

The study of medicine, its dignity and rewards : being an inaugural address, delivered at the commencement of the Winter Session, 1861-62, at the Grosvenor-place School of Medicine / by Francis C. Webb.

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THE
STUDY OF MEDICINE.

ITS
DIGNITY AND REWARDS.

BEING
AN INAUGURAL ADDRESS,
Delivered at the commencement of the Winter Session,
1861-62,

AT THE
GROSVENOR-PLACE SCHOOL OF MEDICINE.

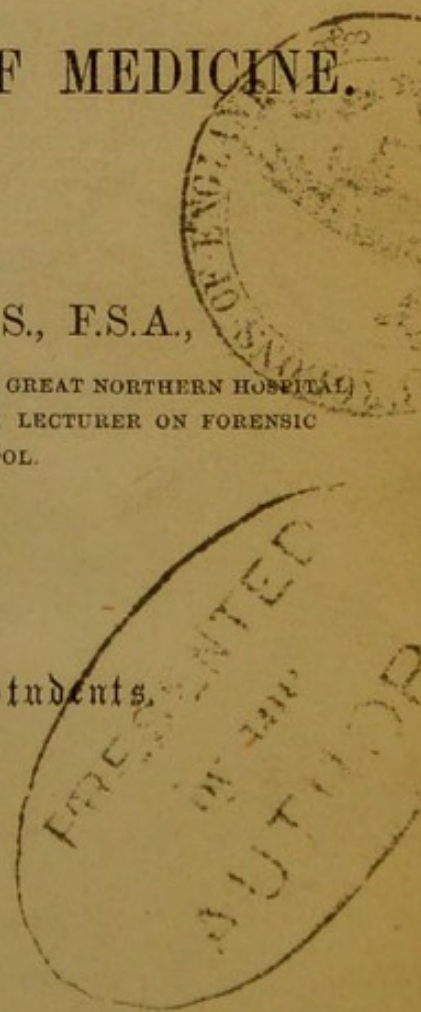
BY
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STUDY OF MEDICINE

THEORY AND PRACTICE

LECTURE NOTES

BY J. M. GOWAN

1881

THE UNIVERSITY OF EDINBURGH

1881

BY

J. M. GOWAN

LECTURER IN MEDICINE

IN THE UNIVERSITY OF EDINBURGH

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TO
THE STUDENTS
OF THE
GROSVENOR - PLACE SCHOOL OF MEDICINE,

This Lecture is Dedicated,

BY THEIR SINCERE FRIEND,

THE LECTURER.

TO

THE SECRETARY

OF THE

DEPARTMENT OF THE INTERIOR

WASHINGTON, D. C.

IN RESPONSE TO YOUR LETTER OF

THE 10TH INSTANT

RECEIVED BY THE DEPARTMENT

ON THE 11TH INSTANT

AND IN ANSWER TO YOUR

LETTER OF THE 10TH INSTANT

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THE INAUGURAL ADDRESS

DELIVERED AT THE

GROSVENOR-PLACE SCHOOL OF MEDICINE.

GENTLEMEN, — My colleagues in the Faculty of this School have entrusted to me the duty of inaugurating the Session which commences on this day, and of offering a welcome to those who for the first time enter upon a course of medical study within these walls. I would that their choice had fallen upon one more worthy to represent them ; but, however I may fail in doing justice to the occasion, I am sure none can be more earnest in bidding welcome to those who are to-day enrolling themselves as students of the art of healing, or more anxious that the short space of time which is allotted to the introductory lecture may furnish a useful and fitting preface to the great work which lies before us.

An important—it may be the most important—era of our life opens on some of us to-day.

We are here to commence a study, as ennobling in its influences, as exalted in its aims, as any to which the human intellect can be applied. The relief of human suffering, the prolongation of human life, are surely noble ends to propose to our ambition, how high soever it be ;—rewards splendid enough to rouse our efforts, how difficult soever be the path by which they are to be attained. Those of us who have already terminated the period of their student-days—I mean the period of life more expressly allotted to study ; for the whole lifetime of the physician should be an uninterrupted study of the great book of Nature—who have bid adieu to daily attendance in the class and dissecting-rooms, who have passed the ordeals of examination boards, and have entered on the practical business of their lives, will look with intense sympathy on those who are now for the first time standing at the starting-post, addressing themselves to the course. We look back to the same period, and we remember vividly the hopes, and the misgivings just sufficient to give piquancy to our hopes, which stirred us then —“the hopes and fears which kindled hope, an undistinguishable throng ;”—and with not a few of us, a sense of personal disappointment will mingle with the reminiscence, when we recollect some lost opportunities, and many unfulfilled resolves ; but with you, who are to succeed us, who are to-day to commence the same upward and

onward path we have trod, everything wears a different aspect. No partial failures have damped your resolution—hope and expectation are with you high; and, no doubt, you all entertain purposes which, if carried into action, can hardly fail to lead to success. Few men come to a medical school for the purpose of study, without secretly forming the determination to obtain the largest amount of knowledge an attendance on its curriculum will afford, to distance, by resolution and diligence, every competitor, and to fit themselves in the best possible manner for those duties and responsibilities they look forward to undertake. But it is only we who teach who know how few, comparatively, attain to the standard which nearly all propose to themselves. I would say to you, cherish your hopes and resolutions, for they are of the greatest value; do not let them die out, or, if you would escape the bitterest disappointment, do not let the resolution fail whilst the hope is still allowed to linger: but remember, that neither resolution alone, nor hope alone, nor both together, will ensure success. There is only one way to that, and that is by embodying, so to speak, your resolves, and carrying them into action—in honest, unshrinking, self-denying work. And what higher destiny, I would ask, can be allotted to any of us, than the destiny which imposes on us the necessity of well-balanced intellectual and physical work? The history of

the human race is the history of the triumph of labour. The loftiest productions of the intellect, the most splendid efforts of art, the sublimest generalisations of science, the far-reaching benefits of civilisation, are but the monuments and records of labour; and the noblest and highest—the representative men of all times—have been simply those who have worked hardest and best for the noblest and highest ends.

Accepting, then, work as at once your destiny, and as the only source from which you can hope to obtain success, it may be expected that I should here say something of the mode of commencing and prosecuting it. You have already, in making choice of the profession of medicine, bound yourselves to certain departments of mental labour. The subjects being thus fixed, it behoves you first to form a plan according to which you shall work. This plan should embrace a careful division and allotment of your time—so much to study, so much to physical exercise, food, and recreation, and so much to rest. I believe myself, it is difficult to improve on the old Anglo-Saxon rule—eight hours to study, eight to exercise, food, and healthy recreation, and eight to sleep. Certain I am, that eight hours a day, during the six working days of the week, given to real application of the mind to any subject of study, and continued for a series of years, is not only as much as the organisation of most of us will bear,

but is amply sufficient to ensure a high position amongst the cultivators of that subject of study. I am not here, however, to prescribe set rules for your guidance in this matter—let each make them for himself; but, having exercised due care and deliberation in forming your plan, let nothing induce you to swerve from it—adhere to it with iron determination and unbending will. It will, doubtless, require a strong and continuous effort; but the effort will every day become easier to you, and your power of volition and self-government will grow proportionately stronger. To act continuously on the dictates of reason, with a strong, unbending will, is true heroism. Will is the highest attribute of consciousness. Man need not, except to a very limited extent, be the creature of circumstances. The father of the inductive philosophy has said, that wise men make more opportunities than they find. Difficulties and impediments are made opportunities by the man of resolute will: not only are his intellectual faculties rendered brighter and more keen by every struggle, but his volition becomes still the stronger attribute of his nature; thus each intellectual success heralds fresh triumphs, and every obstacle overcome signalises the fresh acquirement of power.

With regard to the method of your study, the order in which you should prosecute the various sciences to the mastery of which you stand com-

mitted, I would say, follow rigorously the course prescribed by the examining boards—the sequence in which they are presented to you in this and other medical schools. Your first business is to become acquainted with the phenomena of life in Man, the structure of the organism in which it resides, and its relations to the inorganic world. But in order to this, you will find it absolutely necessary to acquire a considerable acquaintance with the whole round of biological science, animal and vegetable, together with a knowledge of the laws and constitution of inorganic nature. It is a mistake to suppose that you gain time by neglecting in your earlier career anatomy, chemistry, and physiology, in order to prosecute the more practical studies of pathology, medicine, and surgery. The first years, man wastes time and opportunities, who neglects the laboratory and dissecting-room for the hospital wards, or who follows with a gaze of wondering ignorance the knife of the surgeon in the operating theatre, when he ought to be studying the bones. Recollect that the edifice of professional knowledge you are here to rear is to be a lasting edifice—no airy and unsubstantial castle—look well, then, to its foundation. Rest assured that a knowledge of healthy function and structure is the only sure basis on which to build a knowledge of disease, and that your power of recognising and alleviating morbid phenomena will depend upon your acquaintance

with the attributes and relations of health. It is as certain that the only true foundation of rational medicine is biological science, as it is that, in the present state, death is the necessary consequence, termination, and corollary of life.

I shall not here, either, attempt to lay down precise rules as to the manner and mode in which you are to study. I may, however, say that in my own experience, the men who have succeeded best, are those who have neglected none of the prescribed modes by which knowledge is to be obtained. Never absent from their place in the lecture-room, careful and diligent dissectors, patient and pains-taking in the laboratory, and never allowing a day to pass without its due quota of well-digested reading; they have come to the bed-side of the sick with minds thoroughly fitted to observe, to remember, and to reflect. The very diversity of the modes by which they have obtained their knowledge has kept their faculties vigorous and fresh. Every faculty, whether of the mind or body, requires change; the eye wearies of the most glowing landscape; harmony, however beautiful, at last palls on the ear; and a monotony of study weakens and impairs intellectual power as certainly as the digestive functions suffer from withholding the varied nutriment they are fitted to assimilate. Remember, also, that there are certain opportunities now presented to you, which, if neglected, it is utterly

improbable your after - life can ever supply. Neglect of lectures may be repaired by reading, but no application to books can ever supply that practical acquaintance with the objects of science which is only to be obtained in the dissecting-room, the dead-house, the laboratory, and the hospital wards.

One word as to the cultivation of your mental faculties. In the first place, strive to improve your perceptive powers, by forming habits of accurate observation. To observe and discriminate morbid phenomena, requires the highest exercise of perception. This depends upon their frequently fleeting evanescent character, and upon the fact that they are often masked by and subjugated to other phenomena of entirely different significance. But it is one of the advantages which the study of the elementary natural sciences offers to the student of medicine, that they present the best conceivable discipline for the observing faculty. Apart from their intimate connection with medicine, they must ever form the school in which her students shall be best prepared for her pursuit. The highest phase of the perceptive faculty will not, it is true, alone make a great physician or surgeon, but it has been the leading and most prominent quality in many who have carved their names high in the temple of fame ; and it is certainly the first mental faculty to be cultivated.

Again, earnestly endeavour to acquire the habit

of mental abstraction. In whatever way you are acquiring knowledge, strive to concentrate all your faculties on the one object you are for the time pursuing. Unless you obtain this power of mental abstraction, or concentration, you can never succeed as students. I believe that the great difference we so constantly find in the acquirements of men who are apparently equally diligent, depends in a great measure on the different degrees in which they possess the power of diverting the mind during the hours of study from all external circumstances, of shutting all the avenues of thought, except the one track they are pursuing. Get, then, the habit early, the power will increase by practice, and you will be able at a moments notice to throw your whole mental energy into any subject that may be presented to you. You have all, doubtless, heard the often-quoted anecdote of Harvey, how at the battle of Edgehill, where he was in attendance on Charles the First, he quietly lay down under a hedge, took out a book, and read. The intellect, whose destiny it was to change the whole face of life-science ; to give the first true impetus to physiology, and the first sure standing place to medicine, could quietly pursue its labours, undistracted by the tumult and excitement of a conflict on which the fate of Empire hung.

Again, cultivate your memory by the process of frequent recapitulation, set aside a certain portion

of time in each week on which to go over the entire work of the week ; and, at longer intervals, make larger retrospects. I remember that when I was a student, I was one day complaining to, perhaps, the first botanist this country has ever produced, of the difficulty I had in keeping the characteristics of natural orders and genera in my head, that I was obliged constantly, as it appeared to myself, to be retrograding, going again and again over the same ground. He told me, that if he himself were not constantly to be employed in the same way, he should soon lose all he knew ; and this was a man celebrated throughout Europe for the extraordinary extent and accuracy of his information. Be sure, that the processes by which greatness is achieved, were they known, would be reduced to the simple category of patient, uniform, unflinching effort. There are, doubtless, differences in the original capacities of men—but these are, I believe, not the chief causes of the differences in their subsequent attainments. Expect nothing from inspiration : if any of you believe yourselves to possess what is called genius—a faculty whose intuitive action will enable you to dispense with toil—the sooner you divest yourselves of the idea the better. Aim at the highest pinnacle—but prepared to climb the ascent, step by step.

Once more, I would say a word as to the direction and development of your reflective powers.

I have told you that the first faculties to be cultivated are the faculties of perception or observation, and memory. These will make you masters of facts—objective truths—they will give you a possession, valid for all ages, and in all countries, but useless, except as the materials with which your higher attributes of reflection and thought are to work. It is the prerogative of man's consciousness to generalize on the facts or phenomena presented to him—that is, to investigate and comprehend their relations, to trace effects to causes,—and the law or principle of causality in our nature is of such paramount influence, that it compels the reason to suppose a cause, whenever the senses present a new phenomenon. When numerous phenomena of a like nature present themselves, of which we can discover no immediate tangible efficient cause, we are compelled by the same principle of causality, to suppose that they are produced by an universally-acting principle or force in nature, and to such principle we give the name of Natural Law. To trace effects to their true causes, and to refer phenomena to the action of real, and not merely imagined Natural Laws, is the highest business of Natural Science. The mode in which these results can only safely be arrived at, is that of inductive investigation—in other words, by experimental inquiry, or the process of altering the arrangements of nature, and shaping new arrangements of our own, to assist us in ascertaining the sequence of cause and effect. It is by this

process, cautiously pursued, that all the great discoveries which have thrown light on the secrets of nature, all the investigations which have borne fruit in the arts and sciences, have been made. And medicine, of all the sciences, can never, and has never been really advanced by other means. Do not suppose, then, that by the reasoning faculty alone, unassisted by experiment, you can ever arrive at a knowledge of the laws which regulate health and disease ; the causes of the phenomena which are to be daily presented to you. Your reason will enable you, not only to plan investigations, but by rigorous induction, by a process of careful exclusion of inefficient, although co-existing elements, she will lead you to the one or true cause for which you are searching, or to the discovery of the principle or law on which the phenomenon depends. I would say, then, shun hasty generalization—shun guesses at truth. Truth, the great prize with which knowledge rewards her votaries, the attainment and possession of which is the high guerdon after which man, in all ages, and in all countries, has been ever toiling, is to be obtained ; she is within the grasp of all of you. But this noble quarry is not the reward of the airy flights of imagination ; speculation discovers her not ; reason pure and unassisted loses itself in inextricable mazes in her search. Yet she is around us all, and in us all. Her great Author, who has implanted in man the insatiable desire to possess

her, has given him two Revelations wherein she is to be found. One from above, which tells of Man's relations to Himself; the other, in the glorious Universe around us, and of which we physically form a part—the reflection of the intellect of the Supreme—the everlasting tablets on which are inscribed the thoughts of the Divinity. It is with the latter Revelation we in this place have to do—search in it, investigate it, and Truth shall be your own.

Turn we now to the subjects of your study. Your ultimate end and aim is to prolong human life, by alleviating human suffering, and removing the causes of, and averting the tendency to premature death. A rational medicine must, therefore, rest on a knowledge of the conditions under which life exists, of the structure it endows, of the mechanism by which it acts, of the functions of which it appears to us to consist. In other words, as I have already told you, the foundation of rational medicine is biological science and the relations of life to inorganic nature—the science of life in its widest sense. It would be waste of words to enlarge on the absorbing interest of the study. Life—the sum of terrestrial enjoyment—that has covered this planet with beauty, that quivers in every breeze, and dances in every sunbeam; that has peopled the deep caves of ocean, asserted its Empire in the icy regions of the north, and teemed in myriad forms of grace and magnificence from the equator

to the poles, the principle which animates alike the lowest protozoon and the proudest of the sons of civilization, presents a study than which we can conceive nothing of grander or more absorbing interest. But it is not merely on account of its intrinsic interest that it claims our devotion as students of medicine. Let me endeavour to illustrate the bearings of the different branches of the life-sciences upon the special object we have to pursue. First, let us look at the structural department of human life-science—human anatomy. I should, I am sure, be insulting your common sense were I to take up your time in proving to you, that a knowledge of descriptive or relational anatomy is the only sure ground on which the mechanical art of surgery can be based. The fact is too self-evident to require more than a moment's consideration. But with medicine is this equally true? It is, although the bearing of anatomical science on medicine is to be illustrated in a different manner. The microscope has enabled us to arrive at a knowledge of the structure of all the tissues of which the human body is composed; and so complete is the state of our acquaintance with such structures, that not only is this department erected into a separate branch of Histology or General Anatomy, but it furnishes us an infallible standard with which diseased tissues and products are to be compared; and thus, on the anatomy of health rests the anatomy of disease. But the

connection of practical medicine with anatomy is not limited to that department of anatomical science which treats alone of minute and more recondite appearances. Numerous internal structural diseases impress upon the external configuration and form of the body their own peculiar stamp, or modify the phenomena which a physical examination of the surface of the healthy body elicits. The department of regional anatomy, the exact position of the organs with regard to the different portions of the surface, is a branch which is too frequently neglected by students, although it is absolutely necessary to the physician. A knowledge of the standard of healthy anatomical relation is the first thing to be acquired by him who would excel in the art of physical diagnosis. I might illustrate these propositions in various ways. Suppose yourselves living fifty years ago—a man of twenty or thirty, who has been tolerably healthy, although living a sedentary life, takes what he believes to be an ordinary cold. He applies to the doctor of the period, who notes that he is feverish, and that he has cough and quickness of breathing, with some pain about the chest. He sees the expectoration, which differs in nothing as far as the naked eye can discover from the expectoration of inflammatory catarrh. The man is bled and leeches, confined to a close apartment; he takes antimony and various other lowering drugs; and, when it is too late, it is found that he is in a galloping

consumption, and in a few weeks he is gathered to his fathers. But let the same case present itself to the practitioner of the present day. He likewise notes the fever, the cough, the quickness of breathing, the pain about the chest. He then examines the thorax by inspection, auscultation, and percussion. He finds a slight but significant alteration in the shape and resonance of a certain portion, together with some modification of the breath-sound and other auscultatory phenomena; and his knowledge of the healthy regional anatomy tells him that this cannot be due to any accidental change of natural relation, although it may be due to several pathological causes. But the practitioner is an histologist, and he asks to see what the patient is expectorating. He takes a single speck, and places it under the microscope. In it he sees portions of tissue, which he at once recognises, which he knows can alone be broken-up lung tissue. The diagnosis is then complete; the man is the subject of tubercular consumption. Blood-letting, leeches, and antimony, are not to be thought of. Fresh air, generous diet, cod-liver oil, and tonics, are the remedies, with perhaps some local counter-irritation. The man gets well, although slowly, and the practitioner owes his success mainly to the advance which has been made in the certainty with which structure may be recognised. I might add a hundred similar illustrations and still fall far short of exhausting the subject of

the relation which anatomy bears to practical medicine.

But you may say, true, no one disputes that a knowledge of healthy human structure is indispensably necessary to the curer of human disease—but the same necessity does not exist for a knowledge of the structure of lower organisms. I admit that an attainment of the same exact and exhaustive knowledge is not to be expected from, nor is it necessary to the student of medicine; although I know of no study more fitted, not only to exercise his observing faculties, but to find food for his higher powers of intellect. But need we go far to prove that some knowledge of comparative anatomy may be an essential to the true understanding of disease? I think not. A short time ago, in a country district, near Dresden, several persons were taken ill with rheumatic and typhoid symptoms; and one woman became gradually worse and worse, more and more emaciated and weaker, and at length was removed to Dresden, and placed under the care of Professor Zeucher; there she died. No apparent cause was present to account for her muscular weakness and pain—her emaciation and death. But her body was dissected, and it was noticed, on examining with a magnifying glass the muscular tissue, which was everywhere atrophied, that it was covered with minute spots. These spots were separated, and their anatomical structure proved

that each spot was an encysted entozoon, known to naturalists as the *Trichina Spiralis*. The woman's body was full of them. Did this cause her death? and if so, how were these entozoa introduced? or was their production an instance of spontaneous generation? Subsequent inquiry and experiment answered all these questions. Virchow took a portion of the woman's muscle, and mixing it with other food, fed rabbits with it. In five or six weeks the animals died—weak, emaciated—just as the woman had done. And on examination, their muscular system was found to literally swarm with the same parasites. The source of the mischief was eventually traced to the flesh of a pig, which had been killed, cured, and eaten in the district, the woman having been one of the partakers; for it was found that the hams and sausages contained a large number of *Trichinæ*. Now, the discovery and recognition of the entozoon, and the subsequent experiments undertaken, in consequence of its recognition, did not, it is true, furnish a clue to the cure of the disease, but they furnished an infallible guide to its prevention. For they proved, not only the parasitic nature of the disease, but that the entozoon was introduced from without; that it was introduced, like many other *Helmintha*, through the medium of flesh containing the living organisms; and it pointed, with numerous facts of the same kind, to the

necessity of exposing animal and vegetable substances to a sufficient degree of heat to destroy the vitality of any organisms they may contain, before they are used as human food. I need scarcely say that this is only one, and in comparison with some, a trivial instance of the obligations under which medicine lies to comparative anatomy and her sister science, zoology.

Let us look now at the functional departments of human life-science. Physiology—but human physiology is only a small portion of a science which, to be successfully studied, must be studied as a whole. The elemental principles of air, earth, and water, are the principles of which the human body is composed, by which it is nourished, into which it is to be dissolved. But before they can form the complex organisation of man, before they can constitute the brain, the organ of that intellect which has penetrated the arcana of nature, and learned, by obeying her laws, to subdue her to its will—the eye, which, directed by the same intelligence, reads in the records of the rocks below it, the past history of cycles of ages, and from the star-spangled firmament above it, the mechanism of the universe; the hand, which has changed the face of the civilised earth, whose busy industry has enabled its owner to brave the influences of climate, to transport his sustenance to the ends of the earth, and to bequeath to latest posterity the silent operations of his consciousness—before the

elements of the inorganic world can nourish these and the other organs of man's body—they must undergo combinations which shall take them out of the category of inorganic matter, and transform them into compounds analogous, although not identical with, the substance of the organs they are to form. The laws of nature have prescribed that this shall be effected by the ceaseless agency of another kingdom of living things, which stand midway between the kingdom of which man is the head and the inorganic world. From air, water, and earth, from the dew of the morning, from the rain and mist, from hill and valley, from river-delta and mountain-side, vegetable life—by its silent, but ceaseless, chemistry, is ever abstracting the primal elements in their simplest states of combination. Ammonia, carbonic acid, water, and salts, form the pabulum on which plants subsist, but which is converted by them into compounds far more complex—sugars, starch, oils, nitrogenised compounds—vegetable albumen, gluten. On these compounds the animal world is maintained, either directly or indirectly. Thus, animal, including human physiology, commences with a knowledge of the laws of matter in its most elementary condition, and of life in its simplest forms. But a knowledge of the sources of the nutrition of the body forms but a very small portion of the science of physiology. She teaches the relations which subsist between vital forces and the agents which pervade the

universe—heat, light, electricity. She teaches of the functions of every organ; respiration, and its chemistry; circulation, and its mechanism; muscular action, and relaxation; the laws which regulate secretion and excretion; nervous power, and its mode of conduction; the growth, supply, and waste of tissues; and a hundred subordinate actions form her themes. Our knowledge of but few of these life-processes has been derived from the immediate study of man. The great animal kingdom, in its unity, has been the field wherein this rich harvest of information has been reaped. Vertebrates and Mollusca, Articulates and Radiata, have all contributed their share to the materials from which the edifice has been raised; by them the enigma of the life of man has been illustrated and rendered intelligible; and on the science they have taught, rests mainly the art which is to avert from him the stroke of death.

Is it necessary I should illustrate this point? Look at the marvellous advance of preventive medicine, which is slowly, but surely, year by year, prolonging the duration of existence throughout civilised Europe. Look at the certainty with which we recognise many diseases and their causes by a comparison with the physiological standard—diseases of the kidneys, as evidenced by the condition of the secretion—diseases of different portions of the encephalon and spinal cord, as evidenced by alterations in their functions—

diseases affecting the processes of assimilation and nutrition—diseases arising from the retention of excrementitious matter in the circulating fluid. Look at the improvements in our practice, the abandonment of the routine practice of depletion, the recognition of the reparative treatment, as the only treatment to be rationally adopted in tubercle, scrofula, and many other affections, which were formerly treated by bleeding, mercury, and antimony. Look at the banishment of scurvy from our navy, and fever from our gaols; and read in all these, and a thousand other similar triumphs, the results which have rewarded a study of the laws and phenomena of healthy life.

Once more, human biological science comprehends a knowledge of the effects of all agents on the human body which are not directly concerned in its nourishment and preservation, but which are capable of inducing alterations in its structures or functions. It thus comprehends a knowledge of many portions of organic and inorganic chemistry, and many portions of the domains of botany and zoology which have not been included in the view we have taken, and the whole sciences of toxicology and materia medica. I should weary you were I to adduce instances of the bearing of all these branches of knowledge on the practice of medicine and surgery—they comprehend the larger portion of the curative and alleviative science with which we

are acquainted—but permit me, as I am a lecturer on Toxicology, to adduce one instance of the benefits which a knowledge of its chemistry may confer on the physician. A good many years ago, in one of the quiet cities of Holland, an epidemic broke out. Those who suffered, who formed a large proportion of the population, were affected with muscular weakness, with colic, and in some cases, with paralysis of the voluntary muscles. Two or three centuries earlier, the visitation would have been ascribed to astral influences, the malign conjunction of planets and constellations would have been adduced as the cause of the malady; or the Jews would have been accused of poisoning the wells, and would have been visited with banishment, fines, or burning, as they were in the time of the Black Death and other mediæval plagues. But a chemist was consulted, and the first thing he observed was, that the inhabitants had lately changed the coverings of their houses, that they had substituted lead for the picturesque tiles of their forefathers; he then noticed that the streets, which in Holland are built along the canals, were planted with pleasant rows of trees, the leaves of which, in falling, lodged on the tops of the houses, and there decayed, setting free vegetable acid and saline products in the process. He likewise found that the inhabitants relied much on rain water for their supply. He analysed a portion of this water as

it poured from the house-tops, and found it impregnated with lead. Here, then, was the source of the mischief; the water had been rendered capable of acting on the lead by the saline and acid constituents of the decaying vegetation; and thus had resulted the epidemic, of which to know the cause was to suggest the remedy. Again, this is but one out of a thousand instances I might quote in which inorganic chemistry has been the only sure path to correct diagnosis.

Having thus attempted, however, imperfectly and faintly to bring before you an idea of the foundation on which medical science rests, I might now go on to sketch the present condition of her special departments — pathological anatomy, etiology, diagnosis, therapeutics, and operative surgery; but I prefer to close this address by endeavouring to impress on your minds some just conception of the dignity and responsibilities of the profession which you have chosen. The dignity of medicine. I might illustrate this theme, by calling one by one to your remembrance, the illustrious intellects which medicine has nurtured, which have found in her science a field for their highest activities, in her practice employment for their most profound sagacity. But so numerous the catalogue, that I should weary you, ere I had recounted a tithe of the illustrious lineage of intellect to which she has been the foster parent. Or I might deduce the high rank of the science

amongst human pursuits from the enjoyment which she is capable of yielding to those who court her for her own sake. I might tell you of Harvey in his latter years, when deprived of place and position, drawing happiness and consolation, amid the wreck of his political hopes, from his "studies and the observations he had formerly made":—or of Fothergill, who at the termination of a long life, divided between arduous practice and the cultivation of those branches of knowledge on which success in practice depends, whilst suffering agonising physical pain, mentally reposing in the calm confidence, "that he had not lived in vain, but in degree to answer the end of his creation, by sacrificing interested considerations and his own ease, to the good of his fellow-creatures;" or I might take you to the pleasant meadows about Berkeley Castle, where, during the progress and culmination of the vaccine discovery, Jenner used to wander and lose himself in delicious reverie, as the prospect slowly broke upon him of removing one of the greatest scourges of human existence, and becoming the universal benefactor of his species. Or, again, I might summon my argument from the heroism which medicine is capable of enkindling. I might recount the courage of Guy de Chauliac, who, in an age of darkest ignorance and superstition, vindicated the honour of his calling amid the terrors of the Black Death; or of Gentilis of Foligno, who died

a victim to the same pestilence, but not before he had left a treatise, which still survives, upon the disease to which he fell a sacrifice. Or, to come to later times, I might present to your imaginations a picture of Nathaniel Hodges, deserted by his brethren, steadfastly confronting death in its most terrible forms, and braving, single-handed, the horrors of the Great Plague in London. Or, still nearer to our own era, I might, from amongst a thousand other instances of heroism, recite the story of the young English surgeon, who, after the first battle in the Crimea, voluntarily met his fate amid the camp of the fever-stricken and wounded Russians, and dying, achieved glory, before which even that won on the steep ascent of Alma grows dim. But I forbear to base my advocacy on the narrow basis of personal history. I would deduce the dignity of medicine from a higher source, and rest it on a broader foundation. The dignity of medicine is commensurate with the dignity of the being who is the object of her care. I have hitherto spoken to you, only of the physical nature of man, and as the ultimate object of your study, of the arrest of those processes by which his physical nature tends to death. But man possesses another nature besides the physical, a nature which acts and re-acts upon his lower organisation, modifying its processes, energising its activities, and regulating its powers, endowing it with an importance in the life circle of this

planet, to which, by its intrinsic structure, it has no claim. The psychical nature of man, which enables him to know himself, and to recognise, however dimly, from his works, the attributes of the Author of his being, is so inseparably connected with his animal life, that a recognition and acquaintance with it is allowed to be indispensable to the human physiologist, and forms a necessary part of the knowledge, which you, as physicians, must possess. It is in his psychical endowments alone that the dignity of man consists. The possession of an immaterial, indestructible principle, controlling his bodily actions, and by their aid, organic and inorganic nature, is the sole real distinction between himself and the lower forms of life. In his anatomical structure, man can only be considered as a mammal, distinguished by the large size of the encephalon. But even the larger quantity of nervous matter in his organisation, constitutes only a difference of degree. Recent investigations have demonstrated that every essential part of the human brain has its homologue in the brains of the higher Apes, and with regard to other structural differences, they, for the most part, only evidence the adaptation of the vertebrate skeleton in him to the erect position. It is not on these low insignificant differences that the dignity of man, as master of the lower creation, and the only terrestrial being capable of rendering reasonable service to the Creator, depends. It is

true, however, that all physical science points to the high position he is destined to hold. Consider for a moment the relations which inorganic nature and life, past and present, bear to his destinies. He, the last appearance on this planet, the surface of which ages had been preparing for his reception. Rivers, mighty in their ceaseless action, have washed for him the soils of continents and mountain-ranges, and deposited through indefinable epochs their treasures on ocean shores, that the rich alluvial soil might form the cradle and support of his industry. Vast primeval forests have grown and fructified, and died, to supply him the means of spreading commerce, arts, and science, over the planet of which he is highest denizen and lord. Myriads of simple organisms have lived their little space of enjoyment, died, and, converted into stone, have yielded him the material for his lofty architecture. The Great Pyramid of Egypt is composed from strata of limestone, formed by aggregations of Nummulites; and the proud capital of modern France may be said to be constructed of the minute and complex shells of countless Foraminifera. His advent was heralded by huge mammalian forms, which cleared before him a way into the thicknesses and solitudes of primal vegetation, and fertilised the soil which was to yield him sustenance. They have passed away, and been replaced by other species more fitted to his wants, and to convert for him the simpler products of the vegetable world

into higher and more nutrient aliment. The Mighty Artificer whose creature he is, and to whom he shall return, has placed at his feet all the treasures of material affluence, all the powers of organic nature. Lord of all, he alone is the viceroy of his Maker, the head and frontispiece of the results of His creative energy.

This being, ennobled by the faculties of his intellect, ennobled by the power of holding communion with Supreme Intelligence, ennobled by the subserviency of all inferior creation, ennobled by his future destiny, is to be committed to your care. The responsibilities of medicine are only equalled by its dignity. Never for one moment of your career lose sight of the intrinsic value of each human being—man, woman, or child—who applies to you for assistance. Your lot may be cast in the crowded hives of human industry, or you may minister to the defenders of your country by sea or land; it may be your destiny to stand before nobles, and the rulers of the earth, or in lowly workhouse or hospital-ward, to pursue your beneficent calling. Still, in all places, and under all circumstances, remember the dignity and responsibilities you, by your profession, have inherited. I tell you not of material preferment, of titles, rank, or fortune. *Dat Galenus opes* is a maxim, the truth of which is of limited application in the present day. But I tell you of higher rewards. I tell you of the pleasure of

investigating the material universe, wresting from it its secrets, and compelling it to yield them to the service of your race. I tell you of the high enjoyment you will receive from analysing the thoughts of the Supreme, and by comprehending them, drawing closer the cords of love and reverence which should ever bind the finite to the Infinite. I tell you of the purest enjoyment of which our nature is capable, of the enjoyment of alleviating human suffering and pain, of soothing the pangs of infancy, and healing the wounds which manhood receives in its ceaseless contest with external circumstances. I tell you of the happiness derived from the gratitude of your fellow-men, the blessing that shall reach you from the prayer of him that was ready to perish. I tell you of the enjoyment to be obtained from a life of noble toil and stalwart industry. And, higher recompense still:—I tell you that, pursuing medicine with the aims and intention I have endeavoured to portray, with a just conception of the dignity of your calling and the responsibilities it entails, ever amid your days of toil and nights of anxiety a voice, still and small as that which reached the seer of old amid the rocky fastnesses of the Syrian mountain cave, shall whisper to your inmost consciousness, “Forasmuch, as ye have done it unto the least of these little ones, ye have done it unto Me.”

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