the elevated standard they have fixed as the test of the candidate's fitness. There is no aberration from truth in saying that the qualifications requisite to obtain admission to share the honours of the profession here, would secure the same

honours from any institution in the world. Here, the examination does not mean the observance of forms, nor is it necessary for the learner to waste his time in acquiring the facility of talking [*canine*] Latin in order to answer questions that he best understands in his own tongue. The only proofs he has to give, are, that he has correctly acquired the elements of his art, and is fit to be dismissed to his friends and the world to take charge of the health and lives of his fellow creatures.

The oldest and most celebrated schools in the western world, derive a great part of their deservedly high reputation from the value they set on essentials, and the neglect of mere forms. Strength of mind and useful acquirements have ever been valued above mere ornament or abstruse trifling, and in consequence very many of those who have been ushered into the profession under their auspices, have done honour to themselves and benefited society. It is not possible to believe that any of you could wish that the standard of professional excellence should be lowered, or that the gates of the profession should be thrown open to any but those who have exhibited the best evidences of their courage and zeal, by their perseverance in ascending that proud eminence on which these portals are erected. You would reflect with sorrow on any change in this respect, and should rather rejoice that the requisites were increased, than hope they will be diminished.

It is incumbent on you to make the best use of the opportunities afforded by your visit to this city, for many excellent reasons. The respectability and rank of the students of medicine increase with the increase of their respect for themselves, and in proportion to their vigorous

application to the business of their studies. Instead of being considered as thoughtless youths, more eager after pleasure than improvement, they are now regarded as serious and laudable young men, desirous of qualifying themselves for usefulness in life, and many of them destined to occupy a conspicuous place in the history of our country. In all parts of the Union we find literary, scientific, and philanthropic institutions founded and continued by members of our profession, and your friends will hope to see the same spirit actuate your conduct. In addition to what is to be expected of you on ordinary occasions, your country must look to you for still higher and more arduous duties—you may be asked to bind up the wounds of those who are injured in her service; on you may fall the care of hundreds, who, far from home and friends, have been maimed and disabled, and all their hopes of earthly aid will rest on you. If you make yourselves the men you ought to be, by rightly using your opportunities, your presence will be looked for as eagerly as the light of the blessed sun, and the dying soldier or sailor, who has no parent, wife nor child to close his eyes, will heave his last breath in blessings for the soothing and consoling attentions of such a friend.

But that you should be distinguished, or experience the delight of ministering largely to the happiness of your fellow men, you must begin by laying the most solid foundation, and acquire the knowledge that is to enable you to do honour to your profession, as well as to secure the ornamental additions which will give grace and ease to your manners and conversation. In becoming Students of Medicine you have placed yourselves in a condition of much responsibility, and are pledged to make the most

persevering exertions—to display all possible talent, and strive for a distinguished reputation. If you redeem this pledge you will hasten that era when the title of Student of Medicine will be equally expressive of honourable ambition, elevated feelings, and high moral worth. In this city you cannot want for examples, of what may be attained by a proper exercise of professional talents. *This* has been the field of RUSH's greatness and of WISTAR's excellence—both as much beloved as honoured—both rising from their determination to improve themselves and benefit their fellow creatures, not only by their speculative doctrines, but by their eloquent and admirable examples. These, and a bright band of kindred worthies have ennobled our profession and enriched humanity, and the mantle dropped in their heavenward flight has been caught and nobly worn, by that universally venerated pupil of the justly renowned HUNTER, from whose lips it is our happiness still to receive instruction, and whose renown in ages to come may prove a high incentive to emulation in the bosom of every student of our science.

Having endeavoured to point out the objects you should have in view—the course to be adopted, and the examples for imitation—let me take the liberty of offering a caution that may save you many unavailing regrets.—We set out in pursuit of professional distinction when the buoyancy of youth and the vigour of imagination lift us over every impediment and break down every barrier. Hope tints the distance with the most glowing and flattering colours, and the mind revels in delightful anticipations of pleasure, fortune, and renown. A moderate experience in the cold realities of life, proves that we have been dreaming, and teaches that if these good things are ever to be realized,

it is only when years of patient endurance have elapsed, and after the fires of youth have been well nigh expended in the service of our fellow creatures. Accident may sometimes realize the expectations of youth, but the most universal rule is, that wealth and fame from professional exertion is the slow though sure reward of long labour and persevering industry. This circumstance is of the greatest advantage to society and to our profession, but those who have yielded too much to the dominion of hope and fancy, are frequently so much affected by discovering the truth, as to suffer an entire revulsion of feeling, and sink from the most brilliant flights of imagination, to the lowest depths of despair. This despondence is permitted sometimes to prey on the mind until it produces neglect of business or harsh misanthropy, and the unfortunate sufferer is continually tortured with notions of the ingratitude of mankind—the neglect of merit—the low state of professional character—while he is letting slip the best opportunities to convince himself of the contrary, by efficiently performing those duties his profession enjoins and society requires. Be then prepared to discover that the world yields neither wealth nor distinction except as the price of industry and great deservings. Stop not to consider whether men are ungrateful or merit is neglected—but perform the actions that create a claim to their gratitude—declare your merits by the faithful discharge of your duties—and then you will find such complaint impossible.

If such were not to be the result, policy would dictate the propriety of concealing our mortification. The voice of repining and discontent is ever painful and offensive to others—and the same persons, who warmly sympathize with a noble spirit struggling against misfortune, and, though broken-hearted, looking calmly on the approach

of inevitable fate, despise the creature who is continually vexing their ears with fruitless and peevish complaints, or venting selfish ejaculations against the characters of those who have lived beneath a brighter sky, or been wafted along by more propitious gales.

Of this you may feel perfectly assured, that really meritorious conduct cannot go altogether unrewarded—neither can the fire of true genius be entirely smothered. The time must come when perseverance in the conscientious discharge of high duties, will secure the remuneration and respect it is entitled to; the mind that has been wrought up by the study of proper objects, and is sustained by a determined enthusiasm to effect great purposes, may for a time be weighed down by poverty or misfortune—but like the giant of ancient fable, its struggles will convulse the superincumbent mass, and must eventually shake off every hindrance to perfect success.

If in offering these considerations to you on the present occasion, we appear diverging too far from the beaten track, we trust you will pardon the zeal that urges the laying before you, what reason and experience induce us to hope may be to your advantage. Being exclusively devoted to the service of those who are engaged in the study of medicine, we may be allowed in some degree to identify our feelings with theirs, and be anxious to spare them suffering, not less than to aid in insuring their success. Whatever defect there may be in manner, there is none in feeling; nor is there the slightest departure from fact in stating—

“For you, ye *studious*, I strive,
For you, I tame my youth to philosophic cares,
And grow still paler o’er the midnight lamp.”

November, 1824.

ANATOMY

TAUGHT BY ANALYSIS.

“Si quis me redarguere potest et demonstrare quod non recte sentiam aut agam, læto animo sententiam mutabo; VERITATEM enim quæro quæ nemini unquam damno fuit. Ego quod est mei officii ago, cætera non me avellunt.”—*Marcus Antoninus.*

THE History of Medicine anterior to the time of HIPPOCRATES is lost in the obscurity of fable, though we must believe with CELSUS, that in all ages it existed in some form, however rude and insufficient this may have been.* Notwithstanding the high degree of improvement to which our science was brought by the Coan Sage and his disciples, its progress towards perfection has been exceedingly slow, and almost universally impeded by an evil of the first magnitude—the disposition to speculate upon slight and insufficient data, to the neglect of accurate and patient observation. By this the most ardent and enthusiastic inquirers after truth have been allured from the right way, and following the brilliant creations of their own fancies, until the realities of fact have ceased to charm, or to excite even a temporary interest, eventually, those who might have extended the boundaries of knowledge and augmented the usefulness of our science, have expended their best efforts in endeavouring to subject all nature to their own preconceptions. Hence ensued the innumerable hosts of theories and systems, which so long attracted the admira-

* “Hæc [Medicina] nusquam quidem non est.”

tion and wasted the time of students of medicine; many of these theories consecrated by the force of talent which gave them birth, rest quietly beneath splendid monuments which their founders erected to their memory; a far larger number of humbler fortune, have sunk into well merited oblivion, or occasionally flit around their former abodes, the melancholy memorials of time misspent and industry unavailingly exercised.

To a student of medicine, glowing with the ardour of youth, and feeling for the profession he has adopted all the enthusiasm of a first love, this disposition to speculate upon a slender capital of knowledge, is accompanied by serious inconveniences, and followed by lasting injuries. Too frequently the acquisitions made merely by reading for a few months, are permitted to inspire him with vain notions of accounting for the most mysterious processes; the observation of a few insulated facts fill his mind with the hope of building up a system which shall brave the shocks of time and accident—while from a superficial examination of instruments of surgery, he is induced to believe that his ingenuity can supply all their deficiencies or add perfection to every excellence. When an individual allows this disposition to sway his mind, study soon grows drudgery, and patient observation becomes distasteful and irksome: the indulged imagination roves to new excesses, and when the period of study is ended, and the physician should go forth prepared to render assistance to his fellow creatures, by having learned the true conditions of the organs, actions and laws necessary to health, he enters a world of his own creation; sees what he has been accustomed to imagine, and exerts himself to avert evils which have existence solely in his own brain. Before he awakes from this dream-

ing condition, his sober companions, who have been content to learn the facts connected with their profession, and deduced their principles of action from knowledge gained of the operations of nature, outstrip him in the career of professional usefulness and distinction, win the admiration and respect of society, and enjoy the fruits of their well-merited success, while our speculatist is lamenting that his talents are neglected—his efforts unavailing—and his fertility of invention thrown away upon a stupid and indiscriminating world.

Allow, however, that this is a heightened picture, and the extreme of an injurious mode of acting—let us ask ourselves whether we do not often experience that impatience which urges us to generalize from slight reading or a small collection of facts? Whether we do not jump to conclusions without examining the ground with sufficient accuracy? Whether we are not more willing to adopt a labour-saving doctrine than be at the trouble of carefully examining how far it is supported by fact? Should we discover that we are subject to feelings of this sort, we have need to be on our guard: we must form a good resolution into a steady habit of action, in opposition to this unphilosophical spirit, and tie our attention down to the investigation of useful facts, however seemingly dry and uninteresting, until imagination is brought into subservience to reason, and its excursive vigour is so far restrained as to lighten our task without turning us from our proper course.

The truant disposition of which we have been speaking, has impeded the study of our department not less than that of the science in general. Centuries elapsed between the earlier steps of its improvement, and from age to age

we perceive it handed down in the condition it was left in by GALEN, under the shadow of whose ponderous volumes it was dimly seen and incorrectly portrayed. It seemed as if the very dust which time had deposited on his pages, was too sacred to be lightly removed; and the hardy investigator who ventured to doubt his inspiration and veracity, was marked as profane, or shunned as if accursed. One person was at length found, whose eager and energetic mind was not to be satisfied with any thing short of the truth; who disdained to pin his faith on the mere assertions of others; who appealed from books to facts, from men to things, from dogmatism to nature. VESALIUS of Brussels was the man who did this, and who merits the grateful remembrance of every student of Anatomy. He, by his knife, detected and exposed the rash conclusions and fallacies of Galen; awakened the sleeping spirit of inquiry, and breathed a new life into the bosoms of those who studied Anatomy.

But we are not surprised to learn, that the first changes made in our science were far distant from perfection. For very many years after the time of Vesalius, anatomy remained in a state of comparative rudeness and barbarism, presenting occasional gleams of light, which were soon lost in the general surrounding darkness. As the temple of anatomy was only to be entered by the sepulchral gate, near which superstition long watched with trembling, though terrific mien, her train of "dark imaginings," assisted in keeping inquisitive scrutiny aloof, until by the diffusion of intellectual light these phantoms were put to flight. Then the study of anatomy rose very rapidly in estimation, her votaries became numerous, and their researches of real utility, as they relinquished the vain dis-

putations of (falsely called) philosophers, to seek for truth in the realities of nature.

The true mode of study being once fairly adopted, the study of facts and not of opinions, the celerity of improvement exceeded the most ardent anticipation, and the veil interposed by prejudice and scholastic dogmatism was forever withdrawn. A new and steady light was substituted for the feeble and flickering glare of conjecture—a new impulse was given to all departments of science, and medicine underwent a regeneration, from which the most gratifying hopes may be formed of her future beneficial influence.

But, as the science of medicine, is a collective term for a great number of sciences, with which the physician must to a certain extent be acquainted, our hopes of the future, cannot be followed by fruition, unless you, who are to be the agents in producing the desirable consequences, are thoroughly resolved to undertake the work in proper spirit, and contribute each his part, to the consummation so devoutly to be wished. We wish you to cherish your enthusiasm, as a precious endowment without which nothing good or great can be effected; but would also persuade you to secure its endurance, by engaging in the pursuit of professional excellence with a thorough persuasion that your labour is to be immense—your privations many—the obstacles of great magnitude, and the necessity for exertion uninterrupted: but comfort yourselves at the same time by the recollection that your reward is exceedingly great, if you persist to the end. Should you ask what reward can be adequate to a life of so much exertion; what recompense can be offered for such toils—what remuneration can be given for all that must be relinquished? I bid you to re-

member the names of HIPPOCRATES, of SYDENHAM, of BOERHAAVE, HARVEY, HALLER, JENNER, HUNTER, RUSH, and the sacred few, who like them have heaped benefits on mankind by their professional labours; whose names are associated throughout the world with honour and blessing by all capable of estimating the value of knowledge and loving their fellow creatures: look at their imperishable renown, which, towering with indestructible grandeur above the wreck of empires and nations, will survive as long as mankind are susceptible of generosity and gratitude—and answer these questions for yourselves!!

It is true that to some studies the mind is invited by the beauty of the objects, and its ardour kept alive by the rapid progress which is made; there are others to which the way is less delightful and the interest excited is neither so intense nor inspiring, although nothing is presented to repulse or offend; but anatomy has not an inviting aspect, nor are its concomitants suited to stimulate the inquisitive to labour nor to rouse the indolent or indifferent to enthusiasm. The first approach to this science is generally made amidst the gloom of prejudice and the confusion of ignorance; the first glance at it, is most commonly that of aversion, and the first attempts to acquire its elements *practically*, are almost uniformly made in disgust. To these impediments may be added numerous factitious difficulties flowing from various sources, among which, the want of a proper conviction of the true value and universal application of anatomy to medicine, the inaccuracy and inappropriateness of many books first placed in the hands of students, and the dangers to which they are in many places exposed, by venturing to appeal from books to the knife, may be enumerated as of the greatest magnitude.

When we consider all such circumstances, together with the actual extent of the subject, and the vast number of facts which are to be remembered, it will not appear surprising that comparatively so few grow fond of the study, and those who become perfectly acquainted with its details extremely rare. Neither shall we be surprised that many persons content themselves with alleging these difficulties as a cause of their want of ardour, or that they remain satisfied with a superficial knowledge of the subject rather than make the necessary exertion to become profound. In fact, he who would study anatomy properly, should be endowed with no ordinary share of resolution, should be thoroughly convinced of the importance and necessity of making his best efforts, and have an enlightened view of all the benefits anatomy is capable of conferring on the subsequent steps of his professional career. His progress must be slow, in order to be sure, for although he may be gifted with the brightest talents, and grasp at the treasures of science with a hand of power, yet without untiring and enduring perseverance, he cannot anticipate an ultimate triumph over the obstacles to his success.

Let us consider the importance of anatomy to the practitioner of medicine. He who is unacquainted with the structure and function of the healthy organs, must be, of necessity, inadequate to judge correctly of the causes and seats of disease. He will be continually forming incorrect and injudicious opinions, which lead at once to injurious or destructive practice. He is perpetually exposed to suffering or alarm, from symptoms and appearances which a knowledge of anatomy would at once make clear and intelligible. His conduct must always be marked by

the worst of indecision, that springing from ignorance, while his reputation, ever left to the sport of accident, is continually in danger of being destroyed. In his daily business, he is without guiding principles, and destitute of support; he suffers all those vexations which result from a habit of ill-directed and desultory experiment. It is beyond contradiction, that such results must ensue, when men enter on the practice of our profession without having first learned the construction of the body on which they are to exercise their skill. It is a superficial and an untenable notion, that anatomy need be known THOROUGHLY, only by the surgeon. There is no department of medicine which does not lean on it unremittingly for support. What are your drugs and medicines, without a knowledge of the parts to which they are to be applied? How can you know the manner in which the organs act on these substances, without knowing how the organs are constituted? In what way is a physician to frame his opinion on the cause or consequences of disease, without a knowledge of healthy actions? which cannot be understood, if the structure and relation of parts be not first investigated.

As anatomy teaches us the structure and connexions of the parts composing our bodies, one of the immediate consequences of studying it is the acquisition of some ideas relative to the functions they perform. The anatomist imperceptibly becomes a physiologist even when most busied in examining the details of construction, and when he subsequently enters on the special study of the functions, speedily acquires clear and precise notions of the actions of individual parts; of their relations to the whole system; and of the reciprocal influence of parts on the whole. Careful induction and experiment teach him to trace out

the laws which make health and life dependent on the uninterrupted succession of certain actions; and as the light of anatomy is shed upon the more minute parts of the system, his views increase in comprehensiveness, he looks upon his profession with a higher feeling of respect, and a fuller glow of hope for its improvement and usefulness.

Having acquired a well grounded knowledge of natural or healthy functions, the student no longer finds it difficult to comprehend how various diseased conditions may be produced, and is able to detect the earliest aberrations from health by symptoms imperceptible to such as are not acquainted with structure and functions. He is also prepared to foresee results which must ensue from a continuance of such disarray, as well as to distinguish between secondary and original symptoms: thus while one less thoroughly imbued with the requisite knowledge would be treating a patient for consequences, he would more efficiently apply his powers to the removal of the causes whence they sprung. This power of discrimination may be perfected to a very high degree, and almost in the direct ratio of our acquaintance with the structure and functions of the various organs in the body.

It is an unfortunate notion that a student may devote too much time to anatomy; because, after he enters into business he can rarely or never enjoy the opportunity of renewing his anatomical researches; and he is continually liable to be called on to treat diseases or injuries, which, to be properly understood and judiciously managed, will require his clearest recollection of the minutest points in anatomy. It is on occasions which baffle the ignorant and confound those who have been negligent, that the value of your anatomical labours will become apparent, and pub-

lic approbation will manifest a vast difference between the esteem bestowed on him who has not spent his youth in vain, and that, shown to one who has been content with forms and observances, instead of striving to acquire knowledge. Under all circumstances, the practitioner who bears his anatomical and physiological knowledge constantly in mind, has in the most difficult situations a chart by which to steer, and is acquainted with resources upon which he can rely; while one destitute of this assistance is tossed upon a sea of doubt, is entirely at the mercy of accident, can make but random efforts to extricate himself from danger, and knows not the point towards which he is hastening.

Surgery in all its various subdivisions, may be said to have no existence independent of anatomy, being constantly engaged in the preservation of the natural conditions of the body, either by mitigating the effects of injury, replacing what has been broken or disjointed, or in removing what has become noxious. The usefulness and excellence of the surgeon is in immediate proportion to his familiarity with all the details of organization, with all the minute and curious relations of parts. To discharge his professional duties to advantage, and do proper honour to himself and his profession, nothing in anatomy which is attainable should be unknown to him—nothing should be unexplored by him that can possibly shed light on the changes which disease may produce, or on the nature of morbid conditions which enlightened dexterity might relieve.

If we examine what surgeons have been distinguished as public benefactors in all ages and countries from the time of the immortal VESALIUS to the present hour, we shall find that they have been those who were most pro-

foundly acquainted with anatomy and physiology, and who have most assiduously and practically devoted themselves to their cultivation. It is true that empirics have at different times, gained celebrity by the performance of certain operations, but we must recollect how many persons must have perished under their hands before their skill was obtained; and how little they were guided by any principle in the course they pursued. That anatomical knowledge alone, constitutes its possessor a surgeon, is what we do not pretend to advance; but without it a *surgeon** cannot exist, for the term to be correctly applied,

* In a note to the translation of Coster's Manual of Surgical Operations, we have attempted to point out the true character of a "SURGEON," and take the liberty of introducing it here for the benefit of those who have not the work above mentioned.

"The difference between a surgeon and a mere operator, may be more thoroughly appreciated by contrasting them:—the *surgeon* inquires into the causes and removes the consequences of constitutional or local disease—the *operator* inquires into the willingness of his patient to submit, and resorts to the knife. The *surgeon* relies on the restoration of the healthy actions by regimen and medicine—the *operator* relies on himself, and cuts off the diseased part. The *surgeon*, reflecting on the comfort and feelings of his patient, uniformly endeavours to save him from pain and deformity—the *operator* considers his own immediate advantage, and the notoriety he may acquire, regardless of all other considerations. The *surgeon* reluctantly decides on the employment of instruments—the *operator* delays no longer than to give his knife a keen edge. The *surgeon* is governed by the principles of medicine—the *operator*, most generally, by the principle of interest: one is distinguished by the numbers he has saved from mutilation and restored to usefulness—the other by the number of cripples he has successfully made. The *surgeon* is an honour to his profession and a benefactor to his fellow creatures—the *mere operator* renders the profession odious, and is one of the greatest curses to which mankind, among their manifold miseries, are exposed."

can only be given to those who, to a proper degree of collateral information, have added a thorough and practical knowledge of the construction, relations, and functions of the organs composing the human frame. To be a surgeon without a knowledge of anatomy, is as impossible as that a blind man should be a painter; to such a person all colours would be darkness—to such a surgeon every variety of texture would be but one confusion.

If we consider every branch of medical education and practice in detail, we shall discover that each has a more or less immediate reliance on anatomy and physiology, and that all the best established principles of medicine are founded upon the knowledge of structure and function. Anatomy is the only department which may be strictly declared to have an independent existence, inasmuch as Physiology, Pathology, Therapeutics, and Surgery exist only in immediate reference to it; and the sciences of *Materia Medica* and Chemistry pertain to medicine, only so long as they refer to the other branches which presuppose an acquaintance with anatomy.

No incentive to exertion can be wanting after you have seen and felt how intimately and inseparably connected our science is, with all that is rational and useful in medicine. Without it physiology cannot exist—pathology cannot be studied—practice would be reduced to random experiment—and surgery degraded from the high rank it now holds. Without the torch of anatomy to direct his movements, the efforts of the accoucheur would be in vain, on those occasions where his judicious interference is attended with life and safety to the mother and her tender offspring. Without a knowledge of anatomy and physiology in vain might the chemist follow nature through her

mysterious combinations, to discover agents of greater potency and usefulness than those already employed: in vain might the student of materia medica cull the drugs of distant climes, or explore the boundless regions of our own land for medicinal substances.

Such then being the importance of anatomy, and its absolute necessity to the formation of a good physician, it may excite surprise that any votary of medicine should neglect opportunities of procuring that knowledge, which is the grand axis his profession revolves upon, and to which continual reference must be made in the performance of the most ordinary professional duties. The importance of anatomy is often assented to with readiness, but it is too frequently not properly felt until the individual is placed in situations where all his deficiencies stare him in the face, and his mind is agonized by recollections of valuable opportunities irretrievably lost. A greater misfortune can scarcely be imagined than to witness operations performed by those who have no better knowledge of anatomy than is supplied by their indistinct recollections of demonstrations imperfectly attended to, or the anatomical details given in descriptions of surgical operations. This mode of studying anatomy *on the living* subject, is unfortunately not so rare as it should be, though the evil is daily decreasing: your presence at this season, is the most satisfactory guaranty that it soon must entirely cease to exist.

Independent of the utility of this science, the wonders of animal organization afford a vast extent of intellectual gratification; the most splendid exertions of human ingenuity fade to insignificance, when contrasted with the wondrous contexture of the human frame, where the

simplest of tissues far surpasses the most boasted exertions of mechanical ingenuity; the instruments being not only perfect in their kind, but endowed with a power, self-sustaining, self-acting, and self-continuing. He who examines the body but slightly, sees much to admire in the adaptation of parts, and combination of the whole: he may remark, that the organs of sense are so arranged as to bind men together by a community of desires and expressions—may see that strength is combined with mobility, energy with elegance, grace with motion, and beauty with repose. He may observe how the mind imparts to the countenance all the varieties of expression, indicative of its emotions—but he cannot so fully appreciate even these circumstances; cannot so truly feel the excellent perfection of design, the unerring correctness of operation, the beauty and harmonious accord which pervade every instrument and function of our systems, as the man who has possessed himself of the principles by which he should judge, and learnt enough to teach him how to admire.

In the organs of sense we find every thing that is wonderful in design, and admirable in execution; we behold Omnipotence in every product, and Omniscience in every plan. We see system within system, organ within organ, each differing from the other; performing different offices; all tending to the perfection of a common function; which *itself* is but a small part, contributed to the perfection of the whole. Take for example the eye, that organ which seems to live only when influenced by the mind. Let it be seen under the impulse of exalting passion, or debasing propensity; when it sparkles with exuberance of joy, or rolls in the lustrous languishment of love; when it beams the intensity of devotion, or flashes forth the electric light

of genius: or behold it when anger, hate, or fierce revenge, shed their lurid influence over the soul—how wonderful are the changes, how endless the variations of expression. Yet the wonders of its organization exceed even the number and beauty of these. The texture of its coverings, the delicacy of its fluids, the tenuity of its nerves and vessels, are individually objects of astonishment when examined. The observer finds that it is not only a perfect instrument for receiving the rays of light, but that it is furnished with a beautiful apparatus for directing its surface to every point, and is endowed with various other organs to moderate the intensity of light, and preserve its surface from injury. It is no longer a single instrument, but a combination of the most admirable organs; each perfect in its kind, each independent of the other, yet the co-operation of the whole absolutely essential to the least of its expressions.

To bring these truths nearer to your minds, let us glance at the relations which subsist between the different parts of our body. We every where observe, that the nerves and blood-vessels are the great agents of sensation, nutrition, and life. Yet these have no independent existence; they are themselves supplied with nerves, blood-vessels, and absorbents. Here, we are at once carried to the utmost limits of our comprehension, for in what an infinitely diminished series may not the nerves and blood-vessels exist, when they go to supply the vessels of vessels, and the nerves of nerves! Observe the manner in which the due balance of actions is maintained in our bodies; one set of vessels absorbs and another deposits; one set accumulates and another removes. When this equilibrium is destroyed disease ensues, and, if it be not restored, death must suc-

ceed. "What a piece of work is man! How noble in reason! How infinite in faculties! In form and moving, how express and admirable! In action, how like an angel! In apprehension, how like a God!"

The importance and general utility of anatomical knowledge are generally admitted; but it may possibly be urged that the difficulties to be encountered in its acquisition are of a magnitude commensurate with its usefulness. To say that there are not some serious obstacles in the way of the most devoted student would be incorrect; yet it is a fact, that the worst of these obstructions may be surmounted by those who have courage and perseverance enough to make the attempt. There is however no "royal road" to anatomy—no short route by which her treasures may be attained. But when you commence the study of our science with a proper conviction of its value, aided by an experienced friend to direct your application, you will be delighted to find that most of the difficulties are artificial. You will perceive order and beauty where you may have expected irregularity and confusion; each day's practice will render the succeeding more easy; and when you look back, you may smile to discover how unnecessarily fears have been excited. In examining the structures of various parts, and their relation to the general mass, the important functions they discharge in the healthy body, and their affections in a state of disease, you will forget the jargon in which you may have seen them enveloped in books, and wonder that men could so relinquish the substance, to grasp at an illusive shadow. After the elements of this study have been acquired, and by a little patience the difficulties attached to every new pursuit mastered, you will feel as if in a new world—every part explored will bring

to mind the importance of some medical precept, or establish in the mind the correctness of some surgical practice. You will be enabled to extend your researches relative to the operation of remedies, to scrutinize the validity of the doctrines taught you, and go out into the world prepared for all the incidents which may befall you in your career for professional usefulness or fame.

Various methods have been devised to render the path which must be trodden less rugged, and to aid the progress of the traveller by affording him every facility for understanding the nature of the country through which he must pass. Among others the individual who now has the honour of addressing you, has made an effort with a similar view. As you are unacquainted with the true character of this method, we beg leave to lay before you such a description of it, as will enable you to form an opinion as to its possible advantages, and compare it with the mode of teaching commonly employed. In order that you may judge of it to greater advantage we will refer to the ordinary method, succinctly and fairly, previous to entering upon an explanation of our own.

The only safe mode of reasoning is that which leads us back, from particular observations to general conclusions. When we wish to understand any substance in nature, we must first reduce it to simple elements, in order to gain a proper acquaintance with the result of their combination, or the mass. This mode of examination is called analysis, or decomposition. If we recombine the elements in order to reproduce the mass, the process is called synthesis, or composition. It must be clearly perceived, that the latter method can only be resorted to with advantage, after the analysis has been made with the most perfect correctness.

The mode in which anatomy is ordinarily taught is by *SYNTHESIS*, or *COMPOSITION*. The parts, or elements, are *laid before the student* in a state of disintegration; a state in which they never exist in the human body, and the learner is to form such an acquaintance with these parts, as to be able afterwards to *recompose* the mass, by mentally combining them together. He is shown bones with their processes and foramina; the continuation of a foramen through several bones, constitutes various and far distant demonstrations; then the muscles are exhibited separate from all the peculiarities and essentials of their relations; and the simple attachments of their extremities are the circumstances on which stress is laid.

To make the student acquainted with the muscles, they are prepared *in private*, previous to the time when they are to be shown *to the class*—carefully denuded of every particle not belonging to their composition, during which process the superior layers must be raised in order that the subjacent ones may receive the same preparation. In this state, the student sees the parts in a condition, which in nature they never have, however adroitly they may be replaced by the anatomist who performed the dissection, inasmuch as their configuration must be to a certain extent materially altered during their cleaning up; and by the removal of all the connecting and modifying textures to which they owe so many of their peculiarities. The lecturer may, it is true, verbally supply the deficiency and relate how and why certain parts were removed, but this is a very slight compensation, as the student does not see what was there, nor does he comprehend the difference its presence would make. A similar difficulty arises when the other parts of the system are presented; they are de-

monstrated in a state of insulation, they are shown *alone* and almost entirely separated from their natural relations. They are successively brought before the student, and they are thus shown to him in order that he may know how they ought to be; that he may imagine them in their natural conditions and relations, by mentally recombining all the parts which are separated, and by supplying all the matter which has been displaced. Let us ask such of you as have any experience, if when present at such demonstrations, you felt as if looking at the actual anatomy of the parts? If you did not feel that something was wanting to convince you of its reality, that some link of the chain was withdrawn which seemed to destroy all proper connexion between what you *heard* and what you *saw*? Or let us ask of those who have attempted to use the knife themselves, after no other preparation than the common course of reading and seeing demonstrations thus made, what was their feeling and what their progress? Were they not universally at a loss? Scarcely recognizing any thing which had been shown them; having no idea of the manner in which the appearances were produced by the dissector, nor of the experience and skill requisite to the production of the appearances they had seen.

The ordinary mode of teaching in public demonstrations is by the most difficult process for *the student*. The person who prepares the dissection, analyses the parts in private, and then presents them to his class in order that they may see them in this condition, which leaves their connexions and relations to be guessed at; thus the operation becomes **SYNTHETIC** to the *learner* whatever it may have been to the *teacher*. To convey a general idea of

the individual parts composing the human frame, this method is adequate to the purpose; but to qualify the student for forming a correct notion of the relations and actual conditions of structure, and enable him to enter with advantage upon the exercise of practical anatomy is what daily experience shows not to be the case.

We have thus endeavoured to lay before you a fair view of the common method of teaching anatomy in public demonstrations, and without the slightest wish to detract from its merits. Indeed, were we to choose a method which would afford the greatest opportunity for *display* with the *least difficulty* to the lecturer, it would be the one just described. But not having yet forgotten our own feelings when attempting to learn anatomy from such demonstrations, we are inclined to prefer a mode which, although the most difficult for the *teacher*, is, according to our experience, the most advantageous to the *learner*.

The method we shall now consider is one which we first introduced *into the public lecture room* several years ago,* and consists in the employment of the most natural and successful mode of teaching, by making *the analysis* of the parts in the presence of the class; showing *how* the organs are connected, and how they should be separated. The difference between the introduction of this mode of teaching into the *public class room*, and employing it in *pri-*

* The **FIRST COURSE**, according to the Analytic method, was delivered in March, 1821, in the building since altered into St. Stephen's church, Tenth street, Philadelphia. The same mode of teaching was persisted in by the author, in Rutgers Medical College, New York, until the period of his retirement, with augmenting confidence in its excellence, and the decided approbation of those who were capable of comparing it with the common mode.

vate to prepare the parts for demonstration, need not be dwelt on—in the latter case an individual separates and examines the parts for his own benefit; according to the method we have adopted, the dissections are made before the eyes of the class, *at the same time* that the relative positions and functions of the parts are explained. It was never pretended that a new mode of analysis was discovered—the plan proposed was to employ a well known mode of examination in such a way as greatly to lessen the student's difficulties, abridge his anxieties and toils, and show him how to accomplish, what under ordinary circumstances must long have remained a mystery. This mode of *teaching* anatomy was called *analytic*, (not because the usual process is less analytic to *the preparer*, but,) because *the student* participates in the analysis; it was called a *new* method not because the parts had never been thus separated before, but because *it had not* previously been introduced into *the public lecture room*, in order to show pupils how to do the same in private. Whether a similar idea ever occurred to any one else we know not—not having met with, or heard of any record of the fact.

You are not for a moment to suppose that this method requires the teacher to begin abruptly with whatever part may fall under his knife, and thus to jumble promiscuously, integuments, arteries, veins, muscles or nerves. Far from it; he may be as systematic and methodical as in the ordinary mode of demonstration. We will suppose that the bones have been described and the study of the soft parts is to be commenced. The subject is brought before you untouched; you are informed that the muscles are to

be the special objects of attention, but in exposing a muscle, the class see all the parts as they are removed, and how they are connected with it, conceal its appearance, or modify its action. It is the muscle, however, which is *then* the principal object, the other parts are but cursorily glanced at, sufficiently to warn the student, that he is to encounter them and show him how they are to be removed. Having done this, the muscle is displayed; its figure, and peculiarities of origin, connexion, relative position, insertion and function are detailed, and the student knows on the evidence of his own senses what otherwise he could only have learned from the lips of the teacher. Supposing then that the muscular system has thus been disposed of, and the arterial system is to be the next subject of demonstration; the heart and vessels are laid bare before the class, the arteries are pursued throughout their distributions, and are shown in their natural relations. All the parts with which they are connected are incidentally mentioned, and the manner of removing them shown, so that the student not only learns that such and such vessels exist, but sees how they exist in relation to other organs; at what depth they are situated, how they pass to their distributions and the manner of cutting down upon them to most advantage and with greatest facility. A similar course is pursued when the nervous system is studied; the class again see the other textures, as related to this system, and become familiar with the structure, which under ordinary circumstances must for a long time remain unknown. Further explanation of this method of teaching is not at present necessary; suffice it say, that the principle of *showing the student* the actual characters of the

human structure is uniformly adhered to. There is no reason why after showing the parts in connexion, and then separating them before the class, the same textures should not be again shown, prepared in the usual way; in order by the first to exhibit their condition in the living machine; and by the last to furnish a *diagram* of any one system of parts insulated from all the rest.

We have already adverted to the fact, that the method we have proposed is not the *easiest* one, and that if the feelings of *the lecturer* were solely to be consulted, it would not be preferred. It will not appear singular then, that those who are engaged in demonstrating in the usual way should unwillingly think of relinquishing their method, or be induced to approve or adopt a more difficult new one. But, as this is a matter which is eventually to be decided by the general voice of the medical community, we do not despair of seeing the time when the usual mode of demonstration will be so far changed as to allow the student to see *in the lecture room* something of the mystery by which the parts are made to assume such curious appearances, as are *there* frequently presented. The liberal and enlightened of those who teach anatomy in the usual manner, are willing to acknowledge the difficulties and defects of their method, however little they may be inclined to use that which has been proposed to you. Those who will be at the trouble of examining and understanding, must perceive that it has the advantage of keeping continually before the student the relations of parts, and making the connexion between structure and function more evident; that it teaches the pupil how to conduct his own researches, and makes a more lasting impression on his

mind; inasmuch as he can remember what he *sees* and *hears* much better than what he *hears* alone.

In our commendations of this method, we speak, after seven years experience in the employment of it, and if we believed it less valuable than the other mode, we would at once abandon it entirely—but feeling convinced that *it is* highly advantageous to the learner, and susceptible of being improved to a still more beneficial extent, we ask for it nothing but an impartial trial, a fair estimation, and then, to be received or rejected as it may deserve.

PROFESSIONAL REPUTATION.*

THE honourable, though arduous, office assigned me on the present occasion, while it elicits the most grateful emotions, naturally awakens a regret that my efforts must fall so far short of my own wishes, not less than of what is due to such an auditory. To follow, where so many highly gifted men have preceded, allows but slight hope that aught of novelty remains to be gleaned; to address those who give this Society its rank and strength, by the professional eminence they have attained, the speaker should at least be nearly equal, if not superior, in years and attainments. How then shall we venture to interest your attention—unless by taking advantage of the fact, that the Society contains a large number of youthful members, whose improvement and future respectability she is most solicitous to insure? to these members, therefore, my observations shall be exclusively directed, and if deficient in every other respect, springing as they do from the sincerest desire to be useful, and the deepest conviction of the importance and truth of what is uttered, we may hope for the lenient judgment of our hearers.

Our profession is coeval with the distresses and sufferings of the human race, and its respectability is as universal as the benefits it is capable of conferring, when

* Delivered, by appointment, before the Philadelphia Medical Society, Feb. 8, 1826.

rightly administered; those engaged in the discharge of its duties having always been tacitly considered by their fellow men, as beings peculiarly set apart from the rest of mankind, and worthy of an estimation, not conceded to persons employed in merely secular affairs.* The real excellence and usefulness of our art, (when *worthily* practised,) has always tended to increase the confidence and admiration of the public; and, if medicine have not attained a degree of perfection and immunity from censure, equal to its venerable age and importance to society, this results from circumstances, which, however, they may have injured, are entirely extrinsic to the profession.†

Yet, our useful and excellent Science presents a great number of obstacles and difficulties to her votaries, which are only to be surmounted by well-directed and most persevering efforts. A mistake made in the outset, may exert its prejudicial influence on the whole of your subsequent course; therefore it is desirable that your principles and views should be both early and correctly formed.

The members of our profession are subjected to many temptations from ambition, which are scarcely to be resisted. Few, perhaps none of us, are willing to look upon our art as a mere mode of obtaining subsistence, whatever be our situations; we hope to gain a reputation, or fame, by the exercise or improvement of it, and this is the un-

* “El medico, en fin, que *es medico*, es digno de grande estimacion, porque es el conducto por donde Dios embia à los enfermos vn bien tan precioso como la salud: es el instrumento de que vsa la mano de Dios para hazer el mayor de los bienes corporales, y es en la tierra como vna cosa soberana, que se anda haziendo vidas.”—*Don Iuan de Zabaleta*.

† See the translation of the law of Hippocrates at the end of this discourse.

seen but ever operative cause, which urges us forward in our variously deviating careers. This desire of FAME, this hungering after the approbation of the wise and good of our species, this wish to be singled out and placed above the great mass of our fellow creatures, is a perfectly natural feeling, and of kin to immortality. To this cause we are indebted for the noblest exertions of human genius; it was this feeling which incited all the great of former days to the actions which still live on the page of history; and the same breath will continue to enkindle from their ashes, fires which shall warm, cherish, and enlighten, universal society.

There are two kinds of fame, between which it is necessary for you to know the distinctions. The first, and only excellent, is that which tempts the wise and good man to become GREAT; whose influence is not only felt during the existence of the possessor, but leaves behind it a holy light, undimmed and undiminished by the lapse of ages. This fame is built upon the solid basis of usefulness, genuine worth, and high desert. Its growth is not rapid; but its maturity is perfect; at first, it is the applause of those who are emphatically called "the few;" it is not gained until many privations and toils have been endured; yet, like the ascending sun, it surely attains a meridian altitude, and disperses by the potency of its irradiations, all clouds which would obscure or intercept its brightness.

The other kind of Fame, is "base, common, and popular." It is never the result of great intellectual exertion—often it is produced by accident, and it frequently is awarded to great vice. At first, it may *appear* bright and dazzling; but this light is the phosphorescent gleam hovering over putrefying substances, compared with the intense,

steady, and sun-like ray of that first mentioned. This second fame, is the clamorous plaudit of the deceived or ignorant crowd; it is sustained solely by the breath of the vulgar herd, and would sink forever in a purer atmosphere.

The fame that *you* should desire to win, is that which rewards the exertions of generous and virtuous minds. But, you should not only feel the proper emulation—you must be aware of the best mode of attaining your object. Let the intellectual capacity be what it may, or the impulse of ambition never so strong, much time may be wasted in ill-directed and desultory efforts, without the proper training and preparation; even giant strength may be rendered worse than useless, for want of skill to direct its exertions.

A first requisite to your success is a good education, concerning the best mode of gaining which, wise men have differed in opinion. As the great object is to enlarge the mind, stock it with images, and train it to habits of investigation and sound reasoning, “a classical education” may be stated, as of the various modes, one of the best adapted for the discipline, and development of the intellectual powers. Of this education, we consider the study of those languages, whence not only our technical phrases, but our mother tongue itself are derived, as a most essential and vitally important part.

In speaking thus, we are conscious of advancing an opinion directly opposed to notions, which of late are becoming very general and fashionable. It is easier, however, to declaim against the ancient languages, than to learn and employ them; as to the indolent, it is far more agreeable to demolish a noble edifice, than to erect even a comfortable shed.

The correctness of the opinion we have advanced, is not supported by assertion merely; it will bear close examination, and equally resist the subtilities of sophistry, or the ruder shocks of ignorance. Other preparatory branches of education have their specific value; by the aid of mathematics, the mind is sobered, sharpened, subtilized—taught to abstract itself and become concentrated on a point; to reach out and grasp the almost inconceivable combinations of numbers, or the ineffable extensions of space. But, it is with MAN that physicians have to do; in all his varieties—his excellence, his errors, and his sufferings; it is with the hidden springs of the passions and emotions of our race that we wish to become acquainted; it is with the defaced, not destroyed image of the Creator, that we are to be continually engaged. We cannot comprehend man better, than by understanding the manner in which he communicates his sensations and wishes to those around him; learning from the context of his thoughts and modes of expression, the nature of the mind whence they spring, and having gained thus much, become better able to make ourselves and our profession more useful and acceptable.

We can neither acquire, nor impart knowledge, without the use of words. These, however imperfect, are the signs of our ideas; hence, he who is acquiring a language, (if taught aright,) is, at the same time, accumulating a vast store of objects for the future exercise of his intellect, and is also forming habits of reflection and discrimination rarely to be attained in any other way.

Independent of other advantages, the languages of Judea, Greece, and Rome, are particularly worthy of regard, as containing the most sublime exertions of genius,

the most valuable body of truth; and, moreover, as being the fountains, whence the now widely flowing streams of knowledge gushed forth to animate and adorn the world, after the prolonged and dreary periods of its cheerless gloom. In the tongue first mentioned, we see language in its ancient and original form, venerable alike for its simplicity and force. By it are we instructed of the origin of our race, and the commencement of human society. In the Greek, we see language refined to the highest degree, and are furnished through it, with models in almost every exercise of human intellect. It is not only the tongue by which the invaluable observations of the primitive father of our science, are preserved; but, we have also delivered to us in the same language, the words of Him who spoke "as never man spake." In the Latin tongue we have an inexhaustible storehouse of intellectual gratification; it is, moreover, the true language of science; the ideas attached to the words being fixed, and freed from the mutations to which a living language must always be subject; it is the *key* to a great number of living dialects; forms a large part of the body and substance of our own tongue; and constitutes, along with the Greek, almost the whole mass of the language consecrated to the use of our profession. Hence, those who enter upon the study of medicine, without having learned either of these languages, necessarily meet with numerous difficulties, which the instructed have not to encounter; and even with the most assiduous attention, a large amount of their professional reading must remain unintelligible.

Opposers of classical education object, that the time necessary for the acquisition of learning, might be more profitably employed, as if the student were not learning to

think and *judge* correctly; at the same time, filling his mind with ideas, and becoming well versed in the history and characters of men. Let it be remembered, that any or all of these languages may be studied while the memory is vigorously retentive and the judgment unformed. The exercise afforded by such studies, develops every faculty of the mind; the memory is replete with words, and, if the studies be correctly pursued, the mind becomes acquainted with the things to which they relate; the habit of patiently investigating, and understanding the philosophy of modes of expression, teaches proper care, and gives us greater skill in our own language; and the attention is awakened to its true value and meaning, which otherwise might be neglected from habit.*

You may inquire how the acquisition of such knowledge is to assist *you* in becoming distinguished in your profession? The answer is easy; nothing is more essential to the success of a physician than a facility of communicating his own sentiments, as well as of understanding the sentiments of those who consult him. He must approach persons of every rank in society, and commune with every variety of intellect. Possessing a well grounded knowledge of language, fully acquainted with the true value and nature of his own, which is derived from various other tongues, he is always prepared; whether by speech or

* In urging the importance and necessity of classical learning to those destined for the profession of medicine, it is no part of my intention to state, that the *manner* in which the languages are most generally taught, is either the best or even the true one. It is but too common to ascribe the faults of *teachers* to the thing taught; to prejudge and condemn an unexplored region, because the *ways* leading thereto chance to be foul.

writing, he addresses those with whom he is concerned successfully, because he is sure of making his wishes or opinions plain and intelligible to all. Classic learning has another influence, not less powerful nor beneficial, on the human mind: the books, which should be studied, continually present the most excellent sentiments and morals, conveyed in the most refined style, and the superiority of such refinement, over coarseness and vulgarity, will imperceptibly lead the student to a habitual imitation of them. The virtues of the good and the wise, and the examples of the truly great, will invite to a similarity of behaviour; while the *conduct* of an elegant *scholar*, will be a perpetual recommendation to the intelligence and acquirements of the *Physician*.

Every commender of the learning we have spoken of, exposes himself to the charge of being prejudiced, or having too much veneration for mere antiquity. Instead of attempting to disprove such an unfounded accusation, let us employ the words of a celebrated author on the same subject. "I have, (says he,) a great reverence for posterity: nor do I think lightly of the learned men of the present day; there are many, I know, who adorn our age, who would have ornamented any period; yet among the whole number I have not known one who did not cultivate and honour ancient learning, whose wisdom was not similar to that of the ancients, or who did not admire and observe their precepts; from which, in proportion as you depart, you wander from nature and truth."*

* "Magna interim ducor Posteritatis reverentia: non ideo tamen minoris æstimo doctos viros qui hodie vivunt; multi sunt fateor, qui seculum nostrum exornant, qui priora potuissent exornare; in quibus tamen ne unum, quidem novi, qui non honoret et colat antiquos, cui non idem

Many of the younger members of the society, now present, are, ere long to receive the honours of the profession, as a testimonial of their diligence and faithfulness as students, and will then be preparing to take their stand among the guardians of the public health. The boisterous sea of the world is attended with comparatively few dangers, to those who have not trifled away their time, and who set forth under the guidance of correct principles. Though you know not in what haven you may ultimately cast anchor, the possession of a sound, moral, and professional education, will insure your safety through all the turbulence you may be exposed to, during your voyage.

The greatest evil to be guarded against, when you commence your efforts for professional distinction, is impa-

quod illis sapiat, aut qui eorum præcepta non observet; unde quantum aberraveris, tantum ab ipsa natura et veritate discesseris. [Neque verear confirmare non esse difficilius sine luce oculis objecta perspicere, quam solidam laudem adipisci et ingenium excolere, aliis rationibus quam quas Græci et Romani nobis præscripserunt.]—AND. DACIER.

The following observations of the learned HARRIS, on this subject, may be offered in support of what Dacier has advanced above. “To be *competently* skilled in the ancient languages is by no means a work of insuperable pains; the very progress itself is attended with delight, and resembles a journey through some pleasant country, where every mile we advance new charms arise. It is certainly as easy to be a scholar as a gamester, or many other characters equally illiberal and low. The same application, the same quantity of habit will fit us for one as for the other: and as to those who tell us with an air of seeming wisdom, that *it is men*, not books, we must study, to become knowing; this I have always remarked, from repeated experience, to be the common consolation and language of dunces. They shelter their ignorance under a few bright examples, whose transcendent abilities, without the common helps, have been sufficient *of themselves* to great and important ends. But, alas! ‘Decepit exemplar, vitiis imitabile.’”—HERMES.

tience and instability of purpose. It will be wrong in you to anticipate that business, can in any situation, immediately follow your annunciation of being ready to receive it, more especially, where you are to meet with competition from a member of the profession already established. The first half year of a young physician's residence in a strange place, is the most trying part of his probation, for should he mistake fewness of calls for neglect of his merits, or suppose that he will never be employed, because he is not immediately preferred to another, he is in danger of becoming unsettled, restless, neglectful of his books, society and acquaintances, thus sacrificing the very means of his eventual success. If, however, we recollect how much people are prejudiced by education and habit, we shall find no fault with them, for not employing a stranger on his first arrival, neither should we suppose their prejudices to be immoveably fixed. A proper degree of patience, and an improvement of those opportunities that are every where presented of winning confidence, will in no long time, yield us that opening, which is the great requisite to future profit and eminence. Wherever we attempt to establish ourselves, except under very extraordinary circumstances, some time must be passed in acquiring the confidence of those around us, by the recommendations of our friends, by our own deportment, and the event of such cases as may be incidentally thrown into our hands. However unimportant any such particulars of conduct may individually appear, they are of great moment collectively viewed; as every circumstance in the appearance, conversation, and character, of a newly-arrived physician, is of deep interest to those among whom he wishes to remain.

It will be unjustifiable to trust your success in the slightest degree to accident, because accident has occasionally given currency to men neither remarkable for education, talent, nor judgment. Accident *has*, at times, given a man of the highest merit an introduction to extensive business; but we must never forget that accident cannot sustain our reputation, nor minister to our continued success. Our greatest care must be to acquire reputation, by a diligent cultivation of our talents; though we should never neglect to improve any accidental success, in all honourable ways, to forward our professional views. If a character for skill and discernment be acquired suddenly, we must not attempt to increase it, by endeavouring to extend this reputation to the utmost stretch of possibility, but by displaying new instances of talent and intellectual strength, thus substantially augment our capital of fame. The fortuitous elevation of men destitute of true greatness of character, is almost universally followed by reverses as sudden and severe, as this elevation has been great. This is frequently exemplified in the fate of those who have a great air-built reputation, and much verbal fame; who, instead of modestly refusing a part of the honours, proffered them, and exerting themselves *to prove* that they are worthily praised, receive the whole as no more than their right, and leave their admirers in a short time to discover that their extraordinary pretensions are unfounded, and that their reputation is nothing better than the gratuitous offering of ill-judging and partial friends.

Next to an acquaintance with the principles* of the pro-

* "I would not be understood in what I have here said, or may have said elsewhere, to undervalue EXPERIMENT, whose importance and

fession, and correct moral feeling, the young physician should most rely on the exercise of what may be summed up by the word *manners*. This embraces his general intercourse with society, in which he should display that habitual ease and cheerfulness, which results from correct habits of thought and action; and that kind attention to the wishes, prejudices, and necessities of those he associates with, which shows that he possesses the most generous and elevated feelings. To be accessible and attentive, without familiarity or cringing; to be mild, gentle, and forbearing, without sinking into tame submissiveness; to be ever ready to act, when called on, without being officious or intrusive; and to do full justice to all those with whom he is professionally concerned, will insure a physician a degree of public respect, that may at length amount almost to idolatry; filling every bosom with kindness towards him, and every mouth with his praise.

The sagacious Lord Bacon has given a rule for increasing our knowledge, and insuring conversation with all sorts of persons, which is one of the best that could be devised, and one more positively conducive to popularity can scarcely be imagined. This is to learn something from all persons, whatever is their occupation, when we chance to be with them; this is always to be accomplished

utility I freely acknowledge in the many curious nostrums and choice receipts with which it has enriched the arts of life. Nay, I go further—I hold *all justifiable practice in every kind of subject* to be founded in EXPERIENCE, which is no more than the *results* of many repeated *experiments*. But I must add withal, that the man who acts *from experience alone*, though he acts ever so well, is but an EMPIRIC OR QUACK; and that not only in medicine, but in every other subject.”—*Harris's Hermes*, 352.

by inciting them to speak of what they know. As every man is better acquainted with his own business than we can possibly be, by inducing him to converse on the subject, we not only gain some valuable ideas, but we win his regard by manifesting an interest in what so peculiarly interests him. By adopting this method of Lord Bacon's, you need never suffer from tedium in the company of unlettered men, nor need you in the slightest degree descend from your place, while judiciously exciting their remarks. This is not merely applicable to your intercourse with persons of inferior standing in society; the most learned, refined, and accomplished men are equally pleased to find, that their pursuits, avocations, and interests, are interesting to you. You may frequently induce such persons to display before you a stock of knowledge which otherwise would have been withheld, and you will part mutually satisfied, instead of being in ignorance of, or prejudiced against each other.

This rule may be observed with the utmost sincerity, and without the slightest approach to the meanness of flattery. The information thus to be acquired, will in general be far more easy of attainment, as well as more valuable than can be gathered from many books; and, you will at the same time be forming a more profound acquaintance with human nature, and also gain friends. Kindness, uniformly produces kindness; confidence, inspires confidence. If we examine ourselves, we shall find that we are as excitable in this way as others, for we never deliver our thoughts with more force and feeling, than when we reply to interrogations on subjects in which our minds are most deeply engaged.

In all your intercourse with society, as well as in all

your thoughts and actions, cultivate an habitual tenderness of regard for TRUTH. By this I would not pretend to warn you against the disgrace of *falsehood*; but, that you should guard against a habit, which is almost as common as the human family is numerous, of suffering apparently harmless exaggerations to escape. *Truth* and *falsehood*, like light and darkness, are opposite extremes—the one is as excellent, as the other is base. But there are a great many aberrations from TRUTH, which the world does not consider to be absolutely FALSE; as there are many deviations from HONESTY, which, by a similar laxity are not considered as positively *dishonourable*. If my wishes could influence, you should begin your career with resolving to adhere to the *full purity* of truth, and the perfect *honourableness* of honesty; so that when the day of your success arrives, you may look back on the means by which it was attained, without breathing a sigh of regret, or suffering one blush of shame.*

Our profession has long been subjected to the charge of “envy, hatred, malice, and all uncharitableness” among its members; and unfortunately, too much of the charge is well founded. We cannot at present enter into an investigation of the causes by which this state of things has been produced, although it does not affect the profession to the degree which persons commonly suppose.† To les-

* “Si rectam rationem sequens, id quod instat, agas diligenter, firmiter, æquo animo, neque instituto negotio alia admisceas, sed tuum genium sincerum conserves, perinde ac si jam is tibi dimittendus esset; atque ita si perseveres nihil expectans, nihil fugiens sed eo quod in præsentia secundum naturam agis, et HEROICA in dictis VERITATE contentus; bene vives.”—MARCUS ANTONINUS.

† “Cierto que en parte merecen esta pena los buenos medicos, pues

sen this evil, and avoid meriting such an accusation, make it a rule never to speak of a professional rival, unless you can speak to his advantage; if he have merit, allow him the whole of it, and give your sentiments of his talents with the unaffected earnestness of truth. Do not imagine that your acknowledgment of his merits, will hide his defects, or obscure your own good qualities. Grant that he adopts a contrary course, speaks ill of you, or throws out insinuations intended to be prejudicial to your interests;—then is your triumph complete. Think you that men will not contrast his mean and soulless conduct, with your manly and honest candour? Think you that he will not more deeply condemn himself, by attempting to misrepresent *you*;—that society will not visit his ungenerous conduct on his own head, while the profession silently spurn him from their confidence?

Should you be eminently successful after others have failed, avoid pushing your triumph so far as to wound the feelings and outrage the pride of your less fortunate competitors. Your success is sufficient for you, and by judicious deportment, you may compel a man to respect, if he does not esteem, who might otherwise cherish against you a spirit as stern as hate—as inexorable as the grave. If after such success as we have alluded to, you hear of dis-

tienen parte de culpa de que *se admitan al uso de la medicina tantos hombres* que no eran buenos para Albeitares. ¿Porque no avian de reparar mucho los medicos doctos, los de la primera classe *à quien està cometido el examen* de todos en las meritos de los que aprueban? ¿Cosa es tan sin precio la estimacion del arte? ¿Cosa es de tan poca importancia la salud de los hombres, que se pueda poner en las manos de vnos Echacantos? En *faltando la estimacion à LA FACULTAD, falta vn motivo grande* para aprenderla.”—DE ZABALETA.

paraging suggestions made against you, by one you have set aside, or overshadowed, you are neither obliged to know, nor resent it;* you would owe it to the dignity of your own character, to recollect that some allowances are to be made for mortified feeling, as well as that no malicious insinuations can stand against the daily repetition of actions, which prove you exempt from a grovelling and miserably irritable disposition.

That you will not attain the professional elevation you desire, without struggling against hosts of difficulties, and encountering every degree of opposition, is most certain. It may be, that the iron grasp of poverty, for a considerable time, will impede your progress and enfeeble your efforts. Against rivalry and opposition, your armour of principles and determined perseverance will afford every security, and poverty itself may be made to minister to your success, by urging you to the display of your noblest powers. † Look at the men of talents, who now lead the van of our profession and are considered as its ornaments. Who are they? Men born to fortune and reared in the lap of luxury? No. Men who have been elevated by protection and patronage? Who have been favoured by circumstances, or raised by accident? No. They are, most frequently, those who have emerged from poverty,

* “Ulciscendi optima ratio est, ne similis fias ejus qui injuriam fecit.”—MAR. ANTON.

† “Tales excelsioris animi homines laborem ardua et obstantia quæque non metuunt non solum sed spernunt et pro nihilo habent. Hi, eo genere militiæ militant, quo, tanquam ad certissimam tendentes victoriam, nihil desperandum esse putant. Hos nihil deterrere potest, quantivis etiam periculi plenum; neque quicquam tam alte a natura positum esse arbitrantur, quin suam virtutem eo attingere posse certi sunt.”—REINWARDT.

if not obscurity. Many of them have been nursed in sorrow, and baptised with tears;—they have protected and patronised *themselves*, until the great and powerful have become proud to rank as their friends: they have *made* the very circumstances, which superficial observers suppose to have been the *causes* of their elevation. It is the triumph of talent, of genius, to rise in proportion to the magnitude of difficulties; to trample the opposition of malignant mediocrity into the dust; and gaining its merited elevation, to raise the profession it has chosen to a corresponding degree of eminence.

In addition to all other means of augmenting your true fame, the observance of one circumstance will be of great importance; this is the unremitting exercise of humanity towards those who seek your professional aid, whatever be their conditions. The character of a truly good *physician*, is one of surpassing excellence, and his reputation is the most exalted we can hope for. He is the friend of the wretched and woe-worn; the cheerer of the despondent; the solacer of the broken-hearted. His soul is the empire of benevolence—his actions the result of a principled charity, and unaffected good will. He is a blessing conferred on the society in which he lives, and an honour to the human race. Wherever the afflicted dwell—wherever the voice of suffering is heard, he is to be found. The diseased find cheering and consolation from his presence, and the sounds of sorrow are stilled. Even when hopes of life can no longer be given, he calms the tumultuous grief of relatives, by recalling their thoughts to that better world, where sickness and sorrow are to be no more—“where the wicked cease from troubling, and the weary are at rest.”

Such are the common offices, and frequent exercises, in

which he is engaged. His character, even under ordinary circumstances, may be contemplated with gratifying emotions. But there are conditions in which he is presented in a more sublime aspect. It is when the lurid breath of pestilence scatters destruction, desolation, and dismay throughout the land, and death tramples with indiscriminate fury over the people—when the ties of relationship and affection are sundered by the violence of fear, and utter selfishness seizes on the hearts of men: then the good physician unmoved by such examples—untouched by terror—regardless of himself, is seen actively discharging every duty. Then, he becomes the father, the brother, the friend, of the destitute: his steadfast attention smoothes the pillow of the dying; he inspires the desolate with hope, and, like a beneficent angel, wherever he goes is a dispenser of good. Who can estimate the feelings, or measure the fame of such a man? Who would not imitate his example, for such a reward? What is there in death's most frightful forms, that could withhold us from attempting to deserve it? It is a glorious privilege which our profession confers, of inscribing our memories, not on perishable marble, but, in the living affections of our fellow men, to be cherished as long as our race shall endure.

Since the commencement of the present session of the society, some of our young friends, who entered on the career with hopes as warm, and eyes as bright as ours, have been called away to the "narrow house," and their spirit-stirring bustle of youthful expectation, has been exchanged for the solemn quiet of the tomb.* While we sympathize with such as mourn over youth snatched away in its blooming, and warm hopes chilled by the icy hand of

* Several had then recently died of small-pox.

death; while we sorrow over the mental anguish of those, whose far distant parents were not permitted to minister to their last earthly wants, or receive their dying sighs, let us not forget to be thankful, that we are still spared to usefulness and virtue. Yet a little while, and the mighty ocean of oblivion will overwhelm us in its fathomless depths, sweeping away every trace of our existence. This is not matter of regret;—all nature tends to one common point, disintegration and change of form;—the cloud-capped and tempest-braving mountains, towering in seemingly indestructible grandeur, are hourly yielding their atoms to the earth and to the air. Virtue ALONE survives all change; the immortal mind bids defiance to the destructibility of matter.

Build then your monuments, imperishably, on the love of mankind; by sincerely devoting yourselves to the cause of humanity; to the honour of your profession and country; to the faithful service of your friends; to the humble worship of God: thus, the necessary evils of life, will pass over you unheeded; and the inevitable shaft of death, while it stills forever all mortal disquiets, shall be unable to disturb the serene and exstatic composure of your intellectual being.

ἹΠΠΟΚΡΑΤΟΥΣ ΝΟΜΟΣ.

[EX RECENSIONE VORSTII.]

Law of Hippocrates.

Medicine is the most excellent of all arts; but, on account of the ignorance of some who practise it, and of others who rashly judge, it is esteemed among the lowest. This error appears chiefly to arise from this cause; it is peculiar to medicine, that it has no punishment but disgrace, which affects not those who spring from ignominy. Physicians of this kind are very like the mutes which are introduced in tragedies. As these have indeed the figure, dress, and appearance of players, though they are none; so there be many persons both by title and reputation *physicians*, while there are very few such in reality. Whoever wishes to devote himself truly to the science of medicine, should strive to fit himself for the study both in disposition, learning and place; by early education, attention, industry and time. The first requisite is certainly disposition, (or nature,) for should this be repugnant, the rest are vain; but, when disposition urges us on the way, the most excellent learning of the science may be attained. It is necessary to evoke this disposition prudently, so that it may flow from early education, in a place naturally accommodated for such discipline. But the greatest industry should be exerted, and that for a long time, to the end that discipline may be ingenerated and changed to nature, and produce fruit happily and copiously.

The same consideration may be applied to the study of medicine, as to things which are produced by the earth. Our nature, [or disposition,] is the soil: the precepts of teachers are the seed. Education squares with the comparison in this, that the seed should be sown at a proper time. The place in which the discipline is pursued, is like the ambient air, affording nutriment to the plants springing from the earth. Study is cultivation; lastly, time strengthens the whole, that they may be perfectly matured. Were these circumstances observed in relation to medicine, and properly engaged in its study, we should then have walking in our cities, physicians, not only in name, but in truth. Unskilfulness is a bad treasure, and an unfortunate opulence; those who possess either the reputation or reality of it, being devoid of tranquillity and ease of mind, as it is the nurse both of timidity and audacity. Timidity argues weakness, and audacity ignorance of our art. Science and *opinion* are two; the former instructs, while the latter makes us ignorant.

ARGUMENTS IN FAVOUR
OF THE
DISSECTION OF THE DEAD, &c.

THE duty we are honoured with, in this Institution,* is that of making known the construction and admirable modes of action of the parts composing the human body. The importance of our subject can scarcely be overrated, however it may be misunderstood: it is in itself so excellent, so universal in its application to philosophical and rational medicine, so beneficial to humanity, and admirably suited for displaying the infinitely beneficent wisdom of the Creator, as to be justly entitled to our most profound attention, and worthy of our noblest intellectual energies.

With such a theme to dilate upon, the only difficulty is to decide *where* we shall begin:—numberless interesting topics court our selection; each, capable of affording the purest gratification to minds hungering after knowledge—or which delight in exploring those works of nature that are veiled from vulgar eyes, but may always be advantageously scanned by those who tread in the paths of science, with enlightened reason for their guide.

On the present occasion, we shall content ourselves with laying before you a general sketch of the rise, progress, decline, and decay of the human body, preparatory

* Rutgers Medical College, N. Y.

to some considerations relative to the practical study of our subject, which we are solicitous to urge upon the attention of society at large. We shall then conclude by especially addressing those who are to be the immediate objects of our care.

Man, who eventually becomes "Lord of Creation," by his superiority of intellectual endowment, enters upon the field of his future greatness the most feeble and helpless of all living beings. He is too delicate to sustain the changes of the air he is to breathe: his hands, those admirable instruments, the makers of all other instruments, are useless and unmanageable. The capacious head, the future throne of his intellect, is too heavy to be supported by his own strength; and his inexpressive eyes are incapable of being advantageously directed towards any object. Without the loving and unwearied assiduity of his tender mother, death would speedily silence his feeble wailings; for the flower of the fields, which blooms but for an hour, and then withers away, is not more delicate nor susceptible of destruction, than is the life of the human infant. But, clasped by maternal arms to that fountain of sustenance, which may so justly be termed sacred, from its constituting the first and most endearing link in parental and social feeling, man drinks in life and warmth; his eyes soon learn to distinguish objects, his strength is increased, his senses begin to demand his attention, and that education commences, which is to fit him for assuming his rank among rational and intelligent beings.

These successive changes very gradually ensue: he requires parental attention and assistance long after he has ceased to nestle in the bosom of his mother. At this period his senses are all susceptible and vigorous; his mind

begins to exist; it is capable of receiving knowledge, but is not yet an active instrument. Memory is now retentive, and predominates over the other faculties. It is the season when the mind requires the most judicious direction, in order that things may be learned by their right names, and in the right places: it is the period when the dawning intellect demands the most scrupulous superintendence, that the earliest indications of peculiar bias may be detected, and encouraged or repressed, as circumstances may require. It is the time, of all others, when the most sacred regard to truth should be observed by those who have intercourse with the young—*truth*, not only in relation to great things, or as opposed to direct falsehood—but that truth which states no improbabilities, no fictions, no mysteries; in short, the truth of correct example, in action, word, and look.

The condition of childhood or adolescence is the spring-tide of our existence. All sensations are new, all scenes are inviting; every object is a source of gratification to curiosity. The number and rapidity of our sensations keep up a continual succession of images in the mind; and one so immediately displaces the other, that, whether painful or pleasurable, they soon disappear; the hours fleet away with winged swiftness, not counted, though deeply felt; not individually productive of remarkable consequences,—but for ever after treasured in the memory, as the times of peculiar happiness; as the days long gone by; as the golden age of life, for ever fled.

To this period succeeds that of beginning maturity, when the body acquires its full growth, and the slender and awkward boy imperceptibly changes to the vigorous and graceful man. His piping and treble voice, passing

through various irregularities, assumes that sonorous strength of intonation so well befitting his condition. The cavities of his skull, previously unmarked by external prominences, now expand. His brow becomes elevated; his eyes more deeply seated in their sockets; his cheeks are broader and higher, and the passions and workings of his mind become imprinted upon his countenance. The rosy, unmeaning, and frolic expressions of his visage are gone; his air is thoughtful and serious. Those who were familiar with him as a child, experience an awkward restraint in addressing him; his parents are conscious of a change without being able to define it. His very mother, who nursed and cherished him through all his infantile troubles, learns to listen to him with respect, and look upon him with reverence. Henceforth, he assumes his station as a member of the great human family, responsible for his actions solely to his country and his God!

The approach of his sister to the same period of existence, is marked by analogous changes in external appearance, not so striking for their magnitude as from their peculiar character. The whole expression is wonderfully altered; there is a singular addition of loveliness to features which may have previously been considered uninteresting and even repulsive. The form, the voice and gestures all declare, that "Nature's last, best work," has assumed all her charms, and is no longer to be approached, except with that homage which her loveliness and innocence never fail to inspire, especially when their natural power is augmented, by that cultivation of mind which imparts vigour to intelligence, and tenfold attraction to beauty.

We next consider our race in their maturity, or sum-

mer. The faculties of the mind are advancing to their perfect state: judgment, or the power of deducing conclusions and principles from observation, predominates over the memory, and the mind is capable of most intense application to any pursuit. This is the season for exertion; the time for providing future subsistence; for attending to the education of our offspring; as well as for fixing our own habits of thinking and acting. It is the season for conferring benefits on our fellow creatures by the employment of our leisure, and winning that influence which is necessary to the more effectual discharge of the debts we owe to society. At this period, the body, which has ceased to grow in height, acquires a greater degree of breadth and fulness. The soft and delicate texture of the solids gives place to a greater rigidity of fibre, and the strength of the limbs is in full vigour. This period endures for a variable lapse of time, modified by temperance, exercise, climate, and occupation.

Next, autumn comes, the season of the "sere and yellow leaf." The suppleness and mobility of the limbs diminish, the senses are less acute, and the impressions of external objects are less remarked. The fibres of the body grow more rigid; the emotions of the mind are more calm and uniform; the eye loses of its lustrous keenness of expression; the skin hangs loosely; the teeth generally begin to fail, if they have not previously, and the digestion proportionably declines. The mind no longer roams abroad with its original excursiveness, though it is still capable of intense and advantageous application to particular studies. The power of imagination is in great degree lost. Sad experience has robbed external objects of their illusiveness; the thoughts come home: it is the age

of reflection! The flight of time is also marked by the change of the firm tone of manhood for an occasional jarring and dissonant note, and the head either exhibits the venerable snows of age, or the hair falls off from the place it has so long protected and adorned. At this season we reap the full fruit of our early labours, and live over again in the persons of our descendants. It is the period in which we receive the just tribute of veneration and confidence from our fellow men, if we have lived to deserve it, and are entitled to the respect and confidence of the younger part of mankind, in exact proportion to the manner in which our own youth has been spent, and our maturity improved.

“Last, comes the lean and slippered pantaloon.” The marks of decline and decrepitude become more perceptible. The teeth are all gone—the jaws approach each other—the face is sunk—the eye quenched in rheum—the voice feeble, unequal, and whistling—the muscles wasted—the gait tottering—the sight and hearing rapidly fail—and the other senses are almost obliterated. The mind lives not in the present—the memory acts not upon things of to-day. The green hills, the joyous gambols, the pure friendships of childhood all thrill through the heart. The ancient man sits in the midst of a generation thrice removed from his own: he appears insensible to those around him—he is deaf, and participates not in their joys: he beholds *their* sorrows with a cold unfeeling eye. But why does he, at times, convulsively grasp his staff—and why does an unheeded tear occasionally trickle down his furrowed cheek? He is looking back, beyond the existence of the present generation: perhaps the image of her who has slept in dust for half a century,

she in whom his youthful heart was “garnered up,” appears before his memory as once she bloomed: perchance the mother who watched or wept o’er his cradle, and enhanced the joyousness of early life, is breathing in his ear; or the bosom friend and companion of his youthful wanderings smiles upon him, with the truth and ardour he has so long been a stranger to. Where are *they*?—Another people has grown to maturity since their graves were sodded. Their memory has perished, except in the aged man, whose long-dried fountains of sensibility gush forth afresh as such recollections rise within his mind.

The approach of death from slow-coming decline and infirmity of nature, is marked by the eventual obliteration of all the faculties of mind and body. The breathing becomes slower, and slower; the heart intermits its pulsations; the blood loiters along the veins; the extremities grow cold, and the feeble flame of life lessens until it ceases to be perceptible, except at the centre, where it faintly glimmers for a time, and then is gently extinguished without sigh or groan—without a trace of emotion or of pain.

We have thus, in a cursory manner, followed man from the cradle to the grave; but we are well aware that few persons are permitted to experience all the seasons and changes we have described. Accident and disease are daily destroying vast numbers of our race in every stage of existence; bidding us to look for more enduring happiness than can be founded on so frail a tenure as human life. It is, however, a fact, that our fondness for life increases in exact proportion as it diminishes in value. In the early part of our existence, death is braved, and danger courted, as if life were of slight account, or could not

readily be lost. Death is not feared, because to the young it seems distant and improbable. In maturity we are more cautious, having learned something of the true value of life, and feel more convincingly the probabilities of losing it. But in extreme old age, when all enjoyments are at an end, we cling to the cup to the last, and drain it to the bitterest dregs; even then relinquishing it solely from inability to retain it still longer at our lips.

Yet we are not to suppose that every season of life, except that of extreme decrepitude, has not its peculiar pleasures. Those of youth, and middle age, most of us are acquainted with; Cicero has left a delightful description of those of advanced life, which Erasmus, a learned and pious christian, says he could not at any time read, without having his eyes to overflow with tears of pleasure.

It is not from man alone that nature exacts this tribute of decay. If we extend our observation throughout the universe, we shall discover analogous changes going on in all animate and inanimate matter. There is *in all things* belonging to our globe, a perpetual tendency to *change* of form, without the *destruction* or *annihilation* of any one principle. Whenever animation is finally suspended, the chemical affinities of the mass come into operation—the forms which lately withstood all external changes, become affected by the slightest vicissitudes of heat and moisture, and speedily putrefy. The co-operation of vast numbers of insects hastens the disintegration—the aqueous and aerial particles exhale, while the solid and more earthy portions go to aid in the composition of a richer soil, for the benefit of other forms of animated bodies. Thus, all things *must* change, according to their nature, from the granite mountains to the mushroom on the dung-

hill. It is the attribute of GOD alone to be “without variableness or shadow of turning”—to be immoveable, while all else is in unceasing motion.

Tu! tempus ab ævo ire jubes
Stabilisque manens, das cuncta moveri!

Boëthius.

Yet, notwithstanding that the All-wise has ineffaceably impressed the character of mutability on all matter, human pride and affection have, in various ages and countries, attempted to give an artificial permanence to forms, sealed for destruction by the very laws of their composition. These laws, irresistible in their operation and certain in their effects, are infinitely perfect and beneficent; for, when life is prolonged to its latest term, they secure the gradual abstraction of all the senses connecting us with the external world, and when death ensues, cause a speedy removal of materials, which might prove noxious to other beings.

Seeing then that man must die—that the sentence must be accomplished—“dust thou art, and unto dust thou shalt return,”—what are we to think of those, who are so restricted in their modes of thinking, as to feel and express towards the cultivators of our glorious science, prejudices worthy of the most unenlightened times? Well informed upon almost all other subjects, vast numbers of men appear to shun information upon this; like children, who lie shuddering all night at a shadow upon the wall, fearing to approach it closely, and dispel their idle terrors. Such persons associate the idea of anatomy with barbarousness and cruelty. They regard the man who strews the plain with thousands of dead, immolated for the gra-

tification of his ambition, as a *hero*, worthy of laurels and applause; while they view the devoted student of our science almost with disgust, and are ever ready to join in the clamour against him as a violator of the *repose* of the tomb; a disturber of the *dead*. Strangest of all, this happens in a christian land—where devout and faithful ministers of the gospel are daily engaged in declaring that the soul is immortal, the body corruptible and evanescent, and the Creator omnipotent!

No individual can feel greater abhorrence at the outrages occasionally committed upon the feelings of surviving friends, than we do, because we believe such actions to be both *unjustifiable* and *unnecessary*. The prisons, penitentiaries, and lazar houses of our country, daily send forth multitudes of dead, who, having seldom or never contributed to the well-being of society, during life, should all be made tributary to their fellow creatures after death. Far from storing these bodies away, during winter, heaping them up to taint the freshness of the ensuing summer's air, they should be devoted to the improvement of medicine, the extension of knowledge, and the general good of the human race. Wherever this proper and judicious use of such subjects is permitted, encroachment upon private places of interment is utterly unknown. The anatomist has it always in his power to prevent it, by warning his servants that if they transgress in that way, he will immediately deliver them up to deserved punishment. But the direct operation of all clamour or restrictive regulations, on this point, however severe, is to produce the very evils they are intended to prevent. If the risk be great, and the peril of life and property highest in degree, the anatomist seeks the material for his studies,

wherever suspicion is least liable to fall. It is in vain to think, that laws can be made that will put an end to the study of anatomy. Medicine cannot exist without it; the people themselves demand that their physicians should possess a knowledge of it. But laws may be made which will drive students from our borders, to situations free of such besotted prejudice. Laws may be made which can turn perennial streams of wealth from our own citizens, and bestow, not only the money, but the high scientific character our sons may obtain, upon the institutions of other places. We repeat it to be unnecessary that such an occurrence as the breaking into private grounds should ever take place, were the proper policy in relation to the public ones pursued. The feelings of friends need *never* be subjected to the agonizing emotions that are produced by the clandestine removal of the bodies of those they have loved.

But, as to the *repose* of the tomb—the *disturbance* of the *dead*—it is mockery of common sense, and totally absurd: it impugns the verity of the religion we believe most holy; it is an indignity offered to the character of the Supreme! What avails your profound interments—your six feet of earth—or iron coffins or leaden shrouds? The moment life departs, every breeze that blows wafts myriads of insects to the feast: they deposit their eggs unseen by the friends who watch at the side of the corpse; committed with the body to the earth, they are dormant only till sufficient heat is evolved by putrefaction to call them into activity; then they feed to fatness on the rankling corse; and when ready to assume their perfect shape, work their way to the surface, and wing their flight to repeat a similar process upon other dead. Tell us then of

the *repose* of the tomb—when the bodies we so carefully deposit in earth are not only dissolved by the chemical affinities of their own elements, but serve as food to myriads of insects, and are, sooner or later carried abroad upon the four winds of heaven. Grant that every precaution be taken; and that we pile defences around these perishing relics, heaping brick, or marble, or granite upon them? It is but deferring the disturbance of their *repose* a few years longer, until the monuments themselves perish and are no more, from the uninterrupted operation of those laws which command all matter to change form. The finest sand washed by the surf on the shore, once formed an integral part of mountains, which might, in their day, have been called everlasting, but which nature forbade to be immutable!

The object of the science we come prepared to teach, is, to display the curious and wonderful structure of man: to investigate the causes of disarray and disease, in order to minister to the afflicted; it is to examine the dead before their first great change of form, in order that we may successfully bind up the wounds and mitigate the sufferings of the living. It is not mere curiosity that leads us to endure all the privations and unpleasantness of making such investigations. We come with the respectful and serious earnestness of men aware of whose presence we are in: we study the instruments of motion, that we may prevent it from being suspended; we associate with death, that we may preserve life; we submit to a sad and solitary silence, that we may speak peace and health to the diseased; we breathe noisome, sepulchral vapours, and drive the life-blood from our pallid cheeks to stagnate round our hearts, that we may gain the only knowledge which can efficient-

ly aid us in warding off the thousand ills that frail mortality is heir to.

Surely we have enough to endure, we suffer enough in feeling and health, in foregoing the enjoyments of social life, and in encountering the stupid misrepresentations of the ignorant: might we not be permitted to hope, that we should escape the prejudices of those who would fain be esteemed enlightened? The man who devotes himself to a life of toil and privation for the benefit of his friends and country, is lauded for his self-denial, his benevolence and patriotism; but he who transcends the influence of prejudice and ignorance, who separates himself from his fellow-men in order to serve them, who schools his own feelings to endure what otherwise would be as repugnant to him as to others, and submits, without complaint, to all the accidents connected with a study so generally misunderstood; instead of being considered, as he actually is, a benefactor to his race, is too often regarded as something unnatural—insensible to all human emotions, or worthy of reprehension and injury for the very conduct which gives him the strongest claim upon public gratitude and respect. Enough, we hope, has been said on this subject, to induce those who are not of the profession to feel the importance of aiding us in correcting public sentiment, and giving that freedom to our science, which will secure its benefits to all the world.

We shall conclude the present address by devoting a short time to those who are to be the peculiar objects of our attention, and who are to receive at our hands all the advantages that our reading, observation, experience, and industry, can suggest for their instruction.

He must be more than a stoic, or less than a man, who

can look, without emotion, upon an assemblage of those who are dedicated to such a profession as ours, which is to demand all their energies, and is to occupy their entire lives. Commencing with all the buoyancy of youth, in all the eagerness of inexperience, the student of medicine is apt to see nothing in the prospect but emoluments and honours; he hears nothing but sounds of encouragement; he is impelled by a warm and generous enthusiasm, which fears no difficulties, nor anticipates the least delay. Caution him that many have failed in this brilliant career—he refers you to the glorious few who have triumphed. Tell him the heights he would ascend are perilous—he still believes that to him they will not prove inaccessible: the benumbing influence of despondency has not yet been felt by him, and why should he think of despair? If, then, we may not hope to impart to the young the prudence which is to be derived from experience alone, we can, at least, effectually serve their interests, by directing their efforts in the most advantageous course, and preventing the waste of that enthusiasm which is to bear them successfully through all the evils incident to so great an enterprise.

The student of medicine, while glancing over the vast field he is destined to explore, is frequently tempted to halt in his career, and exclaim with the illustrious father of our science—"Life is short, art is long; experience fallacious, and judgment difficult." If the industrious be occasionally disheartened, and those who eagerly seize on every opportunity of gaining knowledge and augmenting their intellectual strength be inclined to despond, what must be the eventual condition of those who loiter through the period of their studies, as if the great business of life

were a jest, or knowledge could be acquired without the effort of a thought. Reflecting upon the business we are engaged in, and the responsibilities to be assumed, it becomes evident, that no time is more valuable and important to us, than that in which we attempt to acquire the elements of our professional education, whence we are to derive the power of deducing principles of action from the study of facts. It is required of us when we enter upon the practice of our profession, to examine, compare, and decide at a single glance, as if by intuition, in many cases where the decision may result in the safety or destruction of patients. We are, at such times, called upon to exert our highest intellectual qualities, and to exhibit the most convincing proofs that we have conscientiously employed the period when leisure and opportunity were allowed us of becoming deeply imbued with the principles of our art. Our success or failure in these cases, does not affect us merely as individuals, but brightens or tarnishes the profession to which we belong. Instead, then, of being discouraged at the variety of knowledge, which, under the most favourable circumstances we dare not hope to attain, let us carefully decide on the course we are to pursue; and having decided, press onwards diligently, under the cheering conviction, that if we leave much unattempted, our actual advances are to be permanently and extensively useful.

Anatomy, at all times recognised as of high importance, at present vindicates her claim to an especial degree of your regard, both on account of intrinsic merit, and because of the brilliant rewards promised to her votaries. The improvements which, within a few years past, have imparted so much efficacy and stability to medicine, have

grown immediately out of the study of minute anatomy, and the torch, whose steady flame guided BICHAT through the difficult and almost unknown regions of physiology, has since shed a more ample lustre to enable the pathologist to trace the insidious footsteps of disease with precision, and successfully oppose a barrier to its ravages.

In speaking thus, it is not our object idly to vaunt the superiority or exclusive importance of a favourite study, but in the full persuasion that we shall render you a lasting service if you can be led to appreciate its *true* value. Most of you have read of, and many of you have witnessed some of the extraordinary changes which have occurred in the theory and practice of medicine, *now* no longer what it was even a few years since. *Then*, it was a body of doctrine dependent upon peculiar theoretic views, drawn too often from partial and restricted experience, and the system taught, in great degree, depended upon the ingenuity or eloquence of teachers. *Then* it was almost sacrilege to differ in opinion from the popular leader, whose dogmatical or fanciful absurdities, clothed in all the pomp of words, usurped the place of fact and truth and nature. In that era flourished the sciences of Expectation and Symptomatology, or the arts of waiting for and recording the changeful effects of diseased action, and then abstracting certain aggregations of symptoms or *effects*, as diseases. Thus, substituting the shadow for the substance, and deterring the mind from discovering the actual condition of diseased organs and texture, by occupying it in waiting for the consequences of such disease, which, under proper treatment, would not be allowed to present themselves.

From the time of Hippocrates to the days of Rush,

every leader of medical opinion has attempted to establish a theory of fever. Of the value of these theories, the world has had melancholy experience in their rapid succession, decline, and oblivion. But, the study of the *facts* of fever was left to a much more recent period. The expecting symptomatologist patiently watched by the bedside of expiring humanity, to mark every varying appearance, every fleeting symptom—and thus far merited our gratitude. But when the spark of life was quenched, and the dominion of death began, his study of the disease and his researches were alike at an end. At this point the triumph of modern medicine begins—the voiceless dead are interrogated—and the results already obtained have done more towards the permanent advancement of our science and the interests of humanity, than all the brilliant theories that ever were conceived; than all the eloquence that ever delighted or misled the world! Such being the dawning influence of anatomy on practical medicine, what may we not hope from its meridian splendour? When all the cultivators of our science become qualified to profit by its light, and co-operate in laying bare the processes of diseased action, so long and so unnecessarily regarded as “hidden mysteries.”

We have heard, but it appears too monstrous for credibility, that even at the present day, hundreds, nay even thousands of (so called) physicians, are to be found in this and other countries, who are not only ignorant of our subject, but are not ashamed to avow their ignorance of it—yet still have the presumption to rank themselves among the honoured members of our profession. If such a state of things can possibly exist, then is it no longer wonderful that medicine should be called conjectural;

should sink into insignificance, or be at best a barbarous collection of prescriptions, instead of a body of philosophically deduced principles, qualifying the practitioner to act on all emergencies with energy and efficacy. A practitioner of medicine, without knowledge of anatomy, is a gross absurdity: one might as well speak of honour without honesty, of virtue without chastity, or good breeding without decency. Practitioners such individuals may be, but not of medicine—they are practitioners of routine—practitioners on the credulity and forbearance of mankind.

Much of the apathy exhibited towards anatomy is attributable to first impressions made upon students of medicine at the commencement of their career. They are not only alarmed at the supposed boundless extent, but they are wearied at the apparent dryness of the study. They are taught to look upon it as a sort of mystery which can only be known to the initiated—and they are permitted to remain under such erroneous impressions until it is almost impossible to correct them. All that is wanting to prevent these exceedingly injurious consequences to the profession, is, that teachers of anatomy should know and love their science sufficiently, to display it to their students with proper enthusiasm—forgetting themselves in their subject. They would then convince their hearers, without effort, that all of anatomy at present known, is attainable even to ordinary capacity; that industry, patient persevering industry, is the most essential requisite to success—as before it, every difficulty disappears.

There was a time, it is true, when students and practitioners might with greater reason confess they knew but little of anatomy, because then the minds of their countrymen were enthralled by Superstition and Ignorance; those

fiends, which still, though but in few parts of the world, standing aloof from the light which they hate, grin horrible defiance against those who would annihilate their shackles by seeking after the treasures of knowledge commonly buried in the grave. There was a time when, at the peril of life and liberty, students of medicine stole a trembling glance at that glorious book, which is opened to them in the construction of the human body. But those days cannot again return. Over this happy land, the sun of civil and religious liberty has, for half a century beamed his most cheering irradiations—and the light has not only been shed over the great masses of men dwelling in our fair cities, but has brightly glimmered even through the crevices of the most distant and rustic habitations.

Henceforth, it is our own fault, if the people do not co-operate with us, in advancing the knowledge of anatomy; it is our fault, if we be not permitted, nay invited, to investigate the effects of disease on the remains of those we have been unable to save from death; thus conferring the last and best boon upon their surviving friends in the ability it may impart to the physician to prevent similar evils in others. To effect this desirable end, it is not necessary that the feelings of friends should be shocked; it is not necessary that any thing should be seen by them that could, without close examination, lead to a suspicion that the hand of the anatomist had been there. When once this is generally understood, and the importance of such examination fairly explained, the study of pathology will be extensively improved, and the practice of medicine incalculably benefited. The obstacles which exist to oppose these researches, grow out of various prejudices, and in no small degree out of the supine-

ness of physicians. We have already glanced at the general want of proper notions relative to our subject: a knowledge of anatomy being deficient, the individual grows contented with his routine: he thinks he has done his best, and satisfies himself when all is over, that he could have done no more. But, under other views of duty and responsibility, with a better knowledge of anatomy and an anxious wish to discover the causes and effects of disease, he would take every opportunity during his social intercourse with his patients, and when the fate of no individual was pending, of enlightening their minds on the subject, by teaching them something of the laws which operate to keep the system in health—the effects produced by any loss of balance between the different organs, and the benefit to be conferred on the living by exploring in the dead the changes caused by disease. All men are eager for knowledge; all men thirst after a discovery of the causes which destroy that “mystery of mysteries,” life—all men love their own lives sufficiently to bend their natural affections and associations so far, as to yield us, when properly solicited, the advantages we require. It, therefore, requires only the proper disposition on your part, combined with the necessary degree of knowledge to transcend all prejudice, and serve the interests of the whole human family. If such things can be effected—and they may daily be witnessed—if the members of our profession can exercise such an unbounded influence over the feelings, the weaknesses, the strength, and the prejudices of humanity, why is it that our profession does not rise, as it ought, to be the head and the heart, the wisdom and the glory of our land? not by interfering with the civil relations of mankind, but by exten-

siveness of knowledge, and the irresistible influence of virtue?

Under existing systems of education, much cannot be hoped for, beyond the ordinary results. To comprehend the scope and bearing of all the branches of medical science requires more time than any of us bestow—more maturity of judgment than any of us possess, when we first enter upon professional duty. This is the general defect; the besetting sin of existing systems of professional learning. The student of medicine, as a general rule, does not become properly instructed in the true nature and importance of his situation, until much of his time is lost, and he is too deeply involved in the multifarious business of his studies to discover them. He is not aware that his opportunities of gaining elementary knowledge come but once—and too often he begins the practice of his profession before he has obtained a knowledge of its principles. Years elapse before he discovers all the errors of his commencement, and then he is too entirely thrall'd by business and long-established habit to begin anew. Therefore, the influence he should have exercised upon society is lost—the benefits he can confer are infinitely small compared with what they might have been, and he grows gray in the performance of the same round of daily labour, reckless of change.

Those who are engaged in the study of medicine should, in an especial manner, remember, that it is not only their interest, but their duty, to uphold genius, and reward the talents and industry of their teachers. They should never lose sight of the fact, that their own improvement and the character of the profession should always be to them of paramount consideration. That they should support those

institutions which beckon industry and talent onwards—which prove that they are devoted to the cause of humanity, the interests of society, and the universal diffusion of knowledge. They should patronize institutions which are most in accordance with the liberal and enterprising spirit of the times—such as establish, by their actions, that they consider the general good as well as their own advancement, and vindicate their claims to respect, by teaching students as men seriously engaged in the pursuit of knowledge.

In delivering these observations, do not, for a moment, suppose, that they are intended to apply to any individual institution, or to awaken feeling in regard to any set of men. In the performance of our arduous professional duties, it is a rule that should never be infringed, to know no persons, to support no party—except the persons and party be zealously engaged in the great work of building up the character of the medical profession. Having been, during eight years past, almost uninterruptedly engaged in teaching anatomy, the subject of professional education has always been before our view; upon this topic, it has ever been our aim to speak and write as a free man, engaged in the discharge of an important trust—as one who loves and honours his profession, believing it to be one of the noblest gifts of Heaven to man: as one who feels it a sacred duty to urge you to reflect upon the relation you individually and collectively bear to the profession, to your friends and your country.

Who can say what may not be the consequence when all the rising members of our profession go forth, fully qualified to increase its value, being imbued with high moral principle, and replete with that intellectual supe-

riority which looks down with pity upon the ignoble movements of the malevolent and unworthy—when they look upon their art as the means of blessing society, as well as of benefiting themselves—when they exert the influence which it is their duty to acquire, in scattering around them that taste for knowledge, and that disposition to reward its votaries, which is characteristic of those who love the diffusion of light. Judging by the past, we do not despair of seeing much of this accomplished; and if you will but recollect that *you* owe to society the performance of a part of this great work, its completion may exceed our most sanguine expectations.

Let this possibility be then ever before you, and remember, that the incessant exercise of your industry is necessary to such success. Delay not until life be far advanced—but from the onset, act with direct reference to this vast object—

“——Take the instant way,
 For honour travels in a strait so narrow
 Where one but goes abreast; keep then the path,
 For emulation hath a thousand sons
 That one by one pursue; if you give way,
 Or hedge aside from the direct forthright,
 Like to an entered tide they all rush by,
 And leave you hindmost.——”

CHARACTER AND INFLUENCE

OF THE

STUDY OF GENERAL ANATOMY.

THE noiseless wings of time, wafting us swiftly onward to the infinite ocean of eternity, have again borne to us that season in which it equally becomes our pleasure and duty to offer instruction to such as are desirous of entering upon the arduous and responsible profession of medicine. The feelings of pride and gratification we might experience on an occasion like the present, are subdued by considerations of a more impressive character—by sentiments of more profound and heart-stirring emotion—by reflections of serious and enduring interest. We are about to assume a vast weight of obligation, to encounter the difficulties necessarily attendant upon a great task, with a certainty of being unable to accomplish all that we desire, even when we have effected all that is in our power. The necessity of properly occupying every moment of your time, and the importance of improving every opportunity you are about to enjoy, is strongly before our minds; and therefore, we cannot look forward without experiencing some of that anxious solicitude which must always be felt by men conscientiously eager to discharge a highly im-

portant trust. The generous confidence of youth may induce you to suppose this solicitude superfluous and our difficulties overrated; but experience, the best of teachers, has impressed the conviction upon us too strongly to admit of doubt. Bear with us then, if at the risk of appearing trite we now endeavour to awaken your minds to a sense of the responsibilities you have assumed in commencing the study of Medicine, and to fix your attention upon the importance of the place you are to occupy in relation to your profession and fellow creatures.

Medicine is acknowledged to be one of the noblest, and most important sciences which claims the attention of the human intellect, whether we consider the extensiveness of its utility, the boundless scope it presents to inquiry, or the high talents and moral courage requisite for the acquisition of its principles and the correct discharge of its duties. Derived from numerous departments of knowledge, it is only to be advantageously approached through those on which it immediately and unremittingly leans for support; the success with which it is practised must depend upon the fidelity with which this preliminary knowledge has been sought. Medicine is founded upon an acquaintance with the composition and functions of the various parts of the human body and the multifarious relations of external agents to the general animal economy, or to the particular organs most essential to life. To obtain even an elementary acquaintance with our science, we must invoke the aid of Anatomy, Physiology, Chemistry, Pathology, Therapeutics, Natural Philosophy and a long list of collaterals; and to be able to combine the principles derived from these studies, and apply them practically to our profession demands the exercise of a profoundly dis-

criminating judgment, which can only be formed by the habitual employment of a logic, the most rigid, the most luminous, and refined.

Such being the peculiar constitution of our science, we need not feel surprised that it has slowly arrived even at its present condition, and that few, if any persons have ever attained perfection of skill; the most distinguished physicians who have lived, frequently have borne testimony to their own inefficiency, and lamented their want of that knowledge, which however difficult of acquisition, they still believed to be attainable.

Under such impressions do we at present address you; we believe that the profession of Medicine is susceptible of a degree of improvement equal to the highest wishes of society; we believe the human mind adequate to the task of grasping all the knowledge necessary for the deduction of principles capable of guiding us in every emergency, and we feel assured by the past, that the day will come when the science of Medicine will prove competent to the relief of all our maladies. But before these desirable results can be hoped for, a vast aggregate of ignorance and prejudice is to be removed: some of the most cherished and long-established dogmas are to be set aside, and errors which have passed into general acceptance must be exposed in the clear light of demonstration to the withering influence of contempt.

Entertaining these views, and solicitous to aid to our utmost in the attainment of the desired result, the source of our anxiety on your account is made more obvious. Those who are entrusted to our care, by parents, guardians and friends, come to embrace opportunities of improvement which perhaps may never recur. Upon the faithful

and judicious use of the present time and advantages, your future elevation or degradation may depend; the realization or blighting of the fondest hopes of your friends may follow upon the event of your present diligence or negligence. The conscientious improvement of your time and opportunities is therefore demanded by every consideration of prudence, justice and self-respect: the call upon our sedulous devotion to your advancement is in every particular as urgent and imperative. Fully persuaded that our learned colleagues will amply set before you the importance and usefulness of their several departments, we shall now proceed to give you some views of the character and application of the branch which constitutes our especial charge.

We may consider Anatomy, according to the divisions which have been generally and correctly established by the most approved authorities. 1st. **SPECIAL ANATOMY**, which teaches the individual characters of the different parts of the system, and is made the ground-work of every course of anatomical education, must be carefully studied by all who wish to obtain any satisfactory acquaintance with the philosophy of the construction of animal bodies; it is of the most obvious importance to the physiologist, enabling him to form correct ideas of the powers and movements of the whole machine. It is not less essential to the surgeon in qualifying him to judge of the presence and degree of accidental displacements of parts, which in a great variety of instances are to be discovered solely by those who are specially acquainted with the individual and collective appearances of the structures concerned. But a knowledge of special anatomy does not necessarily convey physiological knowledge—neither does it impart

surgical acumen; an individual who limits his views of anatomy to the acquisition of the forms, number, names, and succession of parts is the least of all worthy the name of anatomist, though he may be a skilful dissector. Special Anatomy is that sort of anatomy which has been longest known and most successfully prosecuted—and it may be learned at all times by the exercise of patient industry, a circumstance which may be considered as especially fortunate. When to this mode of studying Anatomy, the study of the functions of parts is added, it becomes Physiological Anatomy. When the changes induced in structure by disease are investigated it is appropriately styled Pathological or Morbid Anatomy; all of which have contributed in a considerable degree to the improvement of medicine and surgery, though the advances have been exceedingly slow, and seldom renewed.

But a greater impulse was given to Surgery by that mode of study which has been justly called **SURGICAL ANATOMY**. We hazard little in stating that this modification of anatomy has given to Surgery the dignity of a science, instead of allowing it to remain a mechanic art; and better than all, it has conferred upon human life and social happiness an extension and security, which prior to the cultivation of this study, it could not be said to have possessed. Surgical Anatomy teaches the connections and relative positions of the various parts of the frame, with an exclusive reference to the localities examined, so that the surgeon may positively and unerringly know in all naturally formed bodies, where the necessary parts may be found or avoided, or in case of disease to be able to conduct his operations with the greatest security to the patient and honour to the profession. To study surgical

anatomy properly, the student must be prepared to display the greatest degree of assiduity, and exercise the whole power of his observation in order to bear confidently in mind the exact condition of the relations, and be able to judge of their probable degrees of variation in disease. A keen eye, a steady hand, and an unfeeling heart were once thought to be the great essentials in the character of a good surgeon. But surgery is no longer engaged in mutilating limbs nor in mechanical arrangements, since Anatomy has opened to the surgeon a scientific and dignified career. Guided by Anatomy as his polar star, he has a sure support under every trial and is guarded against every danger—accident finds him ever prepared, and even in most desperate circumstances his science enables him to hold death in abeyance. It is from Anatomy that he obtains the intrepid steadiness which conducts his knife, although his face may be pale with intense anxiety for the safety of his patient. The confidence derived from his Anatomical studies imparts the calmness and coolness with which he attends to those who demand his assistance while his country's eagle is screaming over the field of battle and blood. There, though anxious and sick at heart, stunned to deafness by the martial thunder; his soul wrung by the sight of unfortunates too dreadfully mangled to be aided, he is still able to operate with safety, because he bears within his mind that light which alone flows from positive knowledge of the structure and relations of the human fabric. Surgical Anatomy cannot exist where there is doubt. The most absolute and unequivocal decision is demanded—the most perfect certainty is required as to the regular connections and positions of parts—no evasion will serve where the lives

of patients are to be saved or destroyed by recollecting whether a vessel or nerve is to the right or left—interior or exterior, superficial or deep-seated, in reference to parts which are to be the subject of operation.

Surgical Anatomy takes the body as nature formed it, and shows the relations which exist between the different portions. As it is the business of the surgeon to act instantaneously, so it is the business of the surgical anatomist to display the structure of the body in its relation of parts. He destroys nothing to exhibit what lies beneath—he makes no incision that is not to be seen—he separates no parts according to their functions—he can only exhibit them *as they are*. In this way he becomes accustomed to the natural connections, knows what he is to meet with at every successive incision, and is not surprised by unexpected appearances. By thus learning the natural and ordinary relations, he is best prepared to form accurate opinions of the changes produced by disease on the different textures, and can also act more efficiently when he attempts their removal or cure. Surgical Anatomy may with propriety be termed THE ANATOMY OF RELATION. It is indeed the only anatomy that can fix the instrument firmly in the hand of the surgeon, and give to his eye in the hour of mortal danger that steady lustre, which speaks of a prepared and dauntless intellect.

To supply the only deficiency that remained to perfect the Science of Anatomy, was left to that illustrious individual whose short career of life extended to thirty-one years—but who effected in that time what the grayest head might be proud to have accomplished, and what few, even of the young and enthusiastic would venture to think possible. BICHAT, advancing beyond all his predecessors,

laid the foundations of a Science so different from any thing previously known, so pregnant with excellence and immediately tending to the most extensive and progressive improvement of our profession, that in looking upon his works we are amazed at the results produced by a solitary individual. To his gigantic strength of mind and unwearied assiduity the world is indebted for the science of **GENERAL ANATOMY**, and to so great a degree did he perfect the superstructure, for which he laid the foundation, that his successors have done little more than add alterations and ornaments to his original work.

Commencing his researches by investigating the vital forces and their modifications of action in the different organs of the body, he was led to a more thorough appreciation of a hint previously given by **PINEL**, that each peculiarity of structure implied some peculiarity of action, of sensibility, and of life. With a view to the development of this idea he prepared his immortal treatise upon the Membranes, and his memoir upon Life and Death. Confirmed by these laboured and masterly studies in the correctness of his principles he advanced to the composition of that evidence of his surpassing genius, his **General Anatomy**, the object of which we are particularly desirous to make you better acquainted with.

We have in the outset to regret that the use of a term should have led to misapprehension among some of the members of our profession, who from the title **General Anatomy**, have received an impression that it is nothing more than a general outline, or sketch of common or special anatomy, stripped of its minuteness.

Such an idea of **General Anatomy** is totally erroneous, and has in some instances led to the most injurious neglect

of precious knowledge. General anatomy is the science of organization, not of individual organs. It teaches the elementary textures composing all the parts of the body without reference to the specific structures they aid in forming. In this sense alone, it is *general*, but in the determination of the qualities and laws of the elementary textures, and of the manner in which these are linked together, this science is most minute, precise, and definite, bringing us into the most intimate acquaintance with the entire economy of the system, and breaking down the barriers which the habit of exclusively studying special organs, invariably raises around us.

GENERAL ANATOMY, then, is not descriptive or Special Anatomy in outline, but the anatomy of elementary textures, of minute organization without reference to form or place. It is to Anatomical science what Chemistry is to the other branches of natural science. Whatever may be the texture examined, it is considered in all aspects, and throughout every modification, whether it be found in the substance of tendon, muscle, ligament or bone. All its qualities are sought, the distinctive characters established, and the laws of its susceptibilities and actions deduced from the amplest experiments and observations.

The researches of Bichat, led him to think that he could establish twenty-one elementary or generating textures, constituting all the peculiar organs. The labours of his successors have led to the adoption of other classifications by which the number of elementary textures has been advantageously lessened.—These peculiar textures wherever found, are respectively governed by the same general laws, are possessed of the same susceptibilities, and in diseased conditions exhibit similar phenomena. Hence we

may even in the very inception of our subject obtain a glimpse of the pervading influence which such knowledge of the general laws governing the intimate organization of our bodies must exercise upon Medical science. One of the greatest and most beneficial consequences of a proper acquaintance with General Anatomy, is the death-blow given to the notions so flattering to our ignorance, of specific and incurable diseases; and not less important, the termination of the science of bestowing upon *symptoms*, names expressive of some real *entity*, which is called the DISEASE. When once we have learned the General Anatomy of the nervous systems of animal and organic life, and the true character and actions of the vascular system, in its various modifications, we no longer waste our time in allowing morbid conditions to become established, that we may bestow names upon them and apply an ordained or routine course of treatment; but, we trace the action of the offending cause to the part which originally suffered, and guided by the established laws of the healthy texture, we take the surest and speediest means of restoring that equilibrium which is essential to the performance of the vital functions. Under the influence of a proper knowledge of the textures composing our organs, and their modes of vitality, we are secured from the folly of hoping for *remedies*, or specific cures, for supposed specific diseases. We regard remedial agents solely as they are capable of operating changes in the general and special actions of the system—as they influence the great functions of digestion, circulation, and nutrition. This advantage is of the highest importance to our profession, as it leads us to occupy ourselves not with vain attempts to discover remedies for DISEASES, but to determine in what

degree medicinal agents effect changes in specific textures, and in how far they are capable of impressing and controlling the functions of organic life.

Perhaps the improvement of our profession, and the good of our race has been more injured by the prejudices entertained on the subject of diseases and remedies than from any other cause. Not only did the search after remedies lead men from the true path, but such researches tended to the eventual destruction of inquiry by the total darkness into which they led, to say nothing of the extravagances of doctrine which were from time to time sent forth.

Until the period when the science of General Anatomy may be said to have commenced its existence, our profession may be truly declared to have been destitute of fixed, rational principles, and fairly entitled to the appellation of a conjectural art. Without in the least wishing to detract from the merits of the great men who preceded this period, it is undeniably true, that their works are of comparatively slight value, for want of the principles which have since been deduced from the structure of textures and their dependencies of function. Some may feel tempted to exclaim against our rashly judging those we have been taught to revere in medicine: we may be told of the profound and accurate observations of the divine old man of Cos, the Father of medicine; of SYDENHAM, the Hippocrates of England; of BOERHAAVE, no less an honour to human nature than the glory of the medical profession; of HOFFMAN, of CULLEN, and our worthily celebrated countryman RUSH; yet the truth need not be concealed, that it were better for the interests of mankind and the future character of the medical profession, that most of these, and

a host of lesser medical writers should be blotted out forever, than that the works of Bichat should have been withheld.* With no better guides than the old books, we might go darkling along forever, gathering as we advanced a few unequivocal truths at the price of infinite losses of life, and the endurance of innumerable sufferings; but with a science resting upon facts, and not merely of facts, but of such as establish the most universally operative principles, and explain the most complicated and apparently mysterious operations in nature, the condition to which medicine may be perfected can scarcely be imagined, unless by comparing what has taken place since the impulse of this science has been felt by our profession, with what previously existed. If proofs be demanded that these opinions are not mere enthusiasm—look at the bills of mortality since true views of structure and function have exploded the old doctrines of idiopathic fever; since drop-sies have ceased to be regarded as original diseases; since syphilis has laid aside its supposed specific nature, and ceased to require its specific remedy—since the name of consumption has ceased to be applied to all the affections of the lungs, and to most of those of other organs of the chest! Look at the modes of practice generally employed by such as are within reach of the improvements of the

* In saying this, we particularly refer to the direction and impulse given to the Medical mind, by the researches of this great man, whose writings may justly be considered to have the same influence upon Medicine as the writings of BACON had upon general science. Though not containing in themselves the whole of what is necessary to science, yet possessing the germs of vast improvements, and indicating the true course by which future investigators may advance until the desired perfection be attained.

times, although they are too frequently ignorant of the sources whence all their advantages flow, and every confirmation that can be desired for our positions will be found. It is from the establishment of true principles alone, that our profession is to hope for a continued and successively enlarging career of improvement, for however matters of fact may be valuable in themselves, it is only as they enable us to form, or tend to support some general or universal law or truth, that they deserve our especial regard.

Let us for the sake of illustration suppose a case in which two physicians oppositely educated should be concerned.—The one taught to cure diseases, the other only solicitous to preserve or restore health. The one imbued with the doctrines of great authorities from Galen to Cullen; the other well acquainted with Morgagni, Bichat, and Broussais. In short, one a student of medicine according to ancient signification, the other a devoted student of nature in health and disease.

Suppose the learned man of remedies, called to a patient labouring under an uneasiness of stomach, slight heat of the skin; general irritability, a red, smooth tongue, with sourness of stomach and loathing of food, or with capriciousness of appetite, accompanied by constipation or irregularity of bowels. Should this collection of symptoms be named by him *DYSPEPSIA*, he would recollect that this disease is defined to be a state of debility or atony of the nerves of the stomach, a condition of course requiring a tonic and stimulant treatment. The chance is very much in favour of his prescribing a brisk emetic or cathartic to evacuate the alimentary canal; in either case he operates by stimulating the surface of the stomach and bowels.

After this commencement the tonics are administered, and in a great number of instances the smooth, red tongue begins to change to a thickly furred and brownish coat; the surface of the belly becomes tender; the patient loathes and cannot retain his food; his bowels having been stimulated, are more irregular than before; the respiration is hurried, the skin hotter, pulse throbbing, and now he is declared to have *fever*. Here there is something more definite to act against, and another doctrine governs the treatment. Suppose this fever be not so violent as to require blood-letting, an irritating cathartic will very probably be the first medicine administered; this performs its part upon the already irritated surface of the bowels, and the patient by the concentration of action upon the internal surfaces is for a time apparently better. But in a short time his head becomes affected without any very remarkable change of pulse; the eyes lose their expression, and become heavy and dull; the skin hot, dry, and rough; the surface of the belly extremely tender; the tongue grows dark and foul, the mind of the patient wanders; he makes a low muttering noise, as if attempting to complain of some disturbance—and our doctor now very appropriately announces that the patient is labouring under typhoid or typhus fever, according to the degree of these symptoms. Every one knows, according to the books at least, that the typhoid condition is a prostrated condition, and prostration of necessity demands stimulation and support. Then comes wine whey; but the patient is still failing; next porter or wine and water—still sinking—then alcohol in various states of dilution—worse and worse—then oil of amber—castor, musk, sinapisms, blisters, stimulating baths or frictions—and the patient is dead!

If the physician be interrogated as to his ideas of the seat of this *disease* he has been treating, it is a thousand to one that he will talk learnedly of engorgement of the liver, of the lungs or brain, of torpor of the bowels—atony or spasm, or determination to the head, or in short of the whole round of theories according to which he has been taught, in relation to the different *diseases*, he may suppose his patient to have suffered. But it will be perfectly evident to all who hear him thus advance his opinions, that they are hypothetical even to himself, and that he aims in a desultory manner at the explanation of separate symptoms, without reference to any general principle capable of connecting the whole in any definite order of sequence.

We will now suppose the same case to be under the charge of a physician who is somewhat acquainted with the science of General Anatomy and has learned to apply his physiology to pathology. As soon as he observed the state of the mucous membrane of the mouth, the state of secretion from the salivary glands and the condition of the skin, he would be satisfied that the mucous membrane of the stomach was irritated or inflamed to a given degree. The function of digestion being thus impaired and of consequence that of nutrition, he would at once understand why the immediately related functions of respiration and circulation should directly suffer, being all functions of organic life, and deriving their supply of nerves from the same source. This physician would say to himself, here is, as a primary affection, an irritation and inflammation of a mucous texture extending its influence by the direct catenation of the ganglionic system of nerves, to the lungs, heart, brain, bowels, salivary glands, liver and pancreas, and all the symptoms are merely consequences of the dis-

turbance of the functions of digestion and nutrition, and will cease as soon as the original injury is repaired. His first treatment is to withhold from the gastro-pulmonary mucous texture all irritation, by the abstraction of every stimulus, whether of diet or medicine. He draws blood from over the suffering organ, because he knows that the blood is always determined towards the point where any irritation or division is produced; and because he knows that the vessels the blood flows from, over the stomach, are supplied with nervous influence by branches of nerves immediately connected with those branches of nerves which supply the textures of the stomach. The impaired organ itself is saved from additional disturbance by the use of the mildest, least stimulating or nutritive fluids; and by establishing, where necessary, centres of fluxion or irritation upon the extremities of the same texture or upon others, at a distance from the seat of disturbance, this patient's tongue clears off, the secretions of the salivary and biliary glands are established, the bowels act regularly, and the patient is reinstated in health without suffering the terrible ordeal of fever, or falling into typhous conditions.

For the application of the principles of General Anatomy, to the study of pathology and the improvement of practical medicine, the world stands especially indebted to BROUSSAIS, who still lives and devotes himself to the duties of our profession. His views are as little understood, and as violently opposed and misrepresented, as are those of the renowned, indefatigable, and undefeated Dr. GALL, concerning another subject. The doctrines of Broussais direct us to the study of the healthy functions of textures, with a view thereby to follow up their changes or derangements of action, so as to understand how they may be

brought back to the natural condition. It is by this method alone that any true and rational system of pathology and therapeutics can be established; and for this reason—It has been urged against those who would seek in the dead body for the traces of disease, that death has changed all the appearances, and left nothing for the knife to lay bare. Hence the immense labours of MANGETUS and MORGAGNI were comparatively unavailing and inconclusive, and the researches of various other cultivators of medicine, have been in this respect equally fruitless. But the physiological study of pathology—the tracing out of the general and individual laws of the different organs, and functions in a state of health, and applying such knowledge to the examination of changes or interruptions of these functions, removes the defect, and affords an unyielding basis for the establishment of correct inductions. The traces of disarray may be obliterated by death—but as long as the smallest spark of life remains, “the cry of the suffering organs,” as it has been justly termed, can always be clearly understood through the changes and aberration of function, and the practice instituted will not be a series of experiments, but correct applications of well-founded principles. In saying that Broussais has the credit of doing this great work, of laying the foundation of a rational school of medicine, which even during his own existence has done much towards revolutionizing the practice of medicine throughout the world, it is not intended to state that he is the first, or only one, who has thought in this way. The germ of his doctrines may be found in many preceding writers. Their immediate foundation was laid by Bichat. The highly talented BAGLIVI, in his judicious and valuable observations on medicine, fairly broached

similar views. But Broussais was the first to concentrate the scattered rays of light upon this subject, to form a system embodying the principles necessary to a correct study and appreciation of the whole scheme of medicine, and indicate the path by which future inquirers may advance with a certainty of attaining the most desirable results, as nature is the guide throughout. Of Broussais we may declare as of Gall, that many of the details of his plan remain imperfect, because time has not been allowed for sufficiently extensive observations; but of the correctness of the great general principles every candid mind will be convinced by a sober examination of the facts and reasonings upon which they rest. It is a perfectly safe general rule to conclude that those who condemn by wholesale are ignorant. Whenever we hear Bichat thus undervalued, Broussais ridiculed, or Gall abused, we may safely infer that the individual has never read Bichat understandingly—has never attempted to comprehend Broussais' exposition of his own views—nor condescended to read a tythe of Gall's observations—but has taken up the prejudices of others who have acted with equal injustice. It should therefore be a rule with students of medicine, which should never be forgotten, to inquire of every man who inveighs or declaims against doctrines professing to be founded upon a careful examination, and philosophic induction—whether he has ever read the books he condemns—whether he has ever examined the same circumstances and discovered the facts to be otherwise than as represented—whether he is speaking from his own knowledge, or is repeating the arrogant folly of some prejudiced partizan. Should the objector be of this stamp—one of your prejudgers and self-sufficient sapients—you

may pity his pride, vanity, and ignorance, although you may be scarce able to forgive his attempt to impose upon your understanding. If proof were required of the substantiality of the claims of the great authors we have alluded to, they may be found in the fact of their uninterrupted advancement in the estimation of men, notwithstanding neglect, opposition, and misrepresentation.

We are the more solicitous to commend the science of General Anatomy and Pathology to the members of our profession, and those who are but just entering upon professional life, on account of the admirable influence it cannot fail to exert upon their principles and practice, and because so much of improvement is to be anticipated from this quarter. Medicinal agents we have in abundance, and the sciences collateral to medicine afford us every assistance that can be desired in the investigation of the properties of inert matter. It is absolutely correct acquaintance with the structure and function of the various systems of textures that we stand in need of, to enable us to detect the aberrations from the healthy condition, and to teach us how to apply the agents in our possession to the restoration of the lost balance of action.

We may be told that the pursuit of such knowledge is difficult, and its devotees liable to error—that the mind is disposed to revel in theory, and waste its energies in fruitless efforts to generalize from few facts:—but are we to be restrained from seeking after knowledge, because it does not lie obviously before us; or are we for fear, of perchance, going astray, to stand idle and irresolute, instead of endeavouring to discover the path by which we are to be safely conducted to the point we desire? Is it true that the difficulties to be surmounted are invincible?

Is it certain that we have no positive knowledge relative to the structures and functions of the more minute and elementary portions of the body? Is it correct to say that the knowledge accumulated by the various individuals celebrated in our profession cannot be availingly applied to practical medicine? We answer, unequivocally, no. We have as much of positive knowledge in Anatomy and Physiology as in other departments of natural science; we have as much of positive certainty in our knowledge of the laws governing the formation and functions of the parts of the body, as we have of the formation and actions of any agents with which men are acquainted. We cannot explain all the circumstances falling under our observation; we do not pretend to declare that we have the means of arriving at satisfactory conclusions in all cases. But all things considered, we are not worse off in anatomical and physiological science than in various other departments where our advances are limited because we lack the instruments necessary to aid our farther progress, and not from any naturally insurmountable impediment. The greatest difficulty we have to transcend is that of prejudice; and pride comes in strongly to fasten the shackles imposed by the former.*

* "Of all the causes which conspire to blind
 Man's erring judgment, and misguide the mind,
 What the weak head with strongest bias rules
 Is pride, the never-failing vice of fools.—
 Whatever nature has in worth denied
 She gives in large recruits of needful Pride!
 Pride when wit fails steps into our defence
 And fills up all the mighty void of sense.
 If once right reason drives that cloud away
 Truth breaks upon us with resistless day."

If we sit down contented without endeavouring to advance our knowledge of the actions of the system, how are we to justify ourselves to our cotemporaries and posterity for our conduct? It is easy to decry observation—to undervalue experiment, and to inveigh against fashionable follies. But the way to truth, and the establishment of the most admirable principles, is as open to us, as ever it was to our predecessors, and who can tell us that they have not in despite of all difficulties, deduced from careful and legitimately conducted observations, the most extensive and beneficial generalizations or theories?

In the course of instruction we are now commencing, we have no claim to make upon your credulity—we ask no indulgence for opinions—require no exercise of your imagination. It is our business to show you the rare and beautiful construction of the body—to demonstrate to your senses the facts which have been successfully established by the united labours of anatomists, from the earliest time to the present hour. What reasonings or generalizations may be connected therewith, will be submitted to your judgment at the time the structures to which they refer are shown; so that you may at once examine how far the doctrines proposed, are sustained by the facts presented; as well as in how far their influence is to be beneficial or disadvantageous in your subsequent studies. We trust that we shall be able, in your sight, to divest even minute anatomy of the mystery by which it is too commonly, and has been too long involved—show you that there is nothing in structure which may not be laid bare, and rendered comprehensible by a judicious use of the knife—and prove how absurd it is to allow students of medicine to suppose that there is any part, however

small, minute, or deeply seated, which a scientific Anatomist may not expose and explain, without the least delay or premeditation, for the improvement of his pupils.

Nothing should deter you from attempting to acquire for your own use and the benefit of your profession an equal degree of skill, an equal facility in investigating and unravelling the intricate structures of animal bodies. It will certainly require some time and much practice, but it is entirely as certain, that such skill may be attained. To become eminently qualified as anatomists, and by consequence to be more thoroughly prepared for the performance of surgical duties, it is not necessary that the individual should have grown gray amid his labours. VESALIUS had established his fame on a basis more enduring than the pyramids of Egypt, before he had attained his twenty-eighth year.—BICHAT, as we have already stated, had secured the endurance of his memory as long as that of the human race, before he had numbered thirty winters; and numerous other examples might be given, of the early acquisition of illustrious reputation, by the attainment of the most precious, because the most useful knowledge.

To be successful and distinguished in your profession, to secure for yourselves a permanent claim upon the respect and esteem of your fellow men, you must drink deeply at the source of anatomical science. You must make by your youthful assiduity a broad basis for renown, and accumulate treasures of knowledge, which once gained will far surpass in value all other acquisitions, as they cannot be taken from you, nor be depreciated by any vicissitudes of fortune. By spending your time thus advan-

tageously in the commencement of your studies, you are not only lessening all the future toils of your professional life, but are growing intrinsically more valuable to society, which becomes dependent upon you for the highest and most important benefits, in proportion as your activity and zeal enable you to outstrip the common crowd, who are content to substitute formalities for earnest application, and lapses of time, for conscientiously directed industry. Every man who devotes himself sincerely to a laudable profession becomes a public benefactor; how much more so, are they, who acquire a more than ordinary share of that knowledge which serves for the basis of all that is excellent and improving in medicine; which converts the mere physician into a minister of mercy, and enables the scientific surgeon to preserve in life, health and usefulness, valued members of society, who would otherwise be hopelessly condemned to speedy extinction.

Finally, allow me to assure those who are willing to accept of the assistance we can offer in this pursuit after knowledge, that they shall at all times, find us ready to give them every help which an uninterrupted experience, and assiduous application, for twelve years past, may enable us to bestow. Desiring them at all times, to ask for explanations or directions with frankness; to state their doubts or difficulties; or to declare any circumstance concerning which they wish to be more especially and fully instructed. To cherish every spark of industry will be our highest pleasure, as to note every instance of misspent time and inattention will be our greatest pain, though most necessary duty. Responsible to our honoured profession for the conservation of its dignity; responsible to

our country—to yourselves—your parents and friends, and above all, to the allwise and beneficent God, who has entrusted us with talents, to be improved for the use of our fellow creatures, and his glory; we can do no less on such an occasion as this, than remind you, that while the crown for industrious intelligence is bright and never-fading—the infliction for neglect and abuse of opportunities, may be unavailing regret—defeat and disgrace.

ON THE STUDY
OF
NATURAL HISTORY.

THE course of lectures we are about to commence, is rather intended to awaken than to satisfy curiosity relative to studies, rich in every inducement to inquiry, and proffering an inexhaustible store of rewards to such as devote themselves to their cultivation. Abounding in beauties which description can rarely equal, and excellencies which eulogy cannot transcend, they become more attractive when considered as the means of extending our sphere of rational enjoyment, and enlarging our opportunities of usefulness by the improvement necessarily induced. We desire, as far as practicable, to solicit your attention to the study of nature through some of her most interesting works; to excite your wishes to become acquainted with the living beings scattered in rich profusion over the earth, to call forth your admiration at the endless variety of form, the singular contrivance, the beautiful adaptation, the wonderful perfection exhibited throughout animated nature, and thence to win your observation to their habits and manners, the benefits they confer upon mankind, their relations to each other, and their subordination in the system of the universe. These are the objects we would have

in view, but our willingness to produce the result, necessarily exceeds our ability to accomplish the undertaking.

Natural History, in strict signification, includes all the subjects of the animal, vegetable, and mineral kingdoms, an extent not to be embraced by the mind of any individual, since every branch of natural history constitutes a science, having its own laws and peculiarities, and including in itself numerous divisions and subdivisions. The duration and business of human life, no less than the condition of our intellectual powers, forbid the hope of grasping *all* the treasures of knowledge placed within our reach; nevertheless, well-directed industry may secure us inestimable acquisitions, capable of augmenting our own happiness and enabling us to contribute more efficiently to that of our fellow creatures.

Among the first effects of the study of nature, are improvement of our powers of observation, and the certain invigoration of intellect. We cannot properly apply ourselves to the examination of facts, without being led to reason upon their bearings, and discover their actual importance. We learn to estimate realities justly; we feel the superiority of truth over fiction; of fact over supposition; of reason over imagination. The pleasures which flow from the acquisition of knowledge, although not so highly wrought, nor so exquisitely poignant, as those of mere imagination, are more satisfactory—more beneficial—more enduring. Those resulting from the indulgence of the imagination, may be compared to high-seasoned viands, that are used with keener momentary relish, but are followed by exhaustion and distaste to the simple fare which health and safety require. The acquisition of knowledge confers strength in proportion as the efforts

made in its pursuit are vigorous. Every new advantage imparts a new power to triumph over succeeding difficulties—every step forwards enables us to move with increased confidence, and renders us less observant of fatigue. Our ideas expand as we improve—we look upon the face of nature with higher delight, because we have learned to appreciate her beauties; we feel ourselves to form a part of a system which has immediate dependence upon an almighty and beneficent power; we relinquish those little feelings of self-importance which spring from ignorance and an exclusive contemplation of ourselves:—but, in becoming freed from these notions we elevate ourselves in the estimation of our fellow creatures, in the same proportion that we look abroad upon them with more expansive benevolence.

The study of nature, throughout every province of her domain, invites our regard by benefits alone. The mind, fatigued with doubt and anxiety, finds in this study something upon which it may securely rest; its ever active spirit is gratified by the unceasing display of novelty, which can never be much diminished, since the field for scrutiny is boundless. Every variety of disposition may be gratified with appropriate objects of contemplation, however great may be the number who direct their attention to such pursuits.

The incitements to the study of particular branches of natural history are various in each. Though the objects belonging to the mineral kingdom be hidden deep in the bosom of the earth, imprisoned in rocky caverns; to be sought where the volcano has reft their hiding places asunder, or the mountain torrent swept away the covering of their recesses, their importance in the arts and sciences,

to domestic economy and social enjoyment, together with their influence on the progressive improvement of the human race, cause the eager student to brave every difficulty in order to become acquainted with their qualities and value.

The study of the composition of bodies has similar charms and advantages. The chemist is enabled to comprehend and employ the subtlest and most mysterious agents by which we are surrounded. He can separate the constituents of compound bodies, and recombine them in new forms; he can show a few substances composing an almost interminable variety of forms, and acquires such a knowledge of their peculiar properties as to foretell with certainty the result of their combinations in various proportions. Chemistry and natural philosophy furnish us with the most powerful instruments for dispersing the thick clouds of ignorance which have long enshrouded and enslaved the human mind. Aided by these we are no longer terror-stricken, when the voice of the tempest is up, and hill speaks to hill in reverberating thunder. Instead of imagining that we are *then* visited by the judgment of an incensed and vindictive ruler, the student of nature beholds a bounteous and beneficent providence—views him destroying the noxious vapours of disease, purifying the air for the use of his creatures, flinging over earth a freshened verdure, and scattering new odours from every flower!

Upon the vegetable world nature has lavished her adornments with magnificent profuseness. Forms illimitably varied and graceful, the most luxuriant and exquisitely delicate colouring, the splendour and loveliness of vegetable productions give to this department of natural

history an aspect of perpetual smiles. Here every thing is gay, inviting, and free from repulsiveness: the gentlest air steals not over the surface of earth without wafting to the sense delicious perfumes from fruits and flowers; the eye can scarcely rest upon a spot which nature has not beautified and rendered agreeable by interposing a covering of vegetation. The very poisons belonging to this class, like many of the deceitful pleasures of life, are externally decorated with all the richness and elegance that lend enchantment to beauty.

The study of the animal kingdom excites perhaps a deeper and more powerful interest than either of the other segments of this great circle. The beings of the animal world are in great degree formed like ourselves, having the power of voluntary motion, endowed with senses analogous to our own; not fixed in one place to be moved only by accident as the mineral substance, nor rooted to parent earth like the vegetable, but free to rove wherever appetite or inclination may lead. The creatures of this kingdom are among the more immediate and necessary ministers to our comfort and luxury; by becoming better acquainted with their general and individual characters, we are led to the most advantageous modes of rendering them subservient to our own uses; by studying the peculiarities of conformation which suit them to the conditions they are placed in, we acquire a more satisfactory idea of the principles of nature, and gain a more extended knowledge of our own configuration.

When the general principles of construction to be observed throughout animated nature are examined, we shall be not less surprised than pleased to discover, that a perceptible employment of the same means exists in all the

animal tribes, and that a greater or less degree of resemblance to an original type or model, may be traced throughout the variations of animal existence, from the most perfectly organized, down to the lowest in the scale. This observation at a very early period, led to the belief of a chain of existence extending throughout the universe; which idea after various fluctuations has begun to assume something of a more satisfactory and established value, in proportion as the animated world is explored. The farther our investigations are extended, the more thoroughly do we become convinced, that nothing short of Omniscience could have designed the "strong connections, nice dependencies," by which every creature is fitted to its station, and provided with instincts and organs most admirably appropriate thereto. When we continue our scrutiny still farther, observe the gradations of animal existence, and see that not only are the various classes, orders, and genera of living beings different in appearance and conformation, but that each species is furnished with instruments of self-preservation and support, exquisitely adapted to all its exigencies, we cannot but feel awed while endeavouring to form an idea of the wisdom which was not only capable of perfecting to the minutest detail the most helpless, and apparently insignificant of his creatures, but at the same time of preserving the due subordination and balance of each and all to the great system, so as to leave nothing susceptible of improvement—nothing to be changed—nothing that can possibly be amended. We may therefore rest assured, that every permanent variety we observe in the configuration of animate matter has some relation to utility, notwithstanding our inability to discover its use. Instead therefore of being merely sur-

prised or amused at the curious variations of structure exhibited in nature, we should endeavour by careful observation to discover the purposes for which such modifications are designed, and these when discovered will not fail to reward our attention by expanding our minds most satisfactorily, relative to the manner in which the system of nature was originally framed and bound by an immense series of relations, reaching from the smallest atom, up to the precincts of the ETERNAL THRONE!

It has been but a short time since mankind have been willing to learn some of the most useful lessons, one of the most important of which is, the necessity of examining facts before conclusions are formed. Instead of this, it was, and unfortunately still continues, to be too much the habit to form a conclusion or opinion first, and afterwards to seek out facts in support: this frequently led to an attempt at forcing facts to submit, rather than acknowledge an erroneous opinion to have been formed. In consequence of this imperfection in modes of study, we find persons at one time denying inferior animals to be possessed of any mental faculties, and at another, declaring that man himself is little superior to the beasts of the field. The first opinion resulted from the habit of deciding without examination, the second sprung from an equally limited view of facts, which readily establish the incorrectness of the doctrine.

The superior animals are those endowed with the most perfect organization, the greatest number and most perfect senses, and the greatest capacity for improvement. Man therefore, stands at the head of this class in every respect; for although excelled by many animals in some particulars, he yet transcends the whole of the rest of creation

by his mental power, and sways them with a force which they struggle against, or strive to escape from in vain. His ability to improve is neither limited by place nor time; generation after generation may commence where their predecessors ceased from their labours, and the extension of the dominion of intellect be continued in illimitable progression. But the animals of lower rank are circumscribed on all sides; their capacity to learn is exceedingly small; they are at once possessed of all the knowledge they are to enjoy, and without having been allowed to see their parents, are perfectly competent to construct the edifices peculiar to their species, and supply their wants by the same artifices always employed by their predecessors. This peculiar knowledge is called instinct, and is not the result of education—it is distinguished from all the faculties of the human mind in being unsusceptible of improvement, and by being the same in the different races of animals at all times.

The lowest degree of animation is that exhibited by vegetables; the organization of vegetables necessarily varies in different genera and species, but may be stated in general terms as consisting of a series of capillary tubes contained within a bark or rind, and endowed with a peculiar degree of vitality, rendered evident by the formation of a vast variety of singular juices, gums, &c. and by the healing or reparation of injuries inflicted upon their integument or bark. In addition to their growth, flowering, and fructification, vegetables exhibit curious and interesting phenomena, showing various degrees of susceptibility to the influence of light, heat, and other agents, being in this respect analogous to the higher ranks of animated na-

ture, in their ability to respond to the impressions of stimulants, by an increase of the motions of their fluids, and an augmentation of energy in all their functions. On this susceptibility is founded the success with which the agriculturist applies himself to the melioration of soils, by the addition of various chemical agents.

Besides this simple property of irritability, vegetables are capable of certain kinds of motion. Certain plants expand their leaves during the day, and close them towards nightfall; others remain closed during the day, and expand only at night. Motions of this sort may be explained by the changes which variations of temperature induce in the current of fluids passing through such vegetables. But certain vegetables move in a different manner; some gather up their leaves, and finally cause the whole footstalk to withdraw from the touch, as is seen in the sensitive plant; this might be attributed to the temperature of the finger or hand applied to it; but a touch from any body will produce it without reference to temperature. Hence we are obliged to admit that the term *sensitive* is correctly applied to these plants, and that they do *feel*, beyond the action caused by mere irritation. If we wanted evidence of a stronger kind, that a certain degree of sensation is possessed by some vegetables, we have it in the plant called *Dionea muscipula*, or Venus's fly trap, which grows in our southern country. The leaves of this plant are composed of two lobes, which, under ordinary circumstances, lie horizontally, but as soon as an insect alights upon these leaves, or a worm crawls upon them, the lobes rise up and become compressed against each other, so as to catch and retain the aggressor; in this instance we have proofs of an extreme degree of sensibility, capable of discovering the

presence of an insect, with as much readiness as the skin of a much more perfect animal.*

A peculiar motion is also performed by vegetables, for which we are not well able to account, and this is the turning of the superior surfaces of their leaves, or the bending of their stalks towards the light, even where pains have been taken to render this motion difficult. Notwithstanding these circumstances, no one has yet been able to discover in vegetables organs of sense or motion analogous to those observed in the other parts of creation, although the anatomy of plants has received a very considerable share of attention. A vast number of facts similar to those related might be adduced from the vegetable kingdom, to show that vegetables, however low in the scale, are constructed in some respects like other more highly animated beings, and we might even claim for some of them *something* beyond mere sense and motion, though we scarcely feel ourselves authorized to conclude, as some naturalists have done, that they are capable of volition.

Passing to the lowest orders of *animal* existence, we find *motion* to be the first perceptible attribute of life, as the creatures examined are too transparent to allow of our distinguishing any difference in their mass. By continuing and repeating our observations, we find that they are unlike vegetables, inasmuch as they take into their bodies substances for food, and that they grow from within, instead of imbibing nutriment by means of mere radicles. Still many of these creatures exhibit no superiority over vegetables, inasmuch as they are incapable of sensation, and are similar to vegetables in the circumstance of their

* See the recent works of Dutrochet on these vegetable movements.

being capable of growing, or reproducing animals perfectly like themselves, by slips or cuttings from their bodies.

Ascending slightly in the animal scale, we observe the first traces of that peculiar modification of intelligence termed *instinct*. The lowest degrees of this principle are exhibited by the molluscous animals, which, endowed with tentacula or flexible arms for seizing their prey, and with a mouth, teeth, and stomach for digesting their food, are still destitute of head, or any analogous structure. These animals do not feed promiscuously, but exercise a degree of discrimination in the choice of their food. They can change their place at pleasure, whether by the management of a singular machinery attached to their feet, or by causing a peculiar motion of their prickly covering, as in the echini or sea eggs. The only sense which these animals can be said to possess is that of touch; the possibility of their having a limited degree of taste might be inferred from the fact of their eating, but we cannot state it as positively existing.

On examining these animals and others of kinds resembling them in degree of perfection, what circumstance do we find in their organization that is peculiar? It is the existence of a substance extending the length of the animal's body, in some degree resembling a bundle of small threads, having little knots upon them at different points, and to this construction the name of nervous or sentient system is given. As this nervous system is in these elementary animals disposed upon their organs of digestion and life, and as they are not possessed of a brain, BICHAT, a very celebrated anatomist, has named this system the nerves of organic life, or from the little knots before mentioned, the ganglionic system. This peculiar nervous

system in various modifications is found throughout the inferior and superior animals, but in the latter it is combined with another nervous system of very different character.

The nervous system of organic life is found in all those animals which, though destitute of brain, are capable of performing some of the most curious actions, which, studied by themselves, would imply the highest exercise of reason and forethought, did we not know that such actions are performed without reference to reason, and are entirely independent of all influence of education. Such are the actions of the bee in constructing the cells of the comb, of the wasp in gathering the material for the construction of its nest, and in procuring food for its young. It appears that purely instinctive actions depend upon a *necessity*, which is to us inexplicable, unless we attribute them to the laws originally impressed upon the organization of the creatures; how else can we comprehend the various labours of animals for the preservation of an offspring they are never to see, and for whom we shall be at loss to conceive how they could feel any solicitude? Animals whose actions are purely instinctive are incapable of any degree of education; their organization is such as to deny them the means of acquiring knowledge from without, and such knowledge moreover is entirely unnecessary to them, as all their actions are predetermined and unavoidable.

We next ascend to animals possessing along with their nervous system of organic life, another nervous system of very different character. This is a system of nerves distributed to organs of sense and motion, going from the circumference or surface of the body towards the centre, where these filaments, cords or nerves communicate with

a large mass contained in the spinal cavity called the spinal marrow, or with another mass contained in the skull, and known as the brain. This nervous system is comparatively imperfect in the lowest animals possessing it, and is rendered inefficient in a very large number by the horny coverings extended over the whole external surface of their bodies. Yet in direct proportion to the degree of perfection of this system of nerves, have we the animal advanced in the scale of intellectuality, and in the power of acting independently of mere necessity or instinct. By perfection of the nervous system of sensation and volition we do not refer to size of nerves, but to their susceptibility and power of communicating vivid impressions to the brain or common sensory.

The correctness of these deductions are confirmed by the experience of every individual, who has remarked the degrees of education domestic and other animals are capable of receiving. It is well known that the most stupid and refractory of the animals possessing both nervous systems may be brought to form and retain certain associations, whether these be produced by the infliction of pain, or in consequence of giving and withholding articles of food. Learned goats, pigs, bears and horses, are circumstances of daily exhibition. Perhaps some of our readers may have witnessed a still more singular exhibition of the effects of education upon rattlesnakes, dreadfully venomous serpents, exhibited some years since in Philadelphia and New York.

In relation to the degree of susceptibility of improvement, we do not find that those animals which have single senses very acutely developed are most improveable, but those which with a certain degree of sensibility or rather sensitiveness, have an equality established be-

tween their several senses, or where the animal is provided with organs which compensate for a defect of general susceptibility. Thus the hide of the elephant is dense and comparatively insensible, but the extremity of his trunk is an organ of touch of exquisite sensibility, with which the animal obtains the most exact knowledge of the forms of bodies. The eye of this animal is not remarkable for acuteness—yet the aid it derives from the other senses is such as to enable the elephant to comprehend certain objects and distances with great accuracy, and his ear, though not exceedingly acute, distinguishes sounds and their meanings with sufficient precision to discover the variations of temper expressed by the voice of the individual producing them. The *mind* of this great animal has long been admitted by the most sceptical to be of a very considerable rank, and that this creature reasons to a certain extent, or draws inferences from the information communicated by his senses, all the facts recorded of him demonstrate, and most persons have at some period witnessed.*

To say nothing of the history of the dog, of whose degree of intellectuality every one can give evidence, we may refer to those creatures which otherwise we should be inclined, in this view, to undervalue. It is a fact of sufficiently common note, that birds will learn to imitate musical notes, so as to repeat them correctly in the order in which they hear them, and this not like a parrot, merely, but apparently to any degree to which the teacher's patience may extend. Some of them, as our mocking bird, will learn a tune from the human voice or the piano, or other instrument, and will give the music accu-

* See Note at the end of this Lecture.

rately, without attempting to imitate the peculiar *tone* in which it was communicated. This circumstance shows us, that the bird not only possesses the organ of hearing remarkably perfect, but the power of association and memory, for the sounding of a few notes of such a tune is sufficient to cause the bird to repeat the whole at any time. The effect of a peculiar delicacy of hearing in animals otherwise sluggish and insensible, may be witnessed in many of the lizard tribe. We have had the pleasure of observing this effect in various species, and once, especially, in an iguana, a lizard-like animal from the West Indies, in the possession of a friend; this creature was exceedingly slow and helpless in its movements, its natural sensibility appearing to be greatly impaired by the change of climate. Yet, notwithstanding these circumstances, if a few notes were struck upon the piano, or a lady would hum a tune, the iguana would raise its head, and express by its attitude and movements a high degree of pleasure: as soon as the sounds were discontinued, it would resume its former position. This was uniformly its mode of action, how often soever the experiment was repeated. In a state of nature, this animal feeds upon insects, and the peculiar delicacy of its hearing is most probably designed to enable it to distinguish the approach or position of its prey.

The education of inferior animals can go no farther than to the individual; the offspring are in the condition the parent was originally found in, nor can the parent impart any knowledge obtained. This constitutes the most striking difference between our race and the best of the animal creation: they are creatures of instinct, and otherwise governed by sensation alone—man is educated by his senses, and governed by the motives which experience, reason,

and the clearer lights of revelation suggest. The mere animal is the same at all times, and, with scarcely appreciable variations, in all places; man is the child of circumstance, varying in manners in every region, and changing with every clime; capable of altering his habits, and modifying his very nature to accommodate himself to the situation in which he may be placed; always susceptible of improvement, and capable of thinking and acting for future time.

Naturalists sometimes give offence to misjudging individuals, by ranking man as the *first of animals*, as if the statement of the fact that the structure of the monkey is most closely similar, degraded man from his high rank! Many well-disposed persons, acting under the influence of prejudice, have reproached the most excellent men for simply affirming what is true, and ridicule has been heaped upon science, and many persons deterred from gaining an amount of knowledge which would have enabled them to smile in pity upon such ignorant prejudices. This, however, must always ensue while we judge without examination, and neglect facts because opinions have been formed. Whatever may be the degree of pride or prejudice, the actual conditions of things cannot be altered thereby, neither can it make man any thing more than the first of animals, if we refer merely to his organization. No degree of contemptuous disapprobation can make the structure of the monkey less like our own; nor remove the bat from its place as third in the scale of resemblance: and why should any one be offended at the degree of approximation in structure? The same infinite wisdom designed them all; the same omnipotent hand fashioned the whole, nor is the last less wonderful than the first, or less

important in the sight of Him, before whom all beings are as nothing. It is in his intellectual faculties that man stands aloof, superior, sublime; in his mere organization, though beautiful and wonderful, he is distinguished, but not singular—in his mental attributes, he is alone, super-eminent, and infinitely perfectible!

The study of natural history has been in no slight degree impeded and misrepresented by the views which heedless and conceited writers have given; and these inaccuracies are too often perpetuated in our most popular works. One of the greatest evils is the entire misapplication of language to various creatures which are designated as "monstrous," "misshaped," or "deformed," and their movements are described as "awkward" and "clumsy." This is not, and never can be true, in relation to any animal whose limbs and shape are fashioned according to the regular model of his species. An alligator, a sloth, or a toad might be considered as deformed or misshaped, if the human figure were the standard of comparison, or if the judgment were formed by comparing them with other animals we are accustomed to consider as more perfect. But each and all such creatures, judged of by comparison with their own species, may be perfectly shaped, may even be beautiful, and are capable of as much enjoyment as other animals in different conditions. The sloth, whose miseries and wretchedness are so feelingly depicted and compassionately bewailed by sentimental writers of natural history, suffers none of the evils for which they bemoan him. He eats the food nature has fitted him for enjoying; he moves exactly as his peculiar construction allows; his mate is as tender of her offspring, and he seems to have as much relish for life, as other animals, consider-

ed by superficial observers as more highly favoured. In a similar spirit of inaccuracy, we frequently hear the terms "hideous" or horrid "monster" applied to creatures, which, though injurious or destructive, have every right to be considered beautiful, if we have regard to their external appearance. The diamond rattlesnake is dreadful and dangerous when we have once learned its poisonous nature, but if beauty of colouring and arrangement of appropriate covering be considered, its right to be esteemed beautiful is scarcely inferior to that of the peacock. If inaccuracy of language on these subjects, were nothing worse than bad taste, it might be passed over without especial animadversion; but language cannot be thus misapplied without leading to injurious consequences. Because some noxious animals are called *hideous*, *horrid*, or *monstrous*, all that resemble them receive similar designations, and children are thence educated in absurd prejudices, by which they are enslaved throughout their lives, and kept in continual dread of creatures which have not the power, even supposing them possessed of the disposition to injure.

It is the existence of multitudes of such prejudices and superstitions which renders it so desirable that the downfall of fiction should be accelerated to the utmost degree, and the dominion of truth and reason extended far and wide. It is to this end that natural history should be studied—not for the sake of discovering prodigies, or marvelling at wonders, but to learn how to appreciate beings which an all-wise Providence has designed for our use, or which form a necessary part of the universal system. This desirable object can only be accomplished by studying facts without being guided by preconceptions,

and deducing the excellence and comparative rank of the creatures we examine from their actual qualities and characters.

With what different emotions do we behold the face of nature after having qualified ourselves to discover and feel the wonderful wisdom with which all the works of creation are designed, from those experienced when our knowledge is circumscribed to the mere common occurrences of life, or the minute details of any particular segment of science? Far from finding incongruities, or being struck with inconsiderable differences, we are continually tracing gradations of connection and harmony of action—instead of wondering over apparent accidents we seek to discover the unity of design, and advance as our knowledge expands to eminences whence we can take in a more ample and gratifying scope of observation. To the student of nature, thus improving under the influence of a well-directed scrutiny, there is neither uncertainty nor doubt; he has but to look and learn—to examine and be convinced—to contemplate and receive delight. To him it is unnecessary to say that there is one great first cause omniscient and omnipotent—he is satisfied that but one intelligence could have formed, but one power have executed so glorious and perfect a plan. Tell him not that *God is good*, lest he think his informant insane—for he feels that goodness is the brightest attribute of him who breathed life and beauty over nature, and fashioned the most insignificant of his creatures by rules of infinite perfection—he sees that the result of all the movements of his Maker are *good*. Other individuals may, but the enlightened student of nature *never can* forget the omnipresence of Deity—it is every where before his eyes, and in

his heart—obvious and palpable;—it is a consciousness, not a doctrine; a reality, not an opinion, identified with his very being, and attested to his understanding by every circumstance of his existence.*

Those only can tell who have felt the charm that this knowledge imparts to existence—those alone feel the value and the fleetness of time who have tasted of the living fountain of nature, and regret every moment in which some new accession of knowledge is not obtained. To pursue the study of nature correctly is to be never alone—to be ever occupied—to look upon our own condition with humility, yet with gratification—to enjoy the sight of the rejoicings of others—and to regret that through their neglect of the proper means they should inflict upon themselves needless suffering.

The study of nature pursued on a liberal scale, has a tendency to cure us of that dreadful malady of mind, inordinate selfishness. He who passes through life solely engrossed by himself, and his cares may well be compared to one walking through an almost interminable arched way; when he enters, for a short distance there is a glimmer of light and pleasantness—but as he advances he can only see within the small circle imperfectly illuminated by his own lantern; as he approaches the end there is again a glimpse of the light, but the eyes have been too

* It may possibly be urged in opposition to this, that there are even now naturalists who do not believe in the existence of Deity. We have seen a few such; but they were NOMENCLATORS, not NATURALISTS. The difference between the two characters is as great, and as strongly marked, as is that between the "*horse-chesnut*" and the "*chesnut-horse*."

long accustomed to the gloom to hail it with pleasure, or become too feeble to endure it without pain. But the man who regards himself and his cares in the proper manner, and acquires that love for useful inquiry, which so immediately tends to enlighten his mind, and improve his nature, commences his career with delight at its novelty and beauty—continues it with increasing power to comprehend and enjoy the blessings by which he is surrounded, and as he approaches the termination, with an intellect cleared, refined, exalted and invigorated, he is in expectation of entering upon a new state of being, in which he promises himself with justice an infinite extension of happiness in ascending from knowledge to knowledge towards the immediate presence of HIM

“Who sits enthroned in darkness,
From excess of splendour!”

Fears are occasionally expressed that the increasing disposition to study facts, or the realities presented in nature, will lead to the destruction of what is called the poetry of life. Some persons fear that the world may become too wise for its own happiness, and at length have nothing left for its amusement. Such fears however are as groundless as they are unwise; there is slight danger of the world ever becoming so wise as to have nothing left to learn, nor is there much probability that the happiness of human life would be at all diminished if the dominion of imagination were entirely subverted. This dangerous faculty of the mind may be disciplined without being destroyed, and brought to operate as successfully and advantageously upon the materials afforded by nature, as upon

any of the absurd monstrosities which have at various periods been created and canonized by imagination, to the lasting detriment of mankind.

If FRANKLIN, instead of patiently and carefully examining every fact, and repeating numerous experiments, had contented himself with a wild excursion into the vague of conjecture, and in a felicitous description of some delicious day dream—had given us a theory of the identity of the electric spark, and the lightning of heaven, or had indulged himself in fancying how the

“— Sulphurous and thought-executing fires,
'Vaunt couriers to oak-cleaving thunderbolts”

might be deprived of all their terrors, his boldness of thought might have excited astonishment, and his poetic ardour have awakened admiration. Happily for humanity his mind was of a different order, he examined facts and appearances until he was able to deduce the laws according to which they were produced—he went forth to observe, not to prejudge; to reason, not to speculate; and when he winged his air-borne messenger to call the disarmed lightning down to earth, it was with the rationally grounded confidence of the sage, not in the doubt and dread of a random conjecturer.

It is not against the exercise of imagination, but against the abuse of it we object; against the habit of allowing its capricious and unregulated efforts to usurp the place of reason. Were this sufficiently attended to, we should less frequently have estimable, though prejudiced men decrying the study of facts, and exalting what they are pleased to term intellectuality; as if the intellect, even its wildest aberrations, could advance one step, without recurring to

the realities and truths by which we are surrounded. One thing is most certain, the study of the beautiful and interesting objects which the All-good has so lavishly scattered around us, requires diligence and patience, the endurance of much toil, and the necessity of advancing by slow degrees. It is not therefore wonderful that the indolent should decry, or that men proud of their tinsel glitter of imagination, should ridicule. But the student of fact and nature is labouring under high incentives, and aims at a nobler reward; he outlives the memory of his satirists, and the light he kindles is augmented by every votary at the same shrine. The wits and laughers at "sad philosophy," who were cotemporary with Aristotle, the secretary of nature, have disappeared, and been forgotten for three thousand years. The opponents and ridiculers of Newton's patient researches have sunk into irrevocable oblivion. The keen argumentators and subtle disputants who attempted to refute Harvey's doctrine of the circulation of the blood, founded on twenty-six years of close attention to fact and experiment, have all sunk into insignificance; while these sober students of fact have become men of all ages, and will endure until time shall be merged in eternity. The illustrious benefactors of humanity who have most largely contributed to the good of their race, have been disciples of nature, diligent observers, cautious reasoners: they were all men of genius filled with that fire which nothing but death can quench; and all those who have thus been gloriously distinguished and elevated above the common mass of mankind by the good they have done, have with patient earnestness tempered genius by invigorating labour, and reduced the vivaciousness of fancy to an ardent glow of enduring enthusiasm.

NOTE.

Brain of the Elephant.—We have had an opportunity of examining a section of the skull of the elephant, recently so admirably mounted in the Philadelphia Museum, by Mr. TITIAN R. PEALE, a NATURALIST of whom his fellow citizens have just occasion to be proud.

The similarity, in the proportion of the cavities for the anterior and middle lobes of the elephant's brain, to those of the human skull, are strikingly obvious. The great magnitude of the anterior lobes, when compared with the posterior lobes and cerebellum, cannot fail to excite the attention of every competent observer, and would suffice, were the history of the animal unknown, to produce a conviction of the superiority of its intellectual character over that of the generality of quadrupeds. The remark has often been made, that the brain of the elephant is very small, compared with its huge bulk; this remark may have appeared to be of more consequence while the brain was regarded as the *source* of the nerves, than it can do, now it is well ascertained that the nerves *communicate* with, or *terminate* in the brain, instead of being emanations therefrom. Perfection of intellect has nothing to do with size of brain compared with corporeal bulk, but depends upon the *proportions* existing between different parts of the brain itself, and, as a general rule, upon the acuteness of the organs of sense. Where the proportions of the brain are comparatively excellent, as in the elephant, seal, &c. more of *mind* is displayed, although not more than one sense be remarkably good, than in animals having all the senses more acute, with a less perfect arrangement in the proportions of the anterior, middle, and posterior parts of the brain. It is remarked among men, that small, *well-proportioned* heads, display, as a general rule, more of talent and energy, than the majority of large heads, having less perfect proportion between the conformation of their anterior and posterior parts. The difference between the mind manifested by large and small heads, equally well-proportioned, may be stated to consist in difference of activity; the large head being slower in operation, but capable of greater continuance of effort, while the small one is quicker and more energetic, but sooner exhausted by mental exertion.

ADDRESS

DELIVERED BEFORE THE

NATIONAL ACADEMY OF DESIGN, N. Y.

THE sources of rational gratification open to human intelligence, are not less numerous than worthy of the bounteous author of nature, who, far from restricting our condition to that of mere being and suffering, has admirably adapted us to admire and enjoy. Among the most excellent and the purest of our pleasures, are such as result from an observation of the infinite diversity of character, action, and expression, manifested by our fellow creatures under the influence of the innumerable motives caused by peculiarities of moral and social condition. Such, however, is the constitution of all things, that a very short time can elapse before the subjects of attention entirely change, and leave no trace of their existence, except the impression made upon the mind, which is liable to be effaced by succession of novelties. This mutability, it is true snatches from before us sources of unpleasantness, and variety is itself a great cause of pleasure; but it is not less true that the admirable, useful, and excellent, is equally subject to the same law, and without some means of counteracting its potency, the sublimest lessons of virtue, and the loveliest combinations of grace and beauty would be lost and forgotten, as though they had never been. All

that is ennobling and inspiring in human thought and expression, is alike evanescent, and our remembrance of the characteristic appearances they produce, would be as perishable as our own frames, were we possessed of no better mode of recording them than by speech, no more enduring tablet upon which to inscribe them than memory.

Of the fine arts which arose to supply the means necessary to render harmless the destructive law we have alluded to, "immortal verse" may be considered as among the first to commend itself to the attention and cultivation of men. The enthusiastic strains of the poet, elicited by the beneficent actions of the patriot, or the dazzling heroism of the warrior, are poured forth by civilized and savage with a spontaneousness that speaks of the fulness of heart which impels their utterance. Poetic descriptions, moving the mind by melodious combinations of sound to exercises of imagination, excite feelings and ideas highly favourable to the views of their author, whose business it is to evoke passion without descending to minute details, and produce impressions which are the more delightful as they partake of the vast, the vague, and undefined.

To delineate form, colour, and effect, to preserve a correct representation of nature, or to fix the features, character, and expression imparted by passion to humanity, was the work of later periods. The necessity of appealing to the mind through the senses of vision and touch, caused the attempts at pictured resemblances of the pleasing, useful, grand or terrific, and the universal language which productions of this sort spoke, created a demand for the art, and an esteem for artists, which speedily advanced them to a high degree of perfection. Once arrived at a state capable of presenting with a fide-

lity only surpassed by life itself, the graces of beauty, the aspirations of genius, the fire of enthusiasm, the sublimity of virtue, these arts operated upon men in such a manner as to produce the most beneficial consequences, leading to the desire of imitating what procured such high distinction, or of avoiding the conduct of those whom the arts held up as objects of general detestation. Thus the first attempts made to imitate and fix the evanescent charms of nature gradually led to the refinement and perfection of the arts, and the power acquired by the artist of enabling man to triumph over relentless fate, tended to produce a more general desire to merit such a rescue from that "dull forgetfulness," which all men so much and so deeply dread.

The glory of having been among the earliest to arrive at, and the longest to retain perfection in the arts of design, is due to a nation which in such works appears to have accomplished as much as human intelligence is capable of; and the same people cultivated poetry, music, and a variety of allied indications of high intellectual refinement, to a degree rarely equalled, certainly never surpassed. To the efforts made by the Greeks in the prosecution of the arts and letters, the civilized world is indebted for a very large proportion of the improvement which characterizes its present condition, and the splendid examples afforded during her brightest days, embalmed in the immortalizing song of her poets, or lifted above the surrounding wrecks of empires and of matter by her artists, appear to have been highly instrumental in awakening her to struggle again for the recovery of her long-lost place among free and sovereign states. To speak of the surpassing excellence of her ancient artists before cultivators of similar

liberal arts, would be entirely presumptuous, as it must certainly be unnecessary, but it may not be an unprofitable inquiry to determine the circumstances which led to their extraordinary superiority of skill; and to decide whether there is any thing in their success which forbids others to hope for the attainment of similar excellence.

Refined and intellectual in their manners, and dwelling under a happy sky, their modes of dress, amusement, and conversation were wonderfully suited to diffuse a knowledge of all that was beautiful in form and graceful in motion. As in their language the slightest inelegance of expression exposed them to derision, so in their paintings and statuary incorrectness of proportion, or awkwardness of position, were subjected to the severest criticism, even from the common people, who were accustomed to the most beautiful exhibitions of nature in the public games and festivals. They studied nature in her most delightful forms—they admired beauty and dignity of expression, because they were sufficiently instructed to know how to perceive its excellence, and they dared even to personify divine attributes, having thoroughly understood and imitantly portrayed all the high and god-like qualities of man. No one can doubt that their artists, in addition to the possession of knowledge, had added thereto the inspiration of poetic feeling—they produced works for a people prepared to admire and reward; they have delighted and instructed mankind for ages after the nation producing them was stricken off the rolls of sovereignty, and the character of her children debased by an iron yoke.

If we scrutinize the peculiar excellence of the remains of Grecian art, we shall perceive that it consists in the accuracy with which the most beautiful in nature is united,

combined, and wrought out to an aggregate of excellence. That they observed nature closely, is as obvious as the remark is trite, but the manner in which they *understood nature* appears to have been very much if not altogether overlooked. They certainly had excellent models within their command, but their superiority of models is not so great as to give reason to believe that this was a material cause of the extraordinary superiority of their works. Neither shall we with justice attribute to the Greeks a surpassing degree of skill in the mechanical execution of their statuary, especially as we have no reason to believe that in this particular their transcendency consisted. But to us it appears more probable that their great eminence was owing immediately to their thorough comprehension of the manner in which intellectual character and emotions affects all the parts and actions of the body. They observed too nicely not to have perceived that there is no decided operation of the intellect leading to corporeal expression or movement, which is not accompanied by a change in *all parts* concerned in moving the body. The peculiar linking together, or catenation, as we technically phrase it, of all the lesser with the greater actions, the exact co-operation of all the subsidiary parts, and the minute differences produced upon the entire surface consensaneously as they exist in nature being represented, give that perfection to the entire work which no degree of elaboration, however exquisite, could otherwise ever attain.*

In modern productions, we too frequently witness the opposite to this sort of correctness; figures placed in attitudes having but remote connection with the sentiment or

* See Note A. at the end.

emotion the whole piece is intended to represent. A part may be correctly given, while all the others, however perfect if separately examined, are wrong when considered as forming a whole, designed to exhibit certain emotions or actions. In ancient statuary we do not see a figure which is merely of surface and proportions, but an elaboration of surface and an entire accord of action exhibited throughout, impresses on the mind a feeling that the interior as well as the exterior of the mass, has never for a moment been absent from the recollection of the artist. In modern works we see frequent marks of excellence, but even the most excellent are defective in some of the particulars we have alluded to; despite of a very finely finished surface, there is evidently something wanting, which appears to be that nice observation of minute form and consentaneous action, which gives to the imitation an approach to the original in all things except the possession of life.

The observation of the Greek artists extended, moreover, to the philosophy of expression, as shown in the inferior orders of animated nature, as well as in man, by which they were enabled to advance with great correctness in the delineation of mental character as expressed by form. They regarded with nicest scrutiny the particulars in which various animals differed from each other, and from man, and the degree in which the lowest of the human race differed from those acknowledged to be most eminent for talent, virtue, and education. They thus early learned to distinguish merely animal from intellectual expression, and when they ventured to personify the attributes of their divinities, it was by enlarging upon, or apparently exaggerating, the noblest markings of expression, that

they aimed at portraying the superiority of intelligence and command which belonged to their supposed directors of the universe. In this apparent exaggeration of the most excellent of human qualities, and by the perfect observance of proportion and harmony of action, they attained, in the statues of their demi-gods and divinities, to an expression entirely concordant with their design. It is scarcely possible to look at the Apollo, in which is displayed the irresistible strength of immortal agency, without feeling that the artist has contrived to infuse into the form a feeling of entire self-possession, an undisturbed mind, and supernatural power, which could alone belong to a being of the most sublime and unearthly character, against whom opposition would be weak and resistance vain.

The question has often been repeated, why have the Greeks remained so long unequalled, and why have they never been excelled? And from the triumph with which the inquiry is made, it is implied that they were always equally excellent, and that there is something in their success which forbids others to hope to succeed in the same career. Making all due allowances for peculiarities of climate, patronage, and customs of country—all of which acted as powerful incentives to improvement—we cannot help believing that their approaches to perfection were gradual, as is the advance of every thing human, and that a very great multitude of inferior works must have been produced by them, even if we have no other proof than the perfection of those remains which the ravages of time have spared.* The elements of their success is therefore to be found in their close application to

* See Note B. at the end.

nature, so as to understand thoroughly the causes of expression, as well as to define the expressions themselves. Those who succeeded the great masters were satisfied with studying their works, and imitating them as servilely as possible, until at length they became unable to perceive any excellence not to be found in their models. Hence they remained stationary at best, or more commonly sunk below their instructors, and became mere copyists. Even when such artists ventured to study from nature, they as often erred as improved, because they saw things which did not exist, or else neglected those that were visible for want of proper knowledge to decide between the natural and accidental appearances.

The ability to decide between natural or proper and accidental expressions or changes of external form, is of the highest importance to the artist, and requires an accurate study of the instruments of motion, and a knowledge of the manner in which particular habits may affect permanent variations of action. The most perfect model for the artist is only to be obtained from individuals who have not been devoted to any one kind of exertion, or any occupation which calls into activity a special number of organs. Owing to the defects of form and disproportion of members thus produced, it is very rare, if not almost impossible, to find a model from the lower ranks of life, or from among persons laboriously employed. Such as work exclusively with the arms and hands have the members of the body thus exercised increased disproportionately to other parts of the frame. A man whose occupation is that of planing boards, walks generally with the left side of the body in advance of the right, and the left foot pointing inwards; at the same time the muscles of the right arm

and side of the body are stronger and larger than those of the left. Similar observation will indicate the unfitness as models of all those whose occupations are sedentary, and who are variously deformed by habit, according to the peculiar nature of the case. The gradual manner in which such changes are produced, render the actions quite easy to the individual, and might induce the inexperienced to pass over the defect; but an artist properly acquainted with anatomical proportions would detect almost the slightest of such variations from the true model. It is not true that our savages or aboriginal Indians are more natural in these respects—or that they offer perfect models of general and unchanged nature. They differ as much among each other as the whites, and are as subject to the modifications which arise from the influence of peculiar circumstances and habits. The heads of many Indians are commonly erected to a constrained degree, and their gait is equally unnatural. The steps are made so as to keep the feet near together, with the toes pointing directly forward. In all these circumstances the qualified observer will recognize the results of necessity acting on man in a condition where he is continually alert on the chace, or treading cautiously in a narrow and intricate path, or among the undergrowth of a forest.* On such subjects much false criticism would be spared if the critics were possessed of a moderate share of anatomical knowledge, which by reference to the instruments of motion and their centres of action would show them that the carriage of the natural man is often constrained and unnatural, however much it may be by usage rendered easy to the individual. The structure and position

* See Note C. at the end.

of the head, and the form and situation of the muscles by which it is sustained, would convince him that the natural and graceful figure of the neck is destroyed by forced efforts to keep it in a line with the trunk, and that Phidias was true to anatomy, to expression and to nature, when he gave to his majestic personification of the "Cloud compelling Jove" the degree of curvature of neck, which bespeaks at once ease and grace combined with dignity and power.

The modes of life which allow unrestrained development to the body and limbs, and varieties of exercise which call forth an equal degree of activity and enlargement of the instruments of motion are alone capable of producing good models for the artist. This it is which constitutes the peculiar ease and freedom of motion which characterizes men who have been well educated, and whose frames have never been drawn into any special habit of action, by application to laborious pursuits. All the muscles are proportioned in their size and action, and all the movements participate in the same ease; a peculiarity which no artifice will enable an individual to attain, who has not thus been trained. It is well known that no aid from the tailor nor hair-dresser, no costliness of material of which drapery may be composed can conceal the want of that "something" which constitutes the peculiar ease of a well educated and judiciously exercised individual. The something which is improperly called indescribable, anatomists know to be a want of proportion and equability of action between the various parts of the skeleton and moving apparatus of the body.

An artist who has acquired a proper knowledge of anatomy would avoid a great many errors, into some of

which eminent men have fallen, such as the exaggeration of muscularity at the expense of all proportion; and the use of attitudes which no human being could possibly assume. Some such extravagances have occasionally originated with men well acquainted with anatomy, but who have studied it too technically, or rather have chosen to display anatomical knowledge without reference to nature, expression, or reason.

The anatomical knowledge requisite for students of the fine arts, is of very different character from that which is essential to the formation of a physician or surgeon. The artist wishes to know the external surface thoroughly, so as to distinguish the fixed from the moveable, the changeable from the permanent. It is therefore necessary for him to know the general characters of the bony framework, and the joints connecting the different bones; the points of these bones which are only covered by common integument, and the parts which give attachment to the muscles or moving organs. He must be able from studies of this kind, to distinguish between the prominences of the surface which may be temporarily changed by muscular energy, and those which owe their variations to the accidental conditions of surrounding parts. It is not necessary to go through as much of toil in acquiring this knowledge as a student of medicine would be obliged to undergo in pursuing his elementary studies, but his improvement will be the greater if he advances beyond these general investigations concerning form and outline, to obtain some information relative to certain great physiological subjects of much importance. Thus the painter who has learned as much of anatomy as we have already referred to, would derive great benefit in his colouring, from having studied the

great processes of digestion and respiration, upon which the colour of the body is so immediately dependent, and which certainly could be better represented by an artist acquainted with the manner in which the colouring was produced, than by one who only regarded the skin as a surface having no connection with any peculiar operation of nature. An artist may have a general notion that the expression of countenance is very much connected with that of the eye, and he may occasionally hit off a resemblance to the organ without being well aware of what he has done. But a painter who has examined with care the connection of the parts of the frame, and who knows how the passions of the mind provoke the heart to increased vigour of exertion, and how the purple tide is sent gushing to the brain and eyes during the excitement of feeling, will surely be better able to comprehend, to seize and fix correctly those vivid glances which tell of the predominant emotion—the mild eloquence of pity—the fervid beamings of love—the fierce dark glare of anger—the steady ray of fortitude, or the dancing light of joy. A skilful observer who had acquired this sort of ability to trace the changes to their proper source, would not be long in learning how to discover the leading character of his subject, and turn it to the advantage of his art, by reproducing the peculiar expression in the individual, until he had secured it in enduring colours.

We might continue to descant upon the advantages which anatomical science would confer upon the fine arts, until both speaker and hearers were exhausted. But this is unnecessary, since it is sufficient for you to acquire a little of this knowledge, to make you desire more; as of all the

means of exercising and gratifying an inquisitive mind, the study of animal organization is among the best.

We have thus endeavoured to point out in a brief and hasty manner, the origin and influence of the fine arts—mentioned some of the causes which led to the perfection of the Greek masters—and referred those emulous of such distinction to the fountain head, nature, for the means of aiding their laudable efforts. If we were not speaking to those who know how to overcome prejudices and disgusts, which would have long since been banished but for the influence of ignorance—we should hardly venture to request them to gaze upon the clear but awful light that streams from out the sepulchre, and extinguishes in its steady radiance, the false and feeble glimmerings of superstition. Thanks to the progress of truth, of science and the arts, the light emanating from this source is no longer lost to man. Thanks to the free institutions of our country, and the liberal spirit of the age, we are permitted for the sake of the living to interrogate the dead; to search amid the wrecks of created beings for traces of the Divine Creator's wisdom; to extract from perishable matter the proofs of the soul's immortality; to collect new truths for the enrichment of science, and gather together precious suggestions for the use of those whose business it is—

“To wake the soul by tender strokes of art,
To raise the genius, and to mend the heart;
To make mankind in conscious virtue bold,
Live o'er each scene, and be, what they behold.”

NOTES.

A—See page 138.

In illustration of what is meant in the text, we take the liberty of subjoining a criticism of the celebrated anatomist JOHN BELL, on the statue of the *Dying Gladiator*, one of the master-pieces of ancient art. Perhaps a more admirably qualified examiner never attempted this task; some idea may be formed of the strength and depth of his enthusiasm from his "Observations on Italy," whence the following passage is obtained, written during the latter days of his life, while suffering under a mortal and agonizing disease. Of a nervous and irritable temperament, his sensibilities were always exceedingly acute; possessing an energetic and comprehensive mind, he early felt, and forcibly taught the grandeur and importance of the science upon which all professional excellence is founded; inspired by a brilliant genius, which was sustained by classical education, he formed and elaborated a refined and discriminating taste, which enabled him to adorn all his compositions by a style equally attractive from its felicity and eloquence. In addition to his other advantages, Mr. BELL was himself an artist of no ordinary pretensions, as may be seen by the anatomical drawings and engravings which illustrate his works, a large proportion of which were from his own hand.

"THE DYING GLADIATOR, a most beautiful and precious work, and of peculiar interest, as bringing so forcibly into evidence the power which the art of statuary may possess of touching the heart. I have gone daily to view this fine statue, and still behold it with renewed feelings of admiration and sadness. There is a curling up of the lips, as if the languor and sickness of expiring nature had confused the sensations, and convulsed the features, that almost suggests the idea of paleness. He has fallen, he raises himself upon his right hand, not for vengeance—not to resume his now useless weapon—not to appeal to the people. No; he looks not beyond himself, he feels that the wound is mortal; he raises himself for a moment on his yet powerful arm, to try his strength; but his limbs have the trailing, bending form of dying languor; he looks down upon his now useless weapon, and blood-stained shield; he is wounded, his limbs have failed, he has staggered and fallen down, and has raised himself for a moment to fall

down again and die. It is a most tragical and touching representation, and no one can meditate upon it without the most melancholy feelings. Of all proofs, this is the surest of the effect produced by art. He was a slave, he had no family, no friends, he was bought with money, and trained and devoted to death. It is then all the singleness of death and despair you are to feel. No picture of tragic effort is presented, it is one impression, and if any artist has ever given that one impression, it is the author of the Dying Gladiator. The design is in this sense finer than any thing in statuary I have ever seen, and given with wonderful simplicity. It is a statue, which, like those of Michael Angelo, should be placed in a vault, or darkened chamber, for the impression it makes is that of melancholy. Although not colossal, the proportions are beyond life, perhaps seven feet, and yet from its symmetry it does not appear larger than life. The forms are full, round, and manly, the visage mournful, the lip yielding to the effect of pain, the eye deepened by despair, the skin of the forehead a little wrinkled, the hair clotted in thick, sharp-pointed locks, as if from the sweat of fight and exhausted strength. The body large, the shoulders square, the balance well preserved by the hand on which he rests, the limbs finely rounded, a full fleshy skin covers all the body, the joints alone are slender and fine. No affectation of anatomy here, not a muscle to be distinguished, yet the general forms perfect as if they were expressed. The only anatomical feature discernible, is that of full and turgid veins, yet not ostentatiously obtruded, but seen slightly along the front of the arms and ankles, giving, like the clotted hair, proof of violent exertion, &c.

“The singular art of the artist is peculiarly to be discerned in the extended leg; by a less skilful hand this posture might have appeared constrained; but here true to nature, the limbs are seen gently yielding, bending from languor, the knee sinking from weakness, and the thigh and ankle joint pushed out to support it. The gouts of blood are large and flat, hardly attracting attention, and do not spoil the figure. If the attitude had been studied, and the posture represented as an appeal to the passions, or if he had been made to die as gladiators were then taught to die, for effect, the statue would have been spoiled; had he been raised so as to look up in a beseeching attitude to the people, or to the victor, it would have been but a poor and common statue.”—*Bell's Observations on Italy*, p. 329.

B—See page 140.

The researches made towards the conclusion of the last and throughout the present century, in Egypt and the adjacent regions, reduce it to a positive certainty that the Greeks were but *improvers* upon the labours of the Etruscans, Egyptians, &c. The germ of all their architectural perfections have been discovered and delineated in the works of Denon, Belzoni, and others, without even excepting the beautiful Doric column or far-famed Corinthian capital, both of which exist in Egyptian works of unquestionable antiquity, in so perfect a condition, as to need but slight variation to give them their present form. The sculpture and drawings saved from Etruscan ruins, show with equal clearness that the Greeks were preceded by people among whom the fine arts were in a very advanced state of perfection, and that to this circumstance, added to the favouring influence of their institutions, climate, &c. their excellence is attributable. Hence there is nothing to prevent others, under equal advantages, from attaining as high a standing in the arts of design.

Artists who desire to convince themselves of the correctness of the foregoing induction, are especially recommended to examine the works above mentioned, as well as the beautiful collection of engravings of Etruscan and other ancient works, published not long since in Paris, which will not fail to delight and convince them. The highest hopes are indulged relative to the results to be obtained by the Egyptian expedition, at present acting under the direction of the distinguished and indefatigable CHAMPOLLION, whose researches have already dispersed the darkness of accumulated ages.

C—See page 142.

The aborigines who have long inhabited the vast prairies beyond the Mississippi, and whose principal exercise is horsemanship, appear to be quite free from the defects of figure so observable in other Indians. Their muscles are finely and equally developed, their frames, though robust, remarkably well proportioned, and their movements almost uniformly dignified and graceful. Perhaps a finer model for a sculptor or draftsman might be selected from among the Osages, and other similarly situated tribes, than could be found among civilized men.

MECHANISM
OF THE
HUMAN BODY.*

THE difference between the present and former times, is very strongly indicated by the character of the investigations which now command general attention. Ignorance and prejudice no longer are permitted to withhold the ardent inquirer from seeking truth in every accessible situation; we now examine not only the most curious results of human ingenuity, but fearlessly scrutinize the most wonderful productions of nature, following her through her most secret recesses, and unveiling her most hidden operations. The last obstacle is surmounted, when man dares to investigate the wonders of his own conformation; when he subdues the repugnance and timidity inspired by early education, in his ardour to learn the secret of his superiority over other animals; when he triumphs over death, by learning at his hands the wonderful instruments that give to life all its beauty and usefulness; when he rises to a more enlarged acquaintance with the Creator, by studying the being in which the perfection of creative energy is displayed.

Among the circumstances best suited to awaken inte-

* Delivered in the Franklin Institute.

rest in the minds of members of a mechanical institute, must be ranked the mechanical contrivances so numerous and obvious in the animal machine. Wonderful as the structure of the human body is, our admiration cannot but be increased by perceiving that there is nothing anomalous in its modes of operation; its mechanical arrangements are in perfect analogy with known principles; its actions result from the application of known powers, and according to established laws. This great peculiarity is, however, to be observed; the instruments operating the various movements of the human body, are endowed with a quality beyond their mere construction, and can produce their effects without external aid. In other words, they are endowed with *life*, have within themselves the means of repair and renovation. In addition, the animal machine has a superiority over every other contrivance, which is to the highest degree admirable. This superiority arises from this fact, that there is scarcely a particle of our frames that is not subservient to various processes, without in the least interfering with the purpose for which it is most especially designed. These subserviencies of single parts to various offices are so effected, that the beauty and excellence of configuration is augmented, at the same time that the additional service is obtained.

The solid frame-work of the human body is very strong and durable, yet it is an interesting fact, that this strongest part of the body, intended for the support and protection of all the rest, is the last part perfected, being rather moulded to suit the soft structures, than the latter to suit the peculiarities of the bones. In the early stages of existence, the bones composing the skeleton or frame of the body, are represented by a soft model, which, as the

animal advances towards maturity, is successively changed from jelly to gristle or cartilage, and eventually to hard and solid bone. The advantages arising from this peculiarity are, that the soft rudiments of bone allow of the birth of animals with the least possible injury to the parent or itself, and the slowness of solidification after birth gives to the senses and instruments of motion, a better opportunity of acquiring that gradual education, which is all-essential to the comfort and safety of the individual. When the bones have acquired their full strength and solidity, all the other parts are in the fittest condition to act upon them with advantage.

The hardness and strength of bone is altogether owing to the combination of earth with the animal matter which gives it various figures, or to speak plainer, the interstices of a spongy cartilage are filled up by phosphate of lime, the hardness or softness of different bones or parts of the same bone depending on the quantity of the earthy ingredient. This every one may very easily and satisfactorily verify. If a fresh and solid bone be burned for a time in a hot fire, it is reduced to quick lime, which though it still retain the form, has lost all the density and tenacity of bone, being so light and friable that it may be reduced to powder by the pressure of the hand. This shows us that the strength or tenacity must belong to some other than the earthy ingredient. If we take another fresh bone and soak it in diluted aqua fortis for some days, the acid will dissolve and remove all the earthy matter, leaving the figure of the bone as perfect as before; but instead of being *hard* and unyielding, it is now soft and flexible, may be twisted in any direction, or be cut or torn with the greatest facility. Under ordinary circumstances, the

decomposition of bone does not rapidly occur after the death of the body. It is to this comparative indestructibility that we are indebted for the very interesting proofs which are from time to time obtained, that certain great animals once existed in large numbers, and have become entirely extinct; their skeletons, exhumed in various situations, being the only trace left of their having once inhabited the earth. But for this durability of bone, we should never have been aware that a larger land quadruped existed than the elephant, nor a larger reptile than a crocodile; yet this circumstance has secured to us the skeleton of the gigantic Mastodon of America, and the enormous Ichthyosaurus, which must have been a reptile about sixty feet in length!

The bones, while they form the frame-work upon which all the soft parts are arranged, at the same time protect various delicate and important structures essential to life. Thus the bones of the skull externally give support to the muscles belonging to the face, &c. and constitute a strong wall of defence to the great organ or instrument of thought, the brain. This it does not so much secure by the peculiar density or strength of individual parts as by the admirable manner in which they are joined to form a whole. If we examine a skull attentively, we find that every segment presents the arched form; this is well known to be a construction capable of offering the most effectual resistance to external pressure or violence of every sort, and experience teaches that nothing short of extreme violence is able to overcome the resistance offered by the skull, and that none of its bones, singly, could sustain half the force required to injure them, when combined in this form.— This mode of arrangement is not merely employed in the

general covering of the brain, but in all the details of the formation of the skull. Thus, in the orbit of the eye, in the roof of the mouth, the junction of the cheek and temple bone, we find a series of smaller arches, all adding to the general strength without the slightest deviation from appropriate symmetry. The arch is also employed in various other parts of the skeleton, wherever great strength is required without increase of the mass of bone.

The chain of bones, twenty-four in number, composing the back bone or spine, serves a great variety of purposes besides allowing the necessary motions of the head and trunk of the body. Through the cavity formed by the openings traversing these bones, the great nervous cord called spinal marrow is extended in safety to the extremity of the trunk, sending off numerous nerves to different parts. At the same time the joints of the spine serve as fulera for the action of muscles which sustain the body in an upright position, and also aid in protecting the organs within the chest and belly. The ribs, which are jointed with the spinal column by regular hinges, form a large half arch on each side, which gives figure to the superior part of the trunk, advantageous points of support to the muscles moving the arms, &c. and protection to the noble organs within, the heart, lungs and stomach. Add to this their immediate importance in the function of breathing, which is effected by their elevation and depression, giving the vivifying air access to the lungs for the purification of the blood.

The parts of the skeleton are bound together by strong bands or ligaments of a strong fibrous substance. These ligaments are uniformly in proportion to the character of the movements to be performed by the joints, and their

exposure to accidental injury. Thus the joints of the back, those of the knee and ankle, as well as other parts, are supplied with numerous and powerful ligaments, while the shoulder and elbow joints, &c. can scarcely be said to have any, in comparison, deriving their peculiar strength from the arrangement of the muscles, bones, &c. To protect the bones subject to much motion still farther, nature has resort to other means—the heads of the bones are beautifully tipped with a remarkably smooth and elastic cartilage, and to facilitate their rolling or sliding upon each other, a soft and slippery fluid exudes into the cavities of joints, which enables them for many successive hours to sustain every variety of motion, and some of them the whole weight of the body, without suffering the smallest injury. In situations where motion is more frequent, and of a character to produce greater wearing, this is prevented by the interposition of a regular friction wheel. Thus, between the articulating process or jointed surface of the lower jaw and its receiving cavity on the base of the skull, a thick piece of moveable cartilage is placed; a similar construction is found between the ends of the collar and breast bones, and between the thigh and leg bones, at the knee joints.

It has been stated that nature employs the same principles in moving the body, as are employed by mechanics in effecting various motions; we shall see this especially exemplified in the mode in which the moving power operates on the bones which are the levers and fulcra. The red, stringy, or fibrous substance, commonly called *flesh*, to distinguish it from fat, &c. is possessed of very singular properties. It is made up of bundles of fibres or threads, arranged variously in different situations, having one ex-

tremity attached or adherent to a fixed or comparatively fixed part, and the other either directly fastened to a moveable point, or mediately by a tendon or sinew. These fibres, or muscles, are able to shorten or draw their extremities forcibly together; they are then said to contract, or to be in action. It is by this contraction that the motion of bones, &c. is produced. The bone is a simple lever, and the weight is moved according to the principle which would govern a similar lever in the hands of a mechanic.

What at a superficial view may appear strange to mechanics, is that nature should in a great majority of instances prefer the lever of the third order, that in which the fulcrum is at one end, the weight at the other, and the power applied between them. But this sacrifice of power is compensated by the greater degree of symmetry of the whole body, which otherwise could never have been attained. Various other secondary and highly important compensations, such as the protection of vessels, nerves, &c. will suggest themselves to every reflecting mind.

In moving the bones and other parts by the agency of muscular contraction, we find the mechanical contrivance of the pully frequently employed, and in several beautiful modifications of arrangement. In the socket of the eye there is a long straight muscle, which rises like the other four straight muscles at the back of the orbit. The use of the last mentioned muscles is simply to move the eye upwards, downwards, outwards, or inwards, but the long muscle we are treating of *rolls* the ball of the eye on its axis. Instead of passing directly to be attached to the eye, it goes through a beautiful little ring of gristle, situated under the projection of the orbit nearest the nose. Hence it turns downwards and is attached to the under

part of the eyeball, and when it contracts produces the action above stated. The soft palate is tightened transversely by the action of two muscles, which could by no means produce this effect, had they not the line of their action changed by passing over a pulley formed by a projecting hook of bone, designed for this purpose. We find pulleys at several joints formed by the interposition of a small mass of bone, such is the knee-pan, the largest, and the sesamoid bones of the thumb and great toe, the smallest of these pulleys. By their situation in the tendons of muscles, they change the line of motion and modify the actions produced. Throughout the body, a still farther attention has been given to prevent loss of power from irregularity of muscular effort, by binding each muscle down in a strong fibrous sheath, to secure the occurrence of its contractions in the appropriate direction.

By the combined action of the muscular system, the trunk is kept in the erect position, notwithstanding its centre of gravity is in front of the centre of the body. This, we shall presently see, is an admirable provision, for when we lose our balance, and are thrown forwards, we almost universally save ourselves from severe injury by throwing forward and receiving the shock on our hands. If the centre of gravity were behind the central line, we should be in perpetual danger of destruction from falls, which we now regard as trifling. The muscles sustaining the trunk are continually varying their actions when the body is upright, in order to bring the centre of gravity within the existing base, which we have the power of changing at pleasure by changing the position of the limbs. We may, on steadily regarding an individual who has been some time standing still, unsupported, perceive

the continual tendency of gravitation to throw the body forward, counteracted by muscular efforts, which being incessantly slightly relaxed and renewed give the body a gentle swaying motion backward and forward.

Let us now particularly examine the manner in which this arrangement saves the body from the violence of falls, &c. The head, trunk, and superior extremities, by the intervention of the spine, rest on the basin and lower limbs. Between the head and termination of the moveable spinal column, there are twenty four joints or pieces, with interposed elastic cartilages. Between the extremity of this column and the toes, counting the joints of both limbs, we have six great joints, and the small ones of the toes and instep, amounting to about twenty-seven. In like manner the upper extremities are united to the rest of the body by eight great joints and about fifty-four smaller, of the wrist and hand, all susceptible of a certain degree of motion. When the body is thrown forward, so as to be received on the extremities, the number of joints between the parts receiving the shock, and the vital organs, is so great that their elasticity, and reaction against the force are quite sufficient, in a vast majority of instances, to prevent serious injury. Every one knows how dreadful are the effects when the body falls directly backward, so as to receive the shock immediately upon the head or trunk. Men, even when they have brutalized themselves by intoxicating liquors, until utterly unable to direct their muscular efforts, or sustain themselves while standing or walking, are indebted to this arrangement for their safety. We see the miserable drunkard hurrying along, and apparently making ridiculous efforts to run when scarcely able to stand; this, however, is involuntary, his body is conti-

nually disposed to fall forwards, and he tries to avoid the fall by suddenly changing his base, since the muscles of his trunk are unmanageable. When he eventually falls, it is forwards, and his extremities receive the shock with slight injury. It is often remarked, that these degraded wretches escape unhurt in a surprising manner, and it is owing to the circumstance just explained and to the general relaxation of the muscles, which permits the body to double up closely on itself in falling, or rather sinking to the ground.

It is owing to the facility of arranging the superincumbent parts to suit the present position of the lower extremities that we are able to balance the body in the most perilous situations, and work with ease and security, where otherwise we should be liable to immediate destruction. The same cause enables various mechanics to use their tools to the greatest advantage, and gives to the sledge of the smith, the axe of the carpenter, and the mallet of the ship-builder, a force and accuracy not otherwise to be gained.

The joints of the skeleton are constructed on principles similar to those used by mechanics for making moveable connections. The joint between the head and first bone of the neck is a simple hinge, moving backward and forward. The first bone of the neck is joined to the second by a *pivot* or *swivel*, which allows the head with the first bone, to turn on the second, laterally, in half circles. The shoulder-joint is *universal* in its movements, and constructed on the common principle; the elbow-joint is a simple *hinge*; the radius or upper bone of the forearm is jointed to the ulna as a *spindle* working *in a bush*; the

hip-joint is a *ball and socket*; the knee, ankle, and other joints, give various modifications of the hinge.

This is a very imperfect sketch of some of the more obvious mechanical arrangements in the animal system. When we have prepared ourselves for the investigation by a regular approach to the subject, we shall be equally surprised and gratified to observe that in the circulation and distribution of the fluids necessary to the economy, the laws of hydraulics, &c. are as freely employed as the mechanical powers of which we have been speaking.

All this curious and beautiful machinery of the body, you clearly perceive to be planned with a view to the perfect action of the whole, as well as of the individual contrivances, and therefore to mechanics, who *know* that *machinery* is not made by CHANCE, it is hardly necessary to insist that *this* must have had a MAKER, and that from its wonderful adaptation and perfection throughout, he could not have been less than all-knowing and almighty. To such of you as wish to extend your views on this subject, and comprehend the plan observable in all animated nature, allow us to recommend a perusal of Paley's *Natural Theology*;* you will perhaps find in that work much

* It is exceedingly unfortunate that many are deterred from reading this admirable effort of human intellect, by the last word of its title, which has from some cause or other become associated with the odious term "*Priestcraft*." Perhaps such persons will have less difficulty in overcoming their repugnance to the title, if informed that Cicero, a *pagan*, has a treatise on the same subject, and that Paley appears to have derived the idea of his work from the treatise "*De Natura Deorum*," since he sets out with some of the same arguments, and arrives at the same conclusion. It is scarce necessary to add that a comparison of the two works is infinitely to the advantage of the modern author.

that we have said on this occasion; for although many years have elapsed since we perused that book, and at the time we were but slightly acquainted with anatomy, it produced so deep an impression as to render it almost impossible for us to speak on the same subject, without appearing to borrow immediately from its pages.

VALEDICTORY.

IF there be any one entitled to feel some self-gratulation, on the discharge of high duties, or at liberty to express an honest pride in the accomplishment of an arduous undertaking, it is surely the student of medicine, at the conclusion of his severe winter's labour. How few have any idea of the toils and privations he is subjected to! How few can imagine the amount of work he is obliged to perform; and how extremely small is the number of those, who, during his subsequent professional life, are willing to take into consideration the immense exertions he is obliged to make, while acquiring the elements of his science. But, there is a satisfaction derived from the consciousness that we have thus struggled to secure knowledge, and expended time, health, and money, to prepare ourselves for relieving the sufferings of our fellow creatures, which none of us would willingly forego. There is no one, who has thus acted, who is not happy to appeal to the manner in which he has discharged these duties, as to an ample earnest of the steadiness and devotion of his future professional exertions, and as an evidence of his continuing stability and faithfulness, in the trusts which may be confided to him.

The day has arrived when some of the relations existing between us are to cease, and though it is a source of gratification to believe that we have received some mutual be-

nefits from our recent intercourse, and reciprocally imbibed sentiments of esteem and regard, which are neither to be effaced by change of situation, distance, nor time;—we cannot avoid feeling profoundly, that our performances have by no means equalled our wishes; that but a small part of our allotted task has been thoroughly accomplished, and that much has been left entirely unattempted. The recollection of your kindness, and the confidence you have reposed in your teacher, will, however, unceasingly urge him to render himself more worthy and prompt to augmented exertions; while the thoughts of your indulgence during the past, will aid him to anticipate the future with less solicitude, and with fuller hope of becoming more amply qualified to claim a continuance of your respect. In terminating this course, by a public act similar to that by which it was introduced, we are unwilling that it should be a ceremonial merely. It will comport with our wishes and habits better, to endeavour to render it serviceable to you, by striving to impress on your minds something which may at least lead you to reflection; something which may possibly aid you in advancing on your way; and even should the attempt be entirely fruitless, it may at least be pardoned for the sake of the feeling by which it is elicited.

Independent of all considerations arising out of the relations which have existed between us individually, your teacher owes a vast debt of gratitude to students of medicine in general, which, (though he may never be able *wholly* to effect,) he will certainly die in *endeavouring* to discharge. They have been the patrons who have thus far supported and advanced his fortunes; they have been the cause of all his improvement, of all the distinction he

has gained; they have been his surest and warmest friends, and so long as he continues to deserve and maintain their regard, he is reckless of rivalry and opposition, as well as independent of every influence or restraint, except those that duty and honour enjoin, or the prompting of conscience declares.

If you have made an observation on the spirit of the times in which we live, you must have been surprised, as well as delighted, at the zeal and eagerness with which knowledge is sought, and diffused on almost every subject, and among all people. The whole aspect and temper of the world is rapidly changing: from being content to be governed by mere authority and prescriptive usage, and accustomed to perform certain actions because others had done the same, there is nothing which is not subjected to the fullest investigation, the most searching scrutiny, and what is not supported by the fairest strength of reason, is rejected with contempt as unworthy the consideration of intelligent beings. This wonder-working spirit of inquiry, and solicitude to acquire knowledge, increases with a rapidity and force almost incalculable.

The science of medicine, though among the last to receive the full influence of the spirit we have mentioned, has not felt it less deeply, and already has a similar disposition for more profound and rational inquiry, laid the foundation of most important changes in every department, and shaken the throne of dogmatism and prescriptive dictation to its very centre. The profession of medicine has ceased to be a mystery known but to the initiated, and confined within the boundaries prescribed by their authority. Its principles, founded on various collateral sciences, are now to a great extent understood among

the intelligent members of society, who are daily becoming better able to appreciate the true value of physicians, and of the profession itself; a circumstance at which the young men now entering the profession have the fullest cause to rejoice. The more this ability to judge correctly is extended, the more will the real interests of medicine be promoted, the reign of empiricism abridged, and the honour of our profession advanced. The better qualified mankind become to perceive the difference between the tricks of pretenders, and the unostentatious excellence of those who have laboured faithfully in their vocations, the higher will be our inducement to increase our intellectual stores, and the rewards for our exertions will be augmented in nobleness and value in direct proportion to the extent and effectiveness of our devotion.

These things are pressed upon your attention because we wish you to examine and look around for yourselves, not on medicine exclusively, but on the general advancement of knowledge, whose march is marked by fire and smoke, and change; but, unlike the march of other conquerors, the fire and smoke is from ten thousand altars erected to the genius of improvement; the change induced is the substitution of comfort and elegance for want and suffering, of happiness and security for disquiet and danger. No victims are slain; no cities are laid waste; all may participate in the benefits produced; almost every individual endeavours to extend its influence, except here and there a few, who, unable to shake off the lethargy by which they are enthralled, cannot convince themselves that the world has not stood still as they have done, and would fain be persuaded that the movement is factitious and temporary, will soon cease of itself; requires no effort on their

part to keep pace with it, or needs but a slight exertion to stay its onward course. As well might the hapless herdsman, whose hut is in the pathway of the thundering avalanche, hope that the ponderous mass could be checked in its midway career! As well might the swelling spring-tide of ocean be denied access to the rivers, and the dread weight of the foaming surge be rolled back upon its central caves!

The use to be made of this conviction of the irresistible progress of knowledge, is, that it is incumbent on each and all of you to avoid being left behind the actual condition of the intellectual world; that you should devote your minds to the study of the profession in such a way as not only to become acquainted with its details, but gain the power which may enable you to enlarge its boundaries, and diffuse its benefits more extensively; which may be readily accomplished if you begin your course in the required spirit, and pursue it with proper devotedness. To effect this you will feel the importance of turning every opportunity to the greatest advantage, of giving every moment, whether of study, business, relaxation, or enjoyment, its due importance, and so connect the whole as to make each in its degree contribute to your grand object, that of acquiring the most useful and practical knowledge, and deducing principles by which your future advances may be more successfully and profitably made. This idea of turning every moment to account, should not lead you to suppose that it implies a life of irksome and unbending labour, a denial of all ease and freedom from toil; quite the contrary. By establishing it as a principle, that all your time should produce something good—by determining to collect every desirable fruit, you may soon

establish a habit of obeying the influence of this ruling principle to so great a degree as to read no book without deriving immediate profit; engage in no conversation without augmenting your knowledge; form no acquaintance which shall not tend to your intellectual advancement; enjoy no amusement which is not a provocative to some higher and more useful thoughts. This habit of acting under the governance of such a principle is not only attended by these advantages, but it is otherwise an un-failing source of gratification. No object is presented that does not afford some interest; no fact incidentally occurring is lost; in every place, and at all times, food for pleasing reflection is thrown in our way, and the mind thus disciplined, accumulates treasures which the thoughtless deem unattainable, and the indolent consider miraculous. Why should a student of medicine be no better than a drudge? or why should the practitioner be a mere mill-horse, and trail round, and round, and round, in one toilsome, fatiguing, monotonous career? Perhaps, it would be more correct to ask, why they *will* submit to such conditions when they might raise themselves to a more enviable and admirable condition, pursue their studies, and discharge their professional duties as truly intellectual agents, and advance themselves and their art towards that perfection which it is so desirable they should attain.

You mistake much if you suppose we urge you to act in this manner with a view to gain the mere reputation of knowledge, learning, or skill. The *reality* of it is what you should desire. Neither would we have you to imagine that it is possible for ALL to become inventors or reformers in our science, but what is still better, you, who are destined to be scattered over the surface of our coun-

try, and to whom, (if your conduct be appropriate,) the people will in no small degree look up, have it in your power, by the proper cultivation of your minds, and the most advantageous employment of your time, to aid in extending the empire of right reason and the light of heaven-born knowledge into situations where otherwise it would but slowly penetrate, or be but coolly received. Your course through life may not, indeed, be distinguished by great and surprising events, but it will be your own fault if it resemble not a gentle streamlet gliding through a fertile land, which, though seldom seen itself, is yet every where to be traced by the green and luxuriant herbage in its vicinity, and the valuable fruit growing near its borders.

In a great variety of instances may the physician minister to the diffusion of knowledge, and that with little effort, or without at all wandering from his proper course. The practitioner of medicine is regarded by all his acquaintances as a sort of counsellor, and as more likely to be impartial and disinterested than another. His opinions as to the importance and necessity of modes of education, and the comparative value of particular branches of learning, may have the most admirable influence; and these opinions he can only give correctly by previously qualifying himself to examine their relative worth. A few judicious observations, or the statement of a small number of well-applied facts, may tend to dispel the thick clouds of error and prejudice under which many of our citizens in remote situations labour, and would not in the least interfere with the business of the physician, nor trench on the province of others. Yet the greater the facility with which this good may be accomplished, the higher is the necessity that the

individual enjoying the opportunity should be prepared for the task, for, if attempted by one not properly instructed himself, he may rather confirm than remove an evil, and even render ridiculous what he is not able correctly to explain.

A student of medicine, however ardently devoted to the acquisition of technical knowledge, must at times be weary of his professional reading, and his mind demand some change, in order to recover its wonted vigour. It is at such times that he may, as an instructively amusing occupation, imbue his mind with the ornamental and useful knowledge we have pointed out as so desirable, for the sake of those among whom he is to dwell. The history of his own country, or of other nations, will aid him to form more correct notions of human nature, and more thoroughly understand the comparative value of human institutions, the true principles of government, and the circumstances most immediately tending to the welfare of society. By judiciously managing those moments when he is no longer capable of intense reflection on the business of his profession, he may, either by communing with his own thoughts, or by conversation with a friend, build up in his mind a body of principles, which, being drawn from the best data, will impart to his conduct that consistency, which is the best, we might say, the only true test of a man's real worth. The influence of example is more powerful than any persuasion, and its weight and influence on society is hardly to be overrated; this, therefore, should render us anxious to be so principled and governed, as not only to think and act aright ourselves, but by the influence of our conduct lead others to a similar course of action.

In fact, a most fruitful source of evil to our profession

is, that the minds of those engaged in its cultivation are too seldom sufficiently enlarged by previous education to comprehend its true character, the objects they should keep in view, or the necessity of establishing principles of action in preference to merely accumulating facts in detail: hence, though many engage in their studies with ardour, they too frequently become desultory in application. Then the work gradually becomes mere drudgery, and the great stimulus of leading principle being unfelt, neglect inspires disgust. The round of study prescribed by usage having been nominally accomplished, the practitioner enters on the discharge of his professional avocations with a feeling of self-distrust, and often blunders along until he falls into a routine, which, however it may save the labour of thinking, is death to improvement, the degradation of medicine, and destruction to human life.

The routinist cannot know nor feel the importance of his art; can know nothing of his own relations to society, nothing of the claims of justice and humanity upon him. He is content to prescribe by rote, and kill by rule; consoling himself by saying that he has done as much and as well as he could. But this source of self-deception should be burst up; it is one which no man who has formed his principles from a conscientious inquiry into his own relations and duties, can be deluded by. It is not enough to say that we have done as much and as well as we could. The "still, small voice" of conscience should ask, have we done as *we ought*? We have professed to be *physicians*, are we really so; have we made ourselves acquainted with the essentials of our profession—do we sufficiently know the facts on which it is based; have we wasted our time,

or neglected opportunities of learning; have we overlooked particulars apparently of no great moment, but which may prove all important in individual cases; have we duly weighed all circumstances, made the necessary inquiries and judged with sufficient care? All these questions must be answered in the affirmative, before we can be properly at ease, or before we can be allowed to console ourselves, or justify the performance of our actions. It is not enough to *mean* well—we must do well; it is absolutely, peremptorily requisite that we not only *do* all we can, but that we know *all* that we should. You may well shudder at the fearful weight of responsibility you have assumed, and of which few have an adequate idea; your actions are to involve the peace and lives of those confided to your care, and not only of such, but the pernicious effects of a bad example may be illimitably extended, through the agency of those you may attempt to instruct.

Should you suppose this a mere figment of the brain; an exaggerated estimate of the responsibilities incurred by the members of our profession, it may be thrust deeply into all your hearts, unless they be of stone. Imagine the condition your own—believe that you see the being most beloved on earth, trembling on the verge of the grave;—the fond mother who bore you; the father whose tender care protected and cherished your youth; the brother who has shared your happiest hours; the sweet sister whose slightest look or word speaks volumes of enduring fondness: or think it the case of one whom you regard as your “soul’s joy;” or of the wife who has lived in your bosom until she has grown far dearer than the life-blood’s ruddy drops; then, see, or one or all of these,

committed to the care of an individual, but *in name* a physician. What, sirs? would *you* hold him excusable for his want of knowledge; would *you* be content that he had done all *he* could; that he had exhausted *his* knowledge and skill, when that knowledge and skill might not be the hundredth part of what he ought to have gained by the improvement of the ordinary opportunities, and the correct employment of the common time?

When the clods fall on the last covering of mortality, and our dearest hopes are forever crushed; when we have committed to the dust and the worm the high-priced treasures with which heaven may have blessed us, we can *then* feel how great is the value of the man who conscientiously devotes himself to the study of our profession, and how detestable and despicable is he, who dares, without proper qualification, to take human happiness and safety into his hands, and when he has dashed the cup of life from many a lip, and strewed ashes over many a joyous head, is ever ready, with looks of hypocritic condolence, to urge in self-excusation, "I have done all I could." Apply then the same rule of judgment to yourselves that you would employ in relation to others, for thus mankind will and ought to judge of you, according to their degree of improvement. It is by the same rule, we have been assured, that a greater than human judge will eventually examine all our actions.

Having thus endeavoured to excite your serious attention to the claims which the times have upon us, and the responsibilities devolving on those engaged in our profession, let me invite you to consider some other particulars which may contribute to your future progress. It is natural to youth to be but seldom doubtful of the correct-

ness of its own views and opinions, and this vanity of self-conceit, if not early checked and subdued, may enslave us throughout life, and defraud our understandings of that improvement which it so much needs, and which would otherwise almost spontaneously flow upon us. In consequence of the pride engendered by this folly, we sometimes find persons who have commenced the study of medicine, determined on adhering to doctrines and opinions which they have most probably formed from a very limited course of reading, for which they have been very inefficiently prepared. They are too confident in their own powers of discrimination; are too solicitous to gain converts to their notions, and too resolutely bent on proving themselves to be in the right, to make inquiries that would lead them to directly reverse conclusions. These are the persons most apt to fall behind the state of the age in which they live, because while endeavouring to fortify themselves in regard to a merely plausible opinion or theory, those intent on better things have advanced so far beyond them, as to make it lost time even to look back to where such obstinates remain.

On the contrary, a real lover of truth is in nothing more clearly indicated, than by his willingness to examine all facts and well-grounded arguments, notwithstanding they may be diametrically opposed to his most favourite notions. It is the perfection of wisdom to know exactly how much we are deficient in knowledge, as we are then instructed of the points towards which we should strenuously direct our steps. The man who can freely relinquish an error as soon as he is fairly convinced, may be considered as having triumphed in the noblest manner over that injurious pride, which is one of the most ef-

fectual barriers to moral and professional elevation. That this triumph is of comparatively rare occurrence, the annals of our professional literature offer too many melancholy proofs, for we find men whose heads have become silvered by the touch of time, still eagerly engaged in defending theories and doctrines which were at first proposed and adopted in the mere rashness of youthful blood, but which their false pride enslaves them to through their maturer years, and keeps them occupied in torturing every thing for their support, long after the world has forgotten whence they originated. With such warnings before your eyes, why may not you who are now entering the path leading to the temple of science, advance without allowing yourselves to be shackled by prejudice, or held back by pride? Why may not you set forth in singleness of heart in search of truth? It is infinitely easier to learn correctly, than to unlearn opinions and notions which may have "grown with your growth, and strengthened with your strength," and therefore do we dwell with greater emphasis on these topics, than you may at this moment feel the necessity of. But should any of you hereafter find yourselves in the unenviable situation of being tied down by prejudices you are reluctantly forced to unlearn and relinquish, there is but little fear of your not acknowledging the justice of these warnings, although they did not succeed in affecting you as intended. As it is hardly possible you can yet have yielded extensively to such an evil as we have deprecated, let us indulge the hope that you will vigilantly guard against its encroachments.

Since it is now almost universally conceded that the diffusion of light and knowledge is more impeded by the

pride, folly, and prejudice of men, than by any positive and personal hatred to truth in the abstract; and as medicine has suffered from these causes to as great a degree as any other science, let us for a moment gratify ourselves with a view of the probable condition of things, were all who engage in the study of our profession to act with a proper reference to true principles. Instead of jealousy and distrust arising on all hands, we should enjoy a liberal interchange of sentiment; instead of battling for theories, and injuring our minds with useless subtilities, we should be elucidating our art by the investigation of facts, and establishing on them widely reaching beneficial principles: our profession would soon cease to be at all conjectural; our operations would have a continual tendency to usefulness; and mankind, instead of esteeming us but a better sort of traders, would regard us as the conservators of their health, the prolongers of their happiness. We should have then but one impulse, the honour of our profession, and the benefit of mankind: we might taste that peace and heartfelt satisfaction that flows from the consciousness of having discharged high duties to the best of our abilities, after having improved our time and talents to the greatest possible degree; and the rewards bestowed on our exertions would far transcend aught that in the existing state of circumstances can possibly be hoped for. Let the possibility of this consummation be imprinted on your memories; but remember more vividly, that as *you* decide, it may be hastened or retarded.

We here end the observations which are applicable to all students and aspirants in medicine: what remains to be said, being addressed to the particular members of our class, must be brief:—

We are about to part, my kind friends, after spending a season pleasantly and usefully together; selfishness might cause some pain that our lately existing relations are now to be dissolved, did we not reflect that you have higher claims on your time and attention, as well as dearer friends who are waiting to welcome your return. We separate to various quarters, to engage in various pursuits, and to many of us, this is certainly our last earthly meeting! Shall we say that this is altogether a sorrowful occasion? Shall we see you depart with unmingled regret? No! We would rather bid you hence with pleasure, knowing how you have striven to discharge your duties here, and wishing to see you co-operating in the great cause of truth. Go then! and be but as attentive to your profession as you have been during your attendance here; be but as kind and respectful to those around you as you have been to your teacher, and your friends need not fear for your success. In moments of leisure think of him who now addresses you, as one conscious of numerous imperfections and deficiencies, but your sincere friend; whose exertions, though unequal to his wishes, have yet been to the utmost of his ability; one who will rejoice at your success, and glory in your elevation.

FAREWELL!

APPENDIX.

Injurious Effects of Tight Lacing upon the Organs and Functions of Respiration, Digestion, Circulation, &c.

IT is not without hesitation that the writer ventures to call attention to the injuries produced by TIGHT LACING, being well aware that he is exposing himself to the chance of severe animadversion for appearing to meddle officiously with the concerns of the fair sex, who never fail to punish every encroacher upon their rights and privileges. Notwithstanding, as our object is, if possible, to avert great suffering and much future misery, by setting forth the evils following manifest abuses, introduced and augmented by fashion, we hope due indulgence will be extended by our fair readers, whose real good we are most solicitous to promote.

The observations of various authors have satisfactorily shown, that certain errors in dress and exercise induce deformity of person and unhappiness of mind; but their attention is almost entirely devoted to the injuries done to the organs of support and motion, the bones and muscles.* Great as are the evils they treat of, they seem slight when compared with the pernicious effects of simi-

* See the works of Shaw, Duffin, &c. on Deformities of the Spine, &c.

lar causes, upon organs more immediately essential to the life of the individual, the disarray of which, though not signalized by very obvious deformity, is inevitably followed by protracted debility and suffering, an early, rapid decay, or a painful and premature death. It is impossible for a benevolent mind, acquainted with the reality and extent of the mischief thus produced, to behold youth, grace, and beauty sacrificing the dearest boons of life to the tyranny of perverted taste and preposterous fashion, without experiencing emotions of profound regret for the immediate victims, and sighing for the future condition of a posterity derived from such a parentage!

In what way can the hitherto irresistible torrent of fashion be stemmed? Have not reason and experience been appealed to in vain? Have not the shafts of satire, the serious remonstrances of morality, and even the awe-inspiring declarations of religion, too often fallen ineffectual to the ground? One mode of producing the desired conviction in the minds of females has been left almost unattempted, and from the operation of this method much is to be hoped. It is by imparting to "nature's last, best work" a sufficient knowledge of the peculiar construction of the human system, to place in the clearest light the dreadful risks those run who indulge in the vices of dress, and the cruel maladies which are certainly induced in delicate frames by such as persist in disregarding the warnings offered by reason and science. To us it appears scarcely possible that a female of ordinary intelligence can become even superficially acquainted with the curious actions necessary to the processes of breathing, circulation, and nutrition, without shrinking in terror at the thought of the dangers to which those are exposed, who inten-

tionally counteract nature in all her benevolent designs, by violently compressing their persons, according to whatever model capricious and ever-varying fashion may dictate.

That part of the human frame most immediately subjected to tight lacing, is not only one of its most lovely external proportions, but contains and defends the organs so important and indispensable to existence, the LUNGS and HEART, which perform the functions of respiration and circulation, to purify and perfect the blood, and send its rich and vivifying streams to the remotest extremities of the system. On the perfect action of these great organs depend all our vigour and elasticity; the roseate bloom and radiant eye of beauty; the joyous buoyancy of youth, and the steady sereneness of maturity. When these functions are impaired, pallid features, anguishing debilities, melancholy depression of spirits, agonizing decay, and a long train of ghastly maladies, destructive of hope, and rendering life a burthen, must necessarily ensue.

The part of our structure to which allusion is made, is popularly called "the chest," and to judge them by their practice, many of our fair countrywomen regard it as a mere empty, flexible case, which may safely be squeezed into whatever compass the possessor pleases. Unfortunately for them, this is far from the reality; the chest is an admirably complex contrivance, whose free motions are as necessary to breathing and circulation, as these processes are to health and life. Consequently, whatever diminishes the capacity of the chest, proves directly injurious by excluding the air, and every impediment to its movements prevents the proper transmission of the blood through the lungs.

The firm, or bony portion of the chest, is formed by twelve joints of the back bone, or spine, in the centre behind; by the breast bone, occupying the centre in front, and by twelve pairs of ribs, which form all the lateral and posterior walls of the cavity. These ribs are fastened by ligaments to joints formed with the bones of the spine, which allow of a certain degree of hinge-like motion. The upper ribs, beginning at the base of the neck, are the shortest and most curved; they are longer, and their curvatures are progressively varied till they arrive about the middle of the chest, when they are again found to shorten and become less curved down to the last. The seven upper ribs are united to the breast bone by means of a gristle or cartilage going directly from the end of the rib to that bone. These cartilages increase in length successively from the first, and these seven superior are called *true* ribs, to distinguish them from the five lower ones which do not send their cartilages directly to the breast bone; but each of these ribs has its cartilage to turn up and be attached to that immediately above it, so that only the first in the series is immediately connected to the bone. Hence these lower ribs have been called *false* or *floating*, which indicates their greater freedom of motion, a consequence of their indirect attachment to the breast bone. The space between the ribs is filled up by strips of flesh called *intercostal* muscles, whose actions, or contractions, raise the ribs, bringing them closer together, in order to enlarge the chest. They are assisted in this operation by various larger muscles conveniently situated on various external parts of the chest. When the ribs are thus lifted up, being so curved that their front extremities are lower than their attachments to the spine, it follows that the

breast bone must be pushed outwards and upwards at the same time, owing to the pressure upon the elastic cartilages connecting them thereto. The chest is therefore enlarged in its transverse and perpendicular diameters by the raising of the ribs.

Another admirable provision for enlarging the cavity of the chest is that depending upon the arrangement of the partition, (called *diaphragm*,) separating this cavity from that containing the digestive apparatus. This partition is formed by a large thin muscle, which is attached to the edges of all the lower ribs, and when not in action, is arched or convex towards the chest. When this muscle acts, or draws itself tense from the circumference, its convexity is pulled downwards, or flattened, and the cavity above is proportionally augmented. To the *upper* surface of this diaphragm on the left side, the lower end of the heart case, (or pericardium,) is attached. To its under surface on the right side, the great organ called the *liver* is suspended; while under its left concavity, the stomach and spleen are situated. The tube which conveys the food from the mouth to the stomach, the great vein returning the blood from the lower extremities and bowels to the heart, and the great aorta, or main artery of the body, which carries out the purified blood to the same parts, all pass through the diaphragm by appropriate openings situated in the vicinity of the anterior surface of the spinal column.

To comprehend the necessity for the motions and enlargement of the capacity of the chest, we must know that the lungs have no power of motion in themselves. They are merely spongy or vesicular bodies over whose internal surfaces the blood-vessels are very minutely branched.

These organs in a healthy state, are not *adherent* to the inner surface of the chest, but are in immediate contact, as there is no air or other fluid interposed. Being light and elastic, whenever the walls of the chest are expanded they are distended and enlarged in proportion, and the atmospheric air, whose pressure is known to be equal to fifteen pounds for every square inch, rushes in through the windpipe to fill up the vacuum that otherwise would be formed within the lungs. When the act of dilating the chest, or *inspiration* is completed, the ribs subside, the lungs proportionally collapse, and a part of the air in the lungs is driven out. But some very curious changes are produced both upon the air and the blood during this short period of inspiration and expiration. The blood goes from the right side of the heart into the lungs blackish and heavy; the air rushes in, and this blood becomes of a bright vermilion hue, and passes to the left side of the heart purified and fitted to the support of life. The dry air which entered the lungs, composed of certain proportions of oxygen and nitrogen gases, passes out a mixture of nitrogen and carbonic acid gas, having somehow lost its oxygen, and is moreover loaded with moisture. To produce these changes on the blood is the great object of respiration. A human body of the average weight, (one hundred and fifty pounds,) is computed to contain thirty pounds of blood, which requires regular supply from aliment, and regular change by breathing.

As all the parts described are flexible and moveable from their peculiar nature and connections, it is obvious that the first effect of any tightness or constriction will be to impede their proper motions, and thrust them out of their natural position. Thus, the corset being laced tight-

est at the part of the chest having the shortest ribs, the longest and most flexible cartilages, and the most extensive motion, produces narrowing of the chest, renders its free movements impossible, and permanently deforms it by doubling the cartilages inward near their junction with the breast bone. As if this mischief were not great enough, another instrument of torture is added in the form of a steel or hickory *busk*, which is pushed into its sheath in the already too tight corset, immediately over, and extending along the whole length of the breast bone. This busk is to keep the body from bending forward in the centre, and to prevent the dress and corset from "hooping up," as it is called. As the body cannot possibly be prevented from leaning forward to a certain degree, the consequence is, that the whole weight of the superior part is sustained upon the lower part of the breast bone, which leans directly against the busk, at a point where it is least supported by the attachment of the cartilages of the ribs. The point thus injuriously pressed upon, is nearly opposite the lesser end of the stomach, and most of those who habitually lace tight, have a depression here, which would contain the size of half an egg. Either a constant feeling of aching and soreness is experienced at this point, or when the busk is taken out it is so sore and painful that the individual cannot bear the slightest pressure without an exclamation of distress.

We have then among the first effects of the tight lacing and pressure of the busk, impairment of motion, and deformity of the chest, accompanied by a constant soreness and irritation over the stomach, whose undisturbed action is one of the greatest essentials to health. If however, this was the sum of the evil, we might regard it as

tolerable; being apparently external. But when the lower part of the chest is compressed, the liver is by the same force squeezed upwards and inwards, and being a large and solid body it pushes before it the diaphragm, and forcibly prevents its descent in the act of breathing; while on the other side, the spleen and stomach are forced upwards, producing a similar effect upon the diaphragm; and the functions of all these organs, the liver, stomach and spleen, must be impaired in proportion to the pressure and displacement their delicate nerves and vessels suffer. In addition to these greater or more obvious injuries to the functions of individual organs, we may now add the evils caused to the great vital functions. The same pressure which forces the liver, &c. inwards and upwards, by squeezing the texture of the organs together, prevents the free entrance of the blood into them, and by being thrust firmly back against the spine and lower part of the diaphragm, they compress the openings by which the blood passes to and from the heart, through the great vein and artery. The consequence of thus damming up the vital current is the gradual development of irregularity of action in the heart, palpitations, tendency to faint, violent throbbings, and in some cases organic alteration in the heart itself. This same tightening of the lower part of the chest, and prevention of the enlargement of its cavity by stopping the descent of the diaphragm, acts with equal injury upon the blood which should descend from the great veins of the head and arms to the heart at each breathing. The proper quantity of blood cannot be delivered therefrom, for want of proper dilatation of the chest, and the individual is subject to violent head-aches, dullness, low spirits, extreme paleness, or leaden hue of countenance.

These readily observable consequences are but the commencement of ills from this source. The lungs being withheld from their proper actions by not being sufficiently dilated, the air cannot get access to the blood, and the blood cannot receive that purification or elaboration which renders it fit to sustain the body in health. Its watery, carbonaceous, and other impurities, are retained instead of being thrown off, and in place of a brilliant vermilion-coloured fluid being sent to the left side of the heart for the general system, it returns of a dark or bluish red, scarcely better than when it entered the lungs, and almost utterly unfit for any of the purposes of life. This condition if kept up, is soon made sensible by defective energy in all parts of the body, by various local diseases, and slight morbid changes, sufficient to render life irksome. Cold extremities, pale visages, troubled sleep, excessive mobility of system, commonly called *nervousness*, evinced by great agitation from very inadequate causes, &c. are among the most generally obvious consequences of such impairments of function.

The secondary injuries resulting from this erroneous mode of acting, are neither few nor trifling, although they are generally suffered in silence, and even attributed to various other causes. The habitual check which is given to the free passage of the blood from the lower extremities to the heart, the diminution of the quantity of air indispensable to the adequate purification of the blood, and the actual irritation produced by the unnatural fixing of the chest, disposes the heart itself at length to fall into disease. The first signs of this condition are frequently obvious in delicate females who are *tight lacers*. If they ascend a flight of steps, attempt to run, or quicken their

pace beyond a mincing walk, they are scarce able to get breath, the lips become bluish, and the heart palpitates, or rather thumps, violently. A long continuance of this preposterous mode of improving the figure, is sure to produce change in the condition of the structure of the heart, whence necessarily follows disorder in the circulation and all vital processes dependent thereon. If ladies be disposed to consider this an exaggeration, or a very rare occurrence, brought forward with a view of exciting alarm, we know of no better method to convince them of their mistake, than that of quoting the observation made in a Polish hospital, by Dr. Granville, in his recent travels to St. Petersburg. He says, "Dr. Florio called my attention to a great number of cases, in every class of disease, which it would be out of place to enumerate in the present volumes. I must not, however, omit a curious fact, with which I was already acquainted, but for the confirmation of which I was indebted to that physician, namely, the frequent occurrence of affections of *the heart* among soldiers of the guards, brought on by the *immoderate tightness of their uniform* about the waist, which gives to a Polish and a Russian soldier, (for the practice is common to both, and the same effect from it has been observed in St. Petersburg,) a very singular appearance." If the habit of wearing the Russian belt produces such frequent instances of disease of the heart among robust and hardy soldiers, our fragile and delicate fair can hardly suppose it possible that they should enjoy an immunity from like suffering, if they subject their persons to similar tortures by corset, whalebone, and busk! To ladies having any tendency to pulmonic disease, the evil consequences are exceedingly multiplied; indeed, it is impos-

sible to behold a pale and delicate female habitually yielding to this fashion, without sad reflections upon the cruelty which thus hastens on a fate that might otherwise be long averted or altogether avoided. Want of proper knowledge, and the injudicious advice of female friends, is too apt to urge such individuals to seek the artificial and destructive support afforded by tight-laced corsets, instead of which, they should endeavour to obtain strength and elasticity by unconstrained exercise, and most solicitously avoid every form of dress or adornment which in the slightest degree impairs the power of free respiration. The very weakness of body which delicate females give as a reason for the use of corsets, and which they think renders them essential, is the best possible argument that can be offered against them. The support they lend, is not only external and factitious, but is productive of still greater weakness, by the disuse into which it throws the muscles, the impediments offered to the circulation, and the direct encroachment upon the breathing, so all-essential to the continuance of strength and life. To so great an extent does the pressure of tight laced corsets destroy the muscular strength, that many delicate females faint away, or are obliged to lie down, when the lacing is loosened, after having been worn tight for some hours. Others are so far injured by this cruel contrivance, as to be unable to dispense with it during the night, and are obliged, even in bed, to wear their corsets!

But should tight lacers look upon the danger of incurring disease of the heart and lungs as remote and chimerical, they will not at least think so of those more common consequences of impeded circulation, which are productive of very extensive discomfort. Dreadful irregu-

larities of habit, accompanied by distressing pain, sick head-ache, and other similar annoyances, are the frequent punishments of those who for the sake of "making a figure," (though, as we think, *spoiling* it,) submit to the excessive compression of tight and steel-ribbed corsets. These sufferings from irregularity, are alternated with *that other** pest of female life, which generally occupies the intervals of pain, head-ache, &c. and which is as annoying and uncomfortable as hopelessly continuous, at least so long as the cause, *tight lacing*, is allowed to operate. This too is one of those maladies which makes itself known by the effect it produces upon the complexion, the eyes, the appetite, and indeed the whole system; the fact, also, is, that every man of moderate skill and observation can indicate among any number of individuals such as are thus suffering. Nothing could induce us to make public such a disclosure, or speak of any of these circumstances, if possible good could be attained by their concealment; but as the facts are indubitable, and as females have it in their power to relinquish or remove the cause of the evil, we have thought it better that they should be informed of the observation they are exposed to, in order that they may take the proper method to avoid it. While the tight lacing is continued, all attempts to employ medicines to advantage are vain; all the *specifics* on earth are idle and useless, so long as the blood which should be allowed a free course to the heart, is obstructed, and forced, in one form or other, to escape this unnatural restraint.

To say nothing farther of the actual mischiefs which tight lacing produces, the influence it exerts upon all the

* *Fleurs blanches*: whites, &c.

motions of the body is entirely disadvantageous. Can any thing on earth be more ungraceful than the gait, the walk of a female who is extremely corsetted? From the shoulders down, as stiffly inflexible as the parlour tongs, she can only advance by a sideling shuffle of the feet, which appear to get forward by stealth, instead of moving the body with that elastic mobility characteristic of its unrestrained natural condition. Instead of the easy, graceful inclination of a flexible form, we have an awkward, ungainly attempt to balance the body on the limbs; the shoulders stiffened backwards, as if shackled with iron; the chest girded in, till breath can scarcely be drawn; and the trunk of the body as rigid as if carved in wood; the figure looking like a caricature upon nature, ease, and grace! When ladies in this trim enter a room, especially after walking, they can scarcely speak for several minutes and their bosoms heave with an unnatural agitation; if the busk be of the *fashionable* length, it is impossible for them to sit comfortably in a chair; they must perch on its outer edge, to prevent the busk from being pushed towards the chin, &c. All this torture, uneasiness, and inconvenience, is patiently endured, and for what? because it is fashionable! Grace, ease, elegance, and comfort, are alike immolated to this Moloch, who spares none who pretend to the rank of *fashionable*!

In persons of somewhat more robust frames, the use of tight corsets is followed by a very severe pain, which is experienced at the time of taking them off, and rather different in kind from that we have mentioned as occurring to delicate females. The pain in this case is caused by the return of the blood to the parts which have been violently compressed by the corsets, and enjoyed but a partial circulation while they were worn. It is exceedingly acute,

and requires the corset to be very gradually loosened. Some idea of it may be formed by those who have occasionally taken off a very tight garter or other ligature, which has been worn for some hours. We feel less commiseration for such sufferers, who have not the shadow of excuse which is offered by the delicate; they do not need support, and are merely solicitous to make "a figure!"

Very probably it may be urged that the evils we have indicated are confined to a comparatively small number, and that a much greater proportion of females wear corsets without suffering these inconveniences or injuries. However true it may be that some persons use corsets with impunity, it does not in the least diminish the force of the well-founded objections made to them in the preceding observations: it may be said with equal truth, that numerous individuals use spirituous liquors, or amuse themselves by occasional gaming, without injury; yet we know that the vast majority of mankind are but too prone to pass from the use to the abuse of both the latter; and as in the case of spirituous liquors the transition from the use to the abuse is frequently so gradual as to be nearly imperceptible until the severest evils are produced, so it is most probable, especially in young persons, that the use of corsets and busk will speedily and imperceptibly advance to their abuse. There is one circumstance, moreover, which should be particularly remembered, which is, that although ladies properly educated, and aware of the danger of misusing corsets, might employ them without especial injury, the females of lower ranks in life, who imitate what they *see* in those above them, without reference to cause or consequence, will almost inevitably be led to do themselves the worst injuries. We see daily

confirmations of this in the attempts of female attendants, &c. to imitate their employers, in the article of *lacing* at least, nor is it at all uncommon for such young women to be obliged to consult physicians for various supposed diseases, which are the immediate results of their preposterous attempts to make themselves "fine figures." Many of them, with this view, keep on their corsets and busk all night, *tightening*, when they lie down, instead of loosening them, and again in the morning drawing them still closer; considering every successive half inch in the compression and diminution of the lower part of the chest, as so much "clear gain."* The consequences that speedily

* Not long since, the following scene occurred under our notice, at a boarding-house in Philadelphia. The girl of the house, a tall, good looking young woman, at the proper time in the afternoon filled the tea-kettle, and brought it to the kitchen hearth, where she placed it on a bench. To place it over the fire required considerable stooping, and this, as it turned out, was impossible to her. Repeated and fruitless were her attempts, by a sort of crouching attitude, to accomplish her object; there was no one present to assist or to relieve her from the restraint which prevented stooping, and at length in despair she gave up her trials, and stood by the kettle as if debating what she should do. The mistress came to inquire if the water was boiling, and found it not yet on the fire!—to her utter amazement, "the young lady" confessed that she had her "*long-busk*" on—that her "*lacing*," which was excessively tight, was in a "hard knot," and that she "could not possibly stoop" to put on the kettle! On another occasion, the writer was obliged to stop and admire one of these faithful imitators of high life, who, attired in a rich yellow barege frock, with gorgeous balloon sleeves, and *laced* to a most fashionable degree, was occupied in sweeping out one of the filthiest gutters in Seventh street! Nothing was wanting to complete the picture, but one of the exquisitely dressed, and Russian belted "gemmen" we occasionally see in the streets, to have shaded her with an umbrella, while she was engaged in discharging this receptacle of "liquid sweets."

follow are loss of appetite, head-ache, palpitation, and most of the sufferings already mentioned.

After all our researches, we have not been able to discover the exact origin of this ridiculous and injurious mode of dressing. That in one modification or other it has been employed among Europeans for ages, we have unquestionable proof; the circumstance of its being confined principally to those countries whose moral and religious codes have a common foundation, forces us to conclude that the contrivances of stays, corsets, &c. were designed to *conceal*, as far as possible, the consequences of levity and imprudence. The idea of *improving* the figure by their use, was originally a mere excuse to cover the *real* object for which they were worn. The disposition to imitate, so common to the human race, favoured the views of the depraved and designing, and multitudes of elegant and innocent women fell into a fashion which promised improvement to their personal charms, while in reality it was productive of their destruction. The same phantom of augmenting attractiveness by their employment, contributed to prolong the illusion to the present time, and as our fashionable females have felt the influence produced upon their mothers by this folly, we have now the superadded excuse of need of support on account of muscular debility urged for its continuance. It is not a little curious to observe the effect that has been produced upon female sentiments, by the operation of this cause. The object being to look slender, (graceful is utterly impossible, if the body thus dressed be in motion,) all rotundity of person is regarded as vulgar or inelegant, though nature has taken infinite pains to render all living forms round and swelling, both externally and internally. Hence the youthful and

unmarried are exceedingly desirous, by aid of cord and busk, to look *flat*, and in every sense of the term are successful:—the same horror of rotundity follows them through life, and nothing is so common as to find those who have lived and dressed with an exclusive view to gain husbands, with all the mawkishness of false delicacy using injurious efforts to conceal their approach to the endearments and respectability of maternity. Far be it from our thoughts to wish that our matrons should, in the slightest degree, abate of their sensitiveness on this or any other subject connected with purity of mind; but a close and somewhat protracted observation has fully convinced us, that, from the cause we have mentioned, and others we dare not speak of, an excess of false delicacy under such circumstances has become fashionable. If all the rest of the world were to resolve on the use of tight lacing, mothers should determine to lay it aside, if only in compassion to their offspring, whose health and happiness may otherwise be entirely sacrificed. If we make strict examination among children of *fashionable* parents, we shall find proof sufficient of this, even if nothing worse be discovered than pale, delicate, rickety, or scrophulous subjects, whose appearance proclaims imperfect health with enfeebled and easily injured constitutions. The injuries produced on many delicate females by tight lacing, before and after marriage, have been sufficiently great in numerous instances to destroy all the joyous hopes and anticipations which are incident to maternity, and rendered the conjugal condition one of unceasing disappointment and gloomy solitude.

Enough, however, has been said on this subject, although we have given but an imperfect catalogue of the mischiefs

produced by tight lacing. Much of what we have said will be regarded by tight lacers as a mere attempt to alarm, because they have not yet especially suffered from this cause. If inquiry be made of physicians residing in our cities, ample confirmation of all we have stated may be obtained, and proofs of still greater evils from this cause afforded.* We cannot, however, hope to effect much against the preponderating influence of fashion, considering how often it has been attempted by others unsuccessfully. Nevertheless we have esteemed it a duty to make even this imperfect essay, hoping that possibly *one* parent might be convinced, or one female saved from injury.

* The writer has twice opened the bodies of females who were addicted to excessively tight lacing. In both, the liver, stomach, spleen, diaphragm, lungs, and heart were permanently and injuriously displaced. Many of the "*liver complaints*" suffered by fashionable ladies, are entirely owing to the same cause. The following is extracted from a Baltimore paper, and is an illustration in point.

"SUDDEN DEATH.—A coloured woman, recently from New York, in the employ of Mr. F. M. Diffendeffe, of Baltimore, died suddenly on Thursday last, while standing at a table ironing clothes! An inquest was held over the body, during which the body was opened by a physician who had called in. It appeared that the deceased had been in the habit of tight lacing to such a degree, as to force the liver from its natural seat. The more immediate cause of her death was the rupture of a blood-vessel near the heart."—*American*.

THE END.





