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The Unity of Medicine.

AN

INTRODUCTORY LECTURE

TO THE COURSE OF

THEORY AND PRACTICE OF MEDICINE,

IN THE

MEDICAL DEPARTMENT OF PENNSYLVANIA COLLEGE.

Delivered Oct. 14, 1856,

BY

ALFRED STILLÉ, M. D.

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CORRESPONDENCE.

PENNSYLVANIA MEDICAL COLLEGE, Oct. 21, 1856.

PROF. A. STILLÉ—

Dear Sir: At a meeting of the members of the Class of this Institution, J. T. COSTEN being called to the chair, and D. W. BLAND acting as Secretary, the undersigned were appointed a committee to solicit for publication a copy of your pleasing and instructive Introductory Lecture of the present session.

Very respectfully,

SPENCER G. BRANDON,	*Miss.*
A. THARP,	*Ga.*
J. POGUE,	*Ill.*
J. T. WILKINSON,	*Md.*
SAMUEL STILLÉ	*N. J.*
HORACE M. CARTER,	*Ky.*
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THOS. J. BOND,	*Choctaw Nation.*
JOHN REGAN,	*N. C.*
J. H. NORTH,	*Conn.*
WM. HAY,	*Ireland.*

Committee.

PHILADELPHIA, Oct. 22, 1856.

GENTLEMEN—

I received with much pleasure the request which the Medical Class appointed you to make, and do not feel at liberty to decline it. I sincerely hope that whatever of good there may be in the Lecture will become another tie between the Class and

Your friend and servant,

ALFRED STILLÉ.

Messrs. BRANDON, THARP, and others,

Committee.

THE UNITY OF MEDICINE.

THE only certain event in life is Death. Sooner or later a sickness befalls every one which no vigor of constitution can withstand, and which no physician's skill can cure. All other illnesses spare the life, and are led to a favorable issue by natural strength, or by art, or by both of these united. Thus we perceive there is one direction in which nature opposes an impassable barrier to human power; that there is one hour in which knowledge, experience, and devotion are all in vain. But we cannot tell at what period of life the supreme summons shall arrive. At every other moment than this single one the sick man's fate is in the physician's hands. On his prudence and skill it depends whether the sufferer shall survive or perish, whether he shall rise from his couch with a shattered constitution, or whether he shall return to active life with fresh vigor, a sound and happy man. What momentous events depend upon the physician's

skill! what glory if he can guide them aright; what shame if he directs them wrong!

Now, do you suppose it can be an easy task thus to control the issues of life, to arrest disease in its threatening career, or to invigorate the wasted frame? Is this living mechanism, and are the powers that move it, so simple that we can easily determine what portion is at fault, and how it can be restored to soundness? or can we measure how wide a departure from health must be fatal to life, or even constitutes disease? One single pure drop of a liquid which we use diluted with our food may suffice to arrest the heart in full career, and so suddenly cut short the silver cord of life that the eyes stand fixed and glistening, as if staring wildly from the dead countenance. A sudden turn of the head, or an unusual strain upon the muscles of the heart, may extinguish life as a taper that the wind puffs out. Or, on the other hand, one limb after another may be wrenched from the body, an iron bar may pass through the head, a carriage shaft may transfix the chest, or a heated poker traverse the abdomen—a whole lung may be robbed of its function, the heart and its great vessels become a mass of disease which the anatomist is puzzled to unravel—the digestive organs may be the seat of vast organic changes; one half, even, of the body may be

cut off from all conscious intercourse with the rest—and yet life may survive these shocks and injuries, nay, in spite of them, it may be prolonged beyond the average duration of human existence.

Is it likely, then, think you, that an organism which in different individuals, and under different circumstances, is endowed with such singular and diverse powers and capabilities—which perishes before the insect of an hour, or which resists destruction more tenaciously than that of any other animal—is it likely that the means of guiding its powers so that they shall promote the return of health to the sick, or of developing them so that they shall reach the highest point of endurance and strength—*is it likely*, I repeat, that this can be done by those who neither know its structure, its mode of development, its manner of support, or its relations to external agents, their salutary and their morbific influence upon it? Assuredly not.

But these things constitute the science of medicine, and a knowledge of them is essential to the physician. But it may perhaps be objected: medicine was as successfully practised as it now is, before it assumed a scientific form, and may be so still without a knowledge of those departments which give to it a scientific character. This suggestion may be met by an emphatic denial. There is no historical evidence

of its truth, but, on the contrary, there is very much opposed to its acceptance; so that we are fully warranted in affirming that the treatment of disease has been successful in exact proportion to the degree of medical knowledge. What do we all recognize as the groundwork of successful practice at the present day, if not the correct diagnosis of diseases? But in this department of medicine there is evidence on every side that knowledge has been gradually progressive. The wise men of ancient times confounded affections which the physician can now readily distinguish, and the latter, having the experience of all antiquity to guide him, as well as all the light of modern science, must of necessity be more competent to treat disease than he who possessed only a portion of the former knowledge. Between the medical knowledge of the Hippocratic times and of our own there is all the difference that there is between the sapling and the oak-tree, between the brook and the river, between the morning dawn and noonday. But it is a difference of degree and not of kind. Man is the same being, sustained by the same powers, liable to the same injuries and diseases, and soothed or cured by the same remedies. What was then true in medicine is still true; but vastly more is now true than was ever dreamed of in those days of great

thoughts but small experience. The infant science has grown to manhood with all its stalwart vigor and its ample form. The sapling has become the oak. As time advanced it put forth new shoots, until what were once mere twigs have spread into vast branches, under whose shadow the nations find relief from pain, and a refuge from the destroyer. And let it be observed that Medicine, like the tree, is *one*. Its several parts, though various in form and purpose, are all essentially connected portions of an organic whole. As you cannot support the branches of the natural tree without the trunk, nor make the trunk useful except as a means of supporting the branches, nor yet lop off any of these latter without impairing the symmetry and unity of the whole, so Medicine is despoiled of its beauty and hindered in its usefulness when all of its departments are not cultivated with equal assiduity and completeness. This idea of the UNITY OF MEDICINE, it is of the last importance that every one should possess who desires to find solid advantage as well as pleasure in its cultivation, and I have chosen the present occasion as a suitable one for endeavoring to impress it upon your minds.

What, then, does Medicine embrace? The study of *man*, his *diseases*, and their *cure*. Already you catch a glimpse of the natural bond which unites the

various departments of our science, you begin to suspect its vast extent. The study of Man? But what is man? He has been called the microcosm, "the little world," as representing in himself the universe. He is material, for he has a body; he is vital, for he has life; he is spiritual, for he has a soul, and all mysteriously united in himself. The body is organized; that is its most evident quality; it is a *mechanism*, and it is curious to remark that a knowledge of this mechanism, which would appear to lie at the very foundation, and form the very corner-stone of medical science, was really one of the last of its departments to be cultivated. For nearly 2,000 years the structure of the human body was only inferred from that of the lower animals; the arrangement of the machine whose preservation and repair are the sole objects of medicine was really unknown. It is true that, 300 years before the Christian era, HEROPHILUS of Alexandria is said to have practised human dissections, and even upon the living bodies of criminals given up to him. A portion of the brain, *torcular Herophili*, still preserves his name. But in this respect he stands almost alone. Neither the pagan nor the Christian world could overcome the prejudice, which seems innate, against the mutilation of the dead, and we have to admit that for a space of time

nearly as long as that of the whole Christian era, Medicine was deprived of the light derivable from the cultivation of anatomy. It was not until A. D. 1308 that the Supreme Council of Venice permitted the medical college of that city to perform a human dissection once in every year. About the same time (A. D. 1314) MONDINO of Bologna published a very good description of the viscera of the trunk and various other parts, yet, strange to say, he apologizes for omitting a description of the internal ear by saying that the petrous bone cannot be well separated from its connections without boiling, an operation which he held to be sinful, and so rejected. In spite of these attempts to acquire a knowledge of the human structure, it was not until two centuries later that the foundations of modern medicine began to be laid by VESALIUS (born in Brussels A. D. 1514); and it is only since 1628, when the immortal discovery of Harvey first was published, that they have been really in a condition to bear any scientific structure at all. Thus the department of medicine which is the most essential of all, was one of the very last to be improved. There can be little doubt that if anatomy had been cultivated in ancient times, as it is at the present day, medicine would now have been many centuries in advance of its actual position. The na-

ture of diseases, their causes, and their remedies, would all have been far better known, and the human race would have reached a much higher point of civilization than at present. So vast and so enduring is the mischief which an irrational prejudice has inflicted!

From the time of HARVEY Anatomy was cultivated with diligence and zeal. The grosser parts were all faithfully described, but soon afterwards the use of the microscope by MALPIGHI, LEEUWENHOEK, and others, revealed wonders of structure unsuspected before. So late as fifty years ago the elementary tissues were recognized and described by BICHAT (1801), and it was only in 1838 that SCHWANN announced the surprising discovery that all animal organisms originally possess a perfectly identical cellular composition, and that elementary cells form the basis of all the higher structures. Thus, rising from one discovery to another, anatomists appear to have reached the ultimate element of organization in the *cell;* and while advancing upon their brilliant course, they have illustrated at every step the power and wisdom of the Creator, and shed more and more light upon the mechanism of those vital actions by which life is sustained, or by which, when they are perverted, life is destroyed.

But this body, this mechanism, whose parts are so curiously diffused and interlaced that almost every portion appears to be an epitome of the whole—is the seat of *life*, a force by which the mechanism is put in motion, by which it grows, and undergoes repair, and sustains innumerable relations to surrounding objects. The study of the phenomena presented in these various conditions, and of the laws which govern them, constitutes the science of physiology. Physiology is the child of anatomy; its existence is hardly possible without this latter. The physiology of the ancients was a tissue of conjectures possessing hardly any basis of fact, and indeed this department of medicine rested upon no scientific foundation whatever, until the discovery of the circulation of the blood, and that of the lymph which followed hard upon it. To a knowledge of the circulation was rapidly added all that simple mechanical methods of investigation could reveal. The admirable correspondence of structure and function was demonstrated. The process of nutrition was traced from the food in the stomach, through its transformations in the blood, and into the very tissues that it builded up. The germ of the new being was studied in all its wonderful phases, from the moment of conception, during its uterine existence, and development, until it comes forth to

the light of day a living soul. The nervous system, that mysterious structure, which seems to be more closely allied with life than the rest of the organism, through which we have consciousness of existence, and hold relations with the external world, was forced to yield a knowledge of its multiform functions in controlling and regulating all the actions of the economy.

But now, when simple inspection and even the magic glass of the microscopist had nearly exhausted the harvest field, leaving but scanty grains for recent investigators to glean, when the organs had, as it were, been seen at work, and their actions, reactions, and productions fully studied, there was still a barrier that appeared to stop all further progress, a veil that seemed to mock the inquisitive gaze. The question which, with another meaning has distracted Christendom, in a mere material sense puzzled the philosopher's brain. How is it possible that bread shall be made flesh? This question has been solved. The hand of Chemistry has thrown down the barrier; it has drawn aside the curtain, and disclosed a spectacle so vast, magnificent and beautiful, that the mental eye is blinded in beholding it. The science of organic chemistry has been created by the researches of still living men—by BERZELIUS, and

MULDER, and LIEBIG. It has thrown a flood of light upon the dark places of physiology. Its reagents have penetrated deeper than the eye, deeper than the microscope; it seems to have reached the very lowest material elements of organic life, and to be now in the act of preparing a foundation upon which pathology may hereafter build a symmetrical and imperishable edifice.

But as human physiology is only an anatomy of the living man, so organic chemistry is only a minute physiology; and thus anatomy, physiology, and chemistry are in reality but one; they are only subdivisions of the same science. To them might properly be added the physiology of the soul, which is closely linked with and so profoundly influences the body. The study of the spiritual part of man is quite as ancient as the authentic records of medicine (for PYTHAGORAS, SOCRATES, PLATO, and ARISTOTLE lived within the same century that gave birth to HIPPOCRATES), and it has in all ages absorbed the attention of the wisest men. Even more than medicine this department of knowledge has teemed with speculations; for the data of mental philosophy are not substantial, and therefore must be difficult to define. Yet to a knowledge of the laws of mind must we look, in many cases, for light upon mental disorders.

If these had been investigated as the phenomena of matter have been, we should not now have had to lament the long delayed discovery of the rational treatment of insanity. This treatment, which indeed was prompted by hearts moved to gentle pity by witnessing the barbarities practised upon helpless victims, was really in accordance with true philosophy. And just in proportion to our increased acquaintance with mental operations and the means of directing them at will, must be our success in curing that fell disease compared with which all other pain is trivial, and man's last enemy a friend.

In the remarks that have been made, I have sought to present the subject of our study as philosophers and of our care as physicians, and here our brief survey of one great department of medical science closes, the department that relates to healthy man. We have recognized him as a mechanism, examined the recondite processes by which he lives and moves, and we have glanced at the soul itself, that element of our being which the ancients so exquisitely symbolized by the butterfly, emerging from darkness into day, a delicate, uncertain creature, living in sunlight and feeding on flowers. We have seen that man, like his Creator, is triune, constituted of body, soul, and life, and yet forming but one creature, and we feel that it

is all beautiful and harmonious, a perpetual witness of the wisdom and goodness of God. And when we contemplate man's wondrous constitution, and learn how his life is sustained, we can with difficulty repress the question, Why, then, is not man immortal? Doubtless this feeling has been entertained in all ages, for we see it expressed in Grecian fable, in the more modern fountain of Jouvence, and in the eager search after the elixir that was to secure perpetual youth. Vain and presumptuous attempts! Whatever may have been the original capacity of man for immortality on earth, we know that it has been lost, and the sad record is ever before us

> "Of Man's first disobedience, and the fruit
> Of that forbidden tree, whose mortal taste
> Brought DEATH into the world."
>
> PAR. LOST, Book I.

From the beauty and the glory of creation we must turn to behold its ruins and its shame; to behold discord for harmony; decay for growth; death for life; to see the noble figure of pure and godlike man exchanged for one in which celestial fire is wellnigh quenched by earthly mists; instead of a form radiant with beauty and strength, to behold one whose brightest charms are soon dimmed by sorrow, and whose boasted powers wither before the moth. You will remember with what fearful images the poet fills the

vision of future woes which our first father beheld as the consequences of his sin:—

"Immediately a place
Before his eyes appeared, sad, noisome, dark;
A lazar-house it seemed; wherein were laid
Numbers of all diseased; all maladies
Of ghastly spasm, or racking torture, qualms
Of heart-sick agony, all feverous kinds,
Convulsions, epilepsies, fierce catarrhs,
Intestine stone and ulcer, colic pangs,
Demoniac phrensy, moping melancholy,
And moonstruck madness, pining atrophy,
Marasmus, and wide wasting pestilence,
Dropsies and asthmas, and joint-racking rheums.
Dire was the tossing, deep the groans; Despair
Tended the sick, busiest from couch to couch;
And over them triumphant Death his dart
Shook, but delay'd to strike, though oft invoked
With vows, as their chief good and final hope."

PAR. LOST, Book XI. 477.

But if the original destiny of man was changed, if he forfeited the earthly immortality of strength and happiness which he had within his reach, yet his nature was still capable of great achievements. Good and evil were still within his choice, and his dimmed yet not extinct intelligence furnished him with the means of avoiding destruction and danger, of supplying his wants, of soothing his pains, of curing his diseases. Even in the rudest form of society to which degraded man has fallen, the physician holds an equal station, or divides his functions with the priest. Before him the swarthy chieftain, whom no earthly peril can affright, confesses tremblingly the mysterious and

invisible power. In the infancy of historic nations, of Jews as well as Pagans, the same divine origin was ascribed to medicine, as if in recognition of the doctrine that disease is the inevitable consequence, and the punishment of sin. Believers and infidels agreed in this, that their only hope of relief was in the ministers of religion. And, happy that it was so! for out of the temples of India, of Egypt, and of Greece flowed that stream of knowledge on whose now broad and deep current we are borne forward to new discoveries.

Let us glance at its progress through the past.

For a long time all knowledge of disease was derived from the mere observation of symptoms: their occurrence in a fixed succession and in certain groups so as to suggest the idea of separate diseases, although not wholly unnoticed, was nevertheless not recognized fully by Hippocrates, nor, indeed, very clearly by any of his successors until very recent times. On the other hand, the importance of individual symptoms and groups of symptoms, in relation to Prognosis, was more fully appreciated, more so, it is probable, than at the present day, when our superior skill in diagnosis, and our more efficient treatment have reduced the uncertainties of result within much narrower limits than formerly. The first writer whose descriptions

contain an account of separate diseases which approaches completeness, was ARETÆUS of Cappadocia, who lived about the middle of the first, or according to others, of the second century of the Christian era. A German writer styles him the most brilliant of all the stars which adorned the bright firmament of the early Roman Empire. But even subsequent to the time of ARETÆUS, the idea of disease and, therefore, its description, extended no further than the grouping of symptoms. Whatever was more than this consisted of hypothetical accounts of the combinations into which various morbid humors were supposed to enter. Nor, during the fourteen centuries that elapsed between the commencement of the Christian era and the cultivation of human anatomy as previously described, can there be said to have been any real additions to the knowledge of disease. But with anatomical research, the discovery of the circulation of the blood, and the recognition of pathological lesions as the representatives of nearly all diseases, the knowledge of the course and distinctive features of these latter became rapidly perfected.

Time would fail me were I to attempt even an enumeration of the discoveries and improvements which have illustrated the annals of practical medicine from the time of HARVEY to the present day; suffice it to

say that they nearly all originated in the mutual support and illustration lent to one another by anatomy, physiology, and pathology. The study of symptoms acquired an interest previously unknown when these phenomena were seen to be the expressive language of suffering and diseased organs. In descriptions of disease they were now arranged with reference to the organs which produced them, and this, as in all other cases of natural classification, led to a more minute and comprehensive study of the symptoms themselves. Whoever will compare with one another the descriptions furnished by BALLONIUS and FERNEL in the sixteenth century, by SYLVIUS, BAGLIVI, MEAD, and SYDENHAM in the seventeenth, and by BOERHAAVE, HOFFMANN, HALLER, WHYTT, CULLEN, and RUSH in the eighteenth century, must be struck by the steady development of knowledge respecting the causes, symptoms, distinctions, tendencies, and terminations of diseases; and although it may perhaps be thought that we live too near the first half of the nineteenth century to judge it impartially, still, no one can help feeling that in this department of medicine, as in all others, the period just mentioned excels all which preceded it as much as the risen sun outshines the morning twilight.

Let me allude only to a few of the advances which

have been made in this department during the present century. There is the immortal discovery of LAENNEC, which has rendered the living body, as it were, transparent, so that the play of internal organs, their hindrances to action, and their decay, have been rendered evident to the senses; as in certain ingenious hives of glass we may watch the busy bee at her dainty and incessant work. There is the application of physical and chemical methods to the analysis of the tissues and of the secretions and excretions, and especially of the blood and urine, methods which have illuminated an apartment of knowledge that was hitherto penetrated only by a feeble and uncertain light. There is the whole class of cutaneous disorders once involved in dire confusion, but now rendered intelligible by a demonstration of the anatomical element involved in each. There, too, is the great family of Fevers, diseases which within the last half century have been separated from inflammatory affections, with which in most cases they were previously confounded. And what shall I say of individual diseases? In the whole catalogue there is not one of them whose natural history has not been written anew within the period mentioned, whose distinctive features have not been imperishably daguerreotyped by the light of modern science. Yet although

so much has been accomplished, perhaps still more remains to be achieved; for every year new forms of disease are revealed by a stricter observation of symptoms, or by anatomical or chemical researches, until the mind recoils at the thought of how much greater than was suspected, is man's heritage of woe.

But, instead of making this unprecedented progress, Medicine might forever have remained stationary had it not been for the cultivation of anatomy in the sixteenth century. Then, for the first time, it was clearly perceived that the body is a living mechanism, and that its diseases are often mechanical derangements of its parts which must be known before a just idea of disease can be acquired. This idea or principle, drawn from observation and not from speculation, constitutes the germ of modern pathological science. Out of it springs the fundamental fact defended, indeed, originally by the Cnidian in opposition to the Hippocratic school, that diseases are real physical entities, each one differing from every other, and insusceptible of being converted into any other, just as in an artificial mechanism every wheel, lever, weight, and spring has its peculiar office, and is subject to special derangements which produce effects (symptoms) different from those of every other portion of the machine. A disease of

the lungs is one thing, and a disease of the liver another; still more, several or even many diseases may affect the lung or the liver, and each, from first to last, present phenomena peculiar to itself. Building upon such ascertained facts, as upon a secure foundation, pathologists learned to scrutinize more and more closely the symptoms of diseases, and compare them with internal lesions found after death, or those observed during life in parts accessible to sight. Thus it was at last discovered, not only that every organ has peculiar modes of being diseased, but also that every tissue, and the blood itself, has equally its own susceptibilities, its own pathological changes, and its own symptoms. To this point, if not still further, the brilliant discoveries of BICHAT and the investigations of ANDRAL and others have conducted the present generation of pathologists. But these results could never have been attained without the aid of morbid anatomy. Symptoms constitute but one-half, and that the less important half of disease. In external affections this truth is self-evident. If we *see* that a wound is healing, a fracture uniting, an abscess discharging healthy pus, we think comparatively little of the pain or fever which accompanies these processes. But when internal parts are affected we attach a higher importance to mere symptoms, be-

cause while their source is out of sight we are obliged to measure its importance by their gravity. If, however, we are enabled by physical methods to determine the character, extent, and stage of the internal lesion, we transfer the case into the same category that external diseases belong to, and can estimate far better than without their aid the chances of cure.

From ancient times prejudice had stood in the way of all successful inquiry into the connection between diseases and the structural changes with which they are associated, and, like all popular sentiments, it was too deeply rooted to be speedily removed. Towards the close of the fifteenth century lived Antonio Beniveni, the Florentine, who may be regarded as having laid the foundations of the science of morbid anatomy, for in a posthumous work "on some of the hidden and wonderful causes of diseases and their cure," he records the results of numerous dissections of the bodies of his own patients. Fifty years later an ardent cultivator of this science appeared in Marcellus Donatus, of Mantua. Allow me to quote a passage from his writings, in order to show you how clear and elevated a view he possessed of the value of pathological dissection. "Let those," he says, "who would interdict the examination of dead bodies be convinced of their error. When the nature of a dis-

ease is obscure and they refuse to permit a post-mortem examination of the patient's remains, which presently must become food for worms, they render no service to the lifeless clay, but, on the contrary, are guilty of a serious wrong against their fellow men, for they prevent physicians from gaining information which would be of the greatest value to other persons affected with a similar disease. Those squeamish physicians, too, are quite as much to blame, who, from indolence or from too dainty a sense of smell, neglect dissections, rather preferring to remain in the darkness of ignorance, than to be at the trouble of searching for truth. They ought to remember that such conduct renders them guilty towards God, themselves, and their fellow men." This language, gentlemen, was used three hundred years ago.

The brilliant results of cultivating morbid anatomy soon attached to it a number of eminent men in the seventeenth century. Such were Schenck, of Gräfenberg (1602), Plater (1614), Silvius (1641), Tulpius (1641), Wepfer (1658), Willis (1664), and Bartholini (1654), whose treatise on this subject as well as upon normal anatomy, the labor of twenty years, was destroyed by fire; and finally, Bonetus (1679), whose *Sepulchretum* contains all that had been previously known, as well as much that was novel concerning

morbid anatomy. This author considers in succession the diseases of the head, chest, abdomen, &c. Almost another century elapsed before the great work of Morgagni appeared (1761). In it, as in preceding ones, pathological conditions of the body were considered only in connection with the particular diseases in which they occurred. No attempt was yet made to generalize the results of observation, to group together similar alterations of structure, and thus to form a science of morbid anatomy. This was first attempted by Baillie, of London (1793). Thus, although he described in succession the lesions peculiar to the heart, the lungs, the stomach, &c., he also gave an account, under each of these heads, of the several kinds of lesions, of inflammation, of tubercle, of ossification, of hypertrophy, atrophy, &c. The general anatomy of Bichat tended to perfect this arrangement, and thenceforth the lesions peculiar to each tissue were studied in their modes of development and terminations, and shown to be as much under the control of fixed laws as the original and normal growth of these same tissues.*

* Among the pathological anatomists who, since the time of Baillie, have contributed to perfect their science, the following may be named as the most conspicuous: In England, C. Bell, A. Cooper, Abercrombie, Bright, Hodgkin, Hope, Carswell, Craigie, Paget. In France, Bichat, Cruveilhier, Lobstein, Louis, Rayer, Andral, Nélaton, Dance, Durand-Fardel. In Germany, Meckel, Otto, Blumenbach, Albers, Vogel, Hasse, Rokitansky, Gluge, Engel.

Thus it was that morbid anatomy by degrees assumed a scientific form, and diseases, so far as they affect structure, were seen to receive their characteristic features from the nature of the tissue they chiefly involve. As in normal anatomy the microscope and chemical reagents were employed to conduct investigations which the unassisted vision was incompetent to complete, so the same methods were appealed to with equal success in bringing to light the hidden processes of disease. They demonstrated that morbid changes of structure are merely abnormal forms of nutrition, that the primary molecules or cells are the real seat of these changes, and, further, that the blood itself, in its chemical or physical organization, is most frequently either the starting-point of disease, or the field upon which the principal changes of disease take place. Pathological anatomy has followed normal anatomy year by year, and step by step, as closely as the shadow follows the substance. The grosser objects in each were succeeded by others which had been invisible until revealed by the optician's and the chemist's skill; and, finally, as the physiologist had traced the stream of life from its more evident manifestations in the organs up to those microscopic and mysterious cells whence it primarily springs, so the physio-pathologist has followed with equal zeal and success the

ravages of disease from the outward unsightly lesion to its prime sources in molecular derangement.

At this point physiology and pathology both must pause; hand in hand they have trod the rocky paths of science, enlightening, encouraging, and supporting one another; together they have penetrated the secrets of that divine mechanism which was a mystery to ancient philosophers, and at last, having apparently explored all its recesses and explained all its wonderful phenomena, they find that the pathway of science suddenly terminates. An adamantine door bars their progress, and upon it is inscribed in fiery letters, LIFE. Yes, that inscrutable and subtle essence, so curiously wedded to the organism, is the source of its activity, the power which evokes all the phenomena of health and disease. Bound, on the one hand, to matter, controlling its forms and functions, and on the other, united to the spiritual and immortal part of our nature, it is affected by material as well as immaterial agencies, and by either may be oppressed or strengthened, bowed down in melancholy or exalted to a vision of celestial bliss. Between the phenomena of matter which our senses and our reason investigate, and life, the immaterial cause of these phenomena, there would seem to be fixed a gulf impassable to man. We may speculate on the analogy of that cause with heat, or elec-

tricity, or any other imponderable agent, but there seems to be no reason for expecting that we shall ever behold the mysterious link which binds matter and mind together, until we shall have passed through the door that opens from the tomb.

In the survey which has thus far been taken of medicine, its unity of character cannot be misapprehended; it is, indeed, seen to be nothing but a study of the human mechanism in health and disease, living and dead. But man is placed in the midst of a material universe, where he is incessantly acting upon surrounding objects, and being subjected to their influences. Many of these influences are salutary and, indeed, essential to his existence; many are hostile to his health and even life. This simple statement points to two grand divisions of medical study, etiology and hygiene. Etiology, the science of morbific causes, which inquires into all those relations of man with material agents, internal as well as external, which are adapted to produce disease; and Hygiene, the science of health, including the conditions of its preservation and improvement. In a complete and systematic course of medical study these subjects always hold a prominent place, and are unsurpassed by any others in utility and interest. If they were more

thoroughly studied, we might have less reason to mourn the mortality occasioned by disease.

In spite of hygienic rules, or owing to their neglect, it is certain that diseases abound. They beset the path of life from its commencement to its close, attacking the germ in the womb, blasting the blossoming hopes of childhood, prostrating man in his pride of power, and cutting down the hoary head upon the verge of the grave. No wonder that it should have been one of the earliest of human efforts to find the means of mitigating the pains of sickness, and of averting death. There is, indeed, an instinct, which man shares with the brute creation, leading him to make use of various objects around him for the relief of pain; and, doubtless, his observation of the lower animals has prompted him in the choice of certain remedies for disease. Casual experience, too, of the qualities of plants and their products, of waters, and of the substances employed by him as food, led him to a further knowledge still, until he learned what would quench his feverish thirst, cool his burning skin, relieve the stomach of its oppressive load, evacuate the bowels, excite perspiration, or allay pain. Thus by repeated experiment and observation, the catalogue of remedies extended until many were found appropriate to each of the objects which seemed necessary in the

treatment of disease. The symptoms of disease, on the one hand, and the application of remedies suggested by them on the other, for a long time constituted the whole art of medicine. There was no knowledge of anatomy, or physiology, or pathology: nor, within certain limits was any needed, any more than an acquaintance with those sciences is necessary to constitute an excellent cook. Therapeutics and the art of cookery (which is a branch of dietetics) followed precisely the same mode of development: the one sought the quickest, safest, and most agreeable plan of curing disease, and the other the most certain means of at once gratifying the palate and preserving the health. External remedies naturally were used before internal ones: indeed the earliest accounts of the treatment of disease refer to the former alone. But from the time of Orpheus (B. C. 1500) to that of Dioscorides and Pliny, in the first century of the Christian era, the materia medica had become greatly enriched, and the curative effects of a large number of medicines were accurately described. Until the fifteenth century very slight additions were made to this department, but about that time the alchemists, in their search for gold and for the elixir of life, laid the foundations of chemical science, and produced the preparations of mercury and of anti-

mony. Two centuries later (1638) the precious cinchona, and ipecacuanha (1658), were added to the treasures of our art; and two centuries later still, modern chemistry began to separate the active from the inert elements of drugs, and offer the physician more certain weapons against disease.

In the whole of their career, therapeutics advanced quite independently of pathology, to which, indeed, they have only an indirect relation, one created by the art of man. On the one hand, pathology was being perfected by the gradual separation from one another of diseases previously confounded, and the discovery of elementary morbid conditions, and on the other, a gradual improvement took place in the knowledge of the inherent powers of medicinal substances, and of their curative relations to diseases.* There is no natural or essential connection whatever between disease and its remedies; the one belongs to man, the other to external nature; and human intelligence, prompted by instinct, was required to place the two in a reciprocal relation to one another. They were brought into contact by the necessities of suffering

* The need of such an improvement in his own time is thus expressed by Bacon: "Medici hujusce ætatis, licet generales intentiones curationum non male persequantur, particulares tamen medicinas quæ ad curationes morborum singulorum proprietate quadam spectant, aut non bene norunt, aut non religiose observant."—*Instauratio Magna*, Pars I.

humanity, and they were linked together by a scientific bond only when the mode of action of the one upon the other became a subject of investigation. This subject, including both their *natural actions* and their *operation* in curing diseases, involves both physiological and pathological relations. It is, in a word, the study of physiology and pathology under certain assumed conditions, and it may therefore justly claim to be a department of medical science.

I have, in my previous remarks, endeavored to illustrate the Unity of Medicine by an historical sketch of its branches which embrace the normal and abnormal conditions of the structure and functions of man, and I think you will now perceive by which of its sides the department of therapeutics is attached to scientific medicine. By another side, however, it is almost wholly unscientific and empirical—that side, namely, which relates to the practical employment of medicines for the cure of disease. Argument on this point is worthless, compared with illustration. What are the medicines universally acknowledged to be the most decidedly curative? Mercury, arsenic, iodine, quinine, opium—and yet, beyond the loosest conjecture, we know nothing of the mode in which any one of these substances cures disease. Or again, in regard to nearly all other medicines—the purgatives,

emetics, &c.—how few of them have entered the materia medica on the ground, not of their experimental operation, but of their constitution! Hardly one—indeed I know of *none*. Experiment, whether suggested by accident, analogy, or the example of the lower animals, experiment alone has ever demonstrated the existence of curative virtues in a drug, and led to its employment as a medicine. The statement of this truth may mortify our scientific pride, but it is true nevertheless.

Celsus knew it, for he said—"Non post Rationem Medicina inventa fuit, sed post inventam Medecinam Ratio quæsita est."

Hoffmann asserted it in almost the same words: "Experientia præcedit, Ratio sequitur:"

And Linnæus declared it emphatically in regard to Chemistry—"Plurima medicamenta elaboravit Chemia, sed nulla detexit."

Such, gentlemen, are some of the considerations which, it seemed to me, might inspire you with a conviction of the greatness and nobleness of Medicine, and of the pleasure to be derived from pursuing its study in a proper spirit. It is not uncommon for students to indulge a preference for some one department above others, and to cultivate it at the expense

of the rest—or perhaps, out of a feeling that particular branches are unnecessary for success, to yield them a partial and desultory attention. It may be that the established rules for graduation permit, if they do not actually encourage, this reckless contempt of interest and duty. But the student should exercise no such choice, and use no such license, as an imperfect and antiquated law allows him; he should feel it to be his duty to study with diligence *all* of the branches which are taught in the school that he attends. When he has faithfully done so, and only then, he will be competent to devote to some one among them the especial attention which his taste or his interests may dictate. But, in truth, accident more frequently than choice determines the special direction of the physician's talents. It would be easy to cite examples which prove how much stronger in this respect are circumstances than one's own will. In one, occurring in this very city, a decided predilection for surgery has not availed to prevent the embryo surgeon from becoming an eminent and exclusive obstetrician. The distinction and emolument gained by Velpeau as an obstetrical writer and practitioner, did not hinder his entire withdrawal from his original career and his entrance upon one in which he has become the most eminent surgeon of France

if not of the world. Thus in nearly every physician's history it will be found that his predilections have been forced to yield to the necessities of his position, to circumstances which he could not foresee, and for which he could provide only by making himself, while a student, a thorough medical scholar. A due sense, therefore, even of your own interests, a regard for the solid, if sordid, returns for the exercise of your skill, ought to persuade you that, as students, you should neglect no department of medical knowledge, but explore every one to the full extent that your opportunities may allow.

I take for granted, gentlemen, that your leading object in professional life is to become distinguished, to rise, that is, above the common level of your profession, and most of all above its lower ranks. I know that men are to be found (I hope not here), who are warmed by none of that noble ambition which is the very moving and vital principle of great minds, many who are content at the end of life to return to Him who gave it their talent unimpaired but also unimproved; that there are physicians whose whole "stock in trade" (the phrase seems an appropriate one) is a collection of prescriptions in which the changes are rung on combinations of active drugs, and whose whole library consists of that very excel-

lent, but not quite sufficient book, the *United States Dispensatory.* But, gentlemen, I take for granted that you have not come hither with any such false or degrading notions; that you have not incurred the inconvenience and pain of a separation from those you love best, without having formed a more or less distinct idea that the schools of Philadelphia can furnish you with a professional education it was impossible for you to obtain at home. You must know already that the great toil of your life is before you, and that with your life only will it terminate. You should feel that the boundaries of knowledge are like the natural horizon, forever widening as you rise, and that although you should ascend above the ordinary level perpetually during a whole lifetime, scale every height, overcome every barrier, and even mount on wings as eagles into the highest empyrean that the mind of man has ever reached, you would still behold on every side the less distant but still impassable limit beyond which human genius cannot penetrate during the brief period of its earthly power.

But because the finite and the transient cannot grasp the infinite and eternal, there is no reason why we should mope in some dark corner of the world, like bats that shun the light of day, or that we should sneer at those who, like the ambitious Icarus, perish

in attempting too lofty a flight. We should remember our divine origin, that we are "a little lower than the angels," and that the only possible assimilation we can obtain to our Creator is by improving to their utmost all of the faculties with which he has endowed us. By so doing *we* may deserve the epithet "godlike," a title which is often impiously conferred on the scourges rather than the benefactors of the human race.

If the estimate of Medicine which I have endeavored to give, and the spirit I have endeavored to describe, are permitted to sway us, our calling thenceforth becomes a sacred one; the energies of the intellect are warmed by the zeal of the heart, wisdom is consecrated to humanity, and as we rise in knowledge we increase in power to diminish suffering, insuring happiness to ourselves, and dispensing it bountifully to those who shall become living monuments to attest and to proclaim our skill.