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With regards of
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ASPECTS OF MEDICAL SCIENCE.

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Read at the Annual Meeting of the Mass. Med. Society,
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Since the days of Sydenham, practitioners of medicine have been divided into two classes—scientific, and the so-called "practical" men. The distinction is an altogether arbitrary one, but, through constant reiteration, has come to be looked upon as valid. Members of the profession, sometimes wittingly but oftener through carelessness, have adopted the distinction, as they have winked at the term "allopathy," endorsing the false note and giving it currency, greatly to our own detriment. The injury might have ended with us, in such looseness of thought as the vague use of terms always begets, had it not opened the way for misapprehension on the part of the laity concerning the abilities and duties of doctors. This misunderstanding is much more wide spread and pernicious than would appear at first glance—amounting to almost terror of science on the part of the ignorant, and in the minds of the more intelligent to a belief in a supposed inherent distinction between scientific men and "family physicians." The public mind, always inapt in respect of nice discriminations, cannot dissociate science from mere theory, hence have arisen the whole catalogue of slurs, inexpressibly foolish when applied to rigid students of the phenomena of disease: "impractical," "wanting in common sense," "book-worms," "vagarists," *et id genus omne*. To a close observer and thinker, however, the broadest distinction exists between science and vague theory, and what

I have to say to-day is in illustration of the proposition that SCIENCE IS NOT OPPOSED TO PRACTICAL RESULTS IN MEDICINE, BUT ON THE OTHER HAND ITS RESEARCHES CONSTITUTE THE BASIS OF ALL TRUE AND PERMANENT ADVANCE IN THE ART OF HEALING. It may be that, from a candid consideration of this subject, we shall come to better understand our daily obligations to science, and that some corollary for practical every-day use may suggest itself.

The "Art of Healing" considered abstractly and in exact definement, presents itself as a problem composed of two elements: the "Natural History of Disease," and the exact physiological action of means of relief or cure—such means including not only articles for topical or internal exhibition, but all constituents of the Materia Medica—Subjecta, Ingesta, Circumfusa and Medicamenta.

The first element, that of "Natural History," is the resultant of many factors: cause, duration, seat, temperature and pathology, itself a factor capable of subdivision, while our relation to this element finds expression in diagnosis and prognosis. The value of this relation to ourselves and to our patients depends primarily upon our appreciation of all these factors, the methods of their determination, their exactness, positive and negative characteristics, limitations, &c., rather than in any ignorance or unqualified assumption of them as parts of a proved proposition. As a rule this appreciation evinces itself in our justness of bearing towards experiments and researches looking to the elucidation of these points—discoveries in anatomy, normal or morbid, researches in chemistry and physiology—improvements in general surgery or elaborations of its special departments—the eye, ear, uterus, larynx, venereal disease, dermatology, &c.—in short, towards Science in any of its workings and manifestations.

Beginning, then, with the subdivisions of our first element we find that the *causation* of diseases, especially those of the zymotic type—always the object of guesses more or less happy—has of late been subjected to rigid investigation. Typhus fever yields to patient observers some secrets of its predisposing and exciting causes, and to drinking-water impregnated with organic impurities may be ascribed the especial severity of some outbreaks of cholera. That at St. James Westminister, London, in 1854, owed no small part of its fatality to the water of a well in Broad Street, "famous," says Dr. Anstie, "for its sweetness and freshness." Repeated analyses of the water by Dr. Snow, demonstrated the presence of these impurities, and discontinuance in the use of it was attended with immediate abatement of the disease. So also the development of cholera among the inmates of the houses supplied by the "Lambeth," or "Southwark and Vauxhall Water Companies" respectively —the mortality (even in the same street, and in houses directly opposite one another) being in exact ratio to the amount of organic impurities in the water used.

Again, the exciting cause of typhoid fever has been even more carefully and laboriously determined. The war now raging between Murchison and Dr. Budd, is a war of words merely to determine which link in the great chain of cause and effect shall be considered "immediate causation." The tide of battle surging between the maintainers of the "pythogenic" theory and its opponents, leaves at each ebbing a deposit of scientific truth—the outcome of rigid studies, exact calculations, innumerable chemical analyses of water and the vapor of sewage—all of which serves to lift Etiology above the plain of happy guessing to that of a science—a science not all-embracing nor as yet very broad, but close and compact, to which much may be added but from

which nothing shall be taken away in the coming years. And this science finds expression in such sanitary and preventive measures—cleanliness, deodorization, pure water and drainage, as make disease less fearful and more manageable, epidemics less prolonged and fatal. Surely this is practical.

Knowledge of the *seat* of disease — the exact organ or tissue affected, and the liability to complications more or less serious — increases *pari passu* with advances in medical science. Observations of the external phenomena of disease, if unsupported by rigid tabulation and comparison in the milder cases, or in the severer by post-mortem verification, would leave us still in the open field of conjecture. It has fallen to the experience of the youngest of us to learn that symptoms the most prominent and obtrusive often prove unimportant, or of but secondary significance; brain symptoms in carditis, diarrhœa in pneumonia, hydrocephaloid in the acute enteritis of children, spasm of the glottis at the onset of rickets, albumenuric retinitis, irregular action of the heart, or dyspnœa in organic disease of the kidneys. So, too, the "signs," that for want of clear comprehension on our part have been styled diseases, resolve themselves latterly, under nicer study, into mere evidences of a broader underlying cause. Vague terms are fading from our nosological tables; special plans of treatment with reference to stomach or spirits are abandoned; liver diseases in adults, and worms in children, are playing subordinate rôles, and "slow," "infantile remittent," "low," "gastric," "bilious," and "continued" fevers are disappearing, swallowed up in that broader condition known as typhoid, whose seat and pathological concomitants are known with even microscopic exactness. Such recognition of these symptoms and complications as simplifies our nosology, and so relieves mental

confusion, tends to render clear and easy diagnoses otherwise impossible, and puts treatment, if treatment other than hygienic be deemed necessary, upon a more rational basis. This, too, has a "practical" aspect, as has also the introduction of the element of *temperature* into our calculations. The thermometer, though at first unduly praised and criticized, like other adjuvants in investigation has gradually asserted and maintained its claims to notice—claims based upon nothing so little as guesswork, or even upon statistics imperfectly interpreted, but upon critical observations now almost innumerable—those of Wunderlich at the Liepsic Clinic alone amounting, in the year 1865, to more than 600,000. Over and over again these observations and the deductions therefrom have been verified by Virchow, Griesinger and Traube, in Germany; by Becquerel, Bernard and Breschet, in France; by Parkes and Jenner, Bennett and Anstie, at Edinburgh; at Guy's, St. Thomas's, at Westminster, and later by the leading observers of our own great Hospitals. While these observations throw but little light upon the question of the absolute cure of disease, they offer, as practical outcome, proof that preternatural heat is a constant and essentially dangerous concomitant of fever, and that rigor is a wholly subjective phenomenon, dependent on the condition of the peripheric nerves and not accompanied by any decline in temperature. They have taught us the typical laws of particular forms of fever, "supply a basis by which to determine whether any individual case is progressing as it ought;" enable us to anticipate the onset of fever in puerperal women; to prognosticate with certainty paroxysms of ague; afford a means of absolute differential diagnosis between typhus and meningitis in cases otherwise obscure; point inexorably to the thorax in acute tuberculosis in the absence of cough, expectoration, or even hurried res-

piration, and in the exanthemata enable us to forestall, by palliative means at least, the days of greatest discomfort.

Of Pathology, the last, and possibly the most important subdivision of our first element, we may speak but briefly. The light thrown upon the "Natural History of Disease" by researches in this department of study, enables us to posit a line of demarkation between the curable and essentially incurable — a line varying somewhat in its individual increments from year to year, but which always holds a place consistent with all known data — and even anticipates, by position and tendency, new developments in therapeutics. It proves that *inflammation* is but modified nutrition, of which pain, heat, redness and swelling are the accidents and not the essence; furnishes us, to dwell only upon the more obvious matters, with exact data concerning healing of wounds by "first intention" and by granulation — the granulations of ulcers — the anatomical peculiarities of the walls of abscesses; tells us what tubercle is, what it indicates and how it tends to fatality wherever found; tells us the how and why of the duration of certain diseases, and indirectly teaches us what Nature can and will probably do—at the same time suggesting, by implication at least, the proper moment for interference or the judiciousness of withholding our hands. Viewed from the surgical side it affords still more important revelations concerning the healing of fractures, the function of the periosteum, diseases of joints and foreign bodies therein — anchylosis, curvatures of the spine, caries and necrosis and the nature of tumors. How immediately practical such revelations may be in their bearing on wise procedure, no one of us can have failed to observe. In truth in tumors, what concerns us chiefly, perhaps wholly, is their *tendency* rather than their topical or plastic manifestations (excepting always those outgrowths, which, though by

nature innocuous, tend to fatality through rapid recurrence). Vascularity to aneurismal thrill, or non-vascularity and density to the appearance of cartilage, rapidity or slowness of growth, excess or deficiency of fibrous, cellular, glandular, serous or epithetial tissue, are but the inconstant local peculiarities of any outgrowth under whatever form occurring. The one significant fact concerning it, *cæteris paribus*, is the presence or absence of some cell which fails of correspondence with the ultimate element of any tissue recognized as typical. This cell, never so much as imagined after centuries of study and observation in the gross, stamps, in the present state of therapeutics, the seal of fatality upon all such outgrowths as contain it in great numbers, and proves to be the constant outcome or cause of a malignancy of which all other conditions are the insignificant concomitants. This is the one practical matter for us to know concerning tumors, for on such knowledge must be based, if it would be wise, our treatment and prognosis. So much for our first element of "Natural History."

The stock criticism urged against us as a class has of late assumed the form of a complaint that though we are coming to know more of what disease *is*, we fail to advance proportionally in our knowledge of the means of cure. The criticism is specious, but neither altogether true nor sound, since the very knowledge ascribed teaches us, as we have seen, the essentially incurable nature of some diseases — restrains us — tells us that many formerly supposed cures could have been but coincidences, and suggests caution in the exhibition of our remedies. The new light thrown by science upon one element of our problem of cure, even when faint, sometimes serves only to bewilder us, as morning or evening twilight blinds and bewilders men long immured in dark dungeons. As an effect of this knowledge,

resulting in an enlightened skepticism, Chomel's rule of "doing nothing when uncertain what to do," is usurping in wiser quarters the old English and American practice of when doubtful giving a dose of calomel—a result of incalculable advantage to our patients. But this negative virtue has its complement in positive acquisition. We know, as the result of chemical and physiological investigation, more than formerly of the action of certain drugs—their time of absorption and elimination—duration of action and reaction; that gallic acid does its work and is eliminated in two hours, acetate of lead in not less than six or eight hours; that the seemingly safest dose of turpentine, too large for stimulation of the primæ viæ, too small for catharsis, in spite of its conservative name of "medium," is the really dangerous dose. Specialists have taught us much to be followed and to be avoided in the employment of certain remedies—Hydropathists of water, Oculists of belladonna, Venereal ists of mercury and iodide of potassium, Dermatologists of arsenic and the external application of alkalies. Brown-Séquard teaches some, and suggests more, uses of the bromides, by first showing their physiological action on the blood-vessels of the nervous system. The science of chemistry in one of its exactest attitudes gives us the antidotes of poisons. Out of a German laboratory came the inspiring whisper of the possible therapeutic value of chloral hydrate. Parkes and Wallowicz, Schulinus of Dorpat, Anstie and Dupré, are revolutionizing our belief in alcohol; Radcliffe, working from a different stand-point, confirming the latter observers as to neuralgia and its appropriate treatment by gentle stimulation, and within a few years Briquet has solved for us scientifically and almost exhaustively, the action of Peruvian bark and its alkaloids. Practically, our brothers came back to us alive and in health from Southern swamps, where every

exhalation was pregnant with disease; and only months ago, around Metz, following, as he himself testifies, the hints afforded by laboratory experiment on the antipyretic action of quinine, Prof. Binz brought back to life German soldiers dying of septicæmia, as if by some miracle of healing. Indeed, there is now, not opposed to but supportive of the practice of therapy strictly empirical, a science of therapeutics on whose teachings, consciously or unconsciously, each one of us relies with a degree of assurance in his attempted control of hæmorrhage, in his choice of a remedy for the inducement of sleep, for mastery of the miasmata, and in the treatment of all diseases characterized by periodical exacerbations — a science not more responsible for the pretensions of quack panaceas than is this Society for Townsend's Sarsaparilla or the Russia Salve.

Let us pause here for a moment to see how and where we stand. Practicality or Empiricism claims for itself the distinction of resting on a basis of facts. Well, Science, through its disciples — philosophers, general practitioners, or specialists — working patiently and with catholic tendency, discovers facts on every hand. More than this, it collocates, groups, and arranges them, and furnishes us with principles to which those now known and all subsequently discovered facts can be referred. Therapy looks to method, rather than to isolated observations, in the study of drugs for its greatest advances, and the profession owes much of its knowledge of the "natural history" of disease to accurate and systematized investigation, which is Science. The especial advantages, negative and positive, of such knowledge, manifesting themselves in non-interference no less than judicious treatment, suggest as a practical deduction the primal and essential importance of diagnosis. Improvements in treatment, better statistics, smaller percentages of death other

things being equal, marked sanative results, follow thorough comprehension of disease in such direct causative relation as to defy the suggestion of accident or mere coincidence. Indeed, approximation to nearness of understanding of the disease in question, and only this, renders possible the sure aiding of nature by enforced sanitary measures, or otherwise. Complement such knowledge by clearness of view of some therapeutic means, and our cure-problem, if in the nature of things resolvable, becomes comparatively simple. The most critical examination may leave us to conjecture after all, but to a *reasonable* conjecture, and not to the flippant, arrogant guess-work that fails oftener than it succeeds. "The conjecture which guides the physician," says Dr. Latham, "is rigorous and calculating and honest. It acts strictly by rule, and leaves nothing to chance. It does not see the thing it is in quest of, for then it would no longer be conjecture. But because it does not see it, it ponders all its accidents and appurtenances, and noting well whither they point, it takes aim in the same direction, and so oftener hits the mark than misses it. And succeeding thus, it knows why it succeeds, and it can succeed again and again upon the same conditions. Next to knowing the truth itself, is to know the direction in which it lies." This is the peculiar praise of a sound conjecture, and any assistance, instrumental or other, tending to render such conjecture possible, should not be neglected. All adjuvants in medical diagnosis, as in other departments of science, incur the double risk of undue laudation and distrust. The solar and chemical microscopes not long ago, and lately the thermometer, suffered apotheosis—were so bepraised as to excite all conservative minds to ridicule, till Dr. Holmes's "Stethoscopic Fly," exceptionally an entity, was claimed under imaginatien as existing everywhere—the reactionary wave of skepticism

in its turn rolling beyond the point of rest. But the oscillations ceasing, no wise man ignores, in critical examinations, microscope or stethoscope, ophthalmoscope or thermometer. "They are but artificial and refined means of scrutiny. They cannot enlarge human capacity nor strengthen human understanding;" but beyond the reach of human eye or discrimination of human ear or accuracy of human touch, they find their proper work, bringing within cognizance objects and elements otherwise unknowable. No most delicate musical ear, unaided, can always distinguish the fine crepitus of incipient phthisis from the râle of capillary bronchitis, yet a world-wide difference lies in the treatment and probable prognosis. The hot, dry, pungent skin, at the onset of scarlet fever, coexists with a temperature of 102° Fahr., while the softer, moister, and less burning feel of the climax, is coincident with 105° or 106° Fahr. "It is not," said Lord Bacon, "the insufficiency or incapacity of man's mind, but the remote placing thereof that breedeth mazes and incomprehensions; for as the sense afar off is full of mistaking, but is exact at hand, so is it of the understanding—the remedy whereof is not to quicken or strengthen the organ, but to go nearer unto the object." This our instruments enable us to do, and so serving should be employed, judiciously, as subsidiaries, not substitutes, when unaided sense fails. All power, every instrument, all knowledge of each and every branch of medicine, all faculty of clear or logical reasoning, should be brought to bear upon our diagnosis. No supposition should satisfy when exact knowledge is attainable. No appeal to a limited personal experience is justifiable when the records and deductions of combined experiences are accessible. No amount of time or patience can be considered superfluous until the problem is solved or is proved too intricate for solution, and, whatever treatment

may be under the light afforded us through such critical inquiry, and it is often confessedly faulty, without it it is altogether pretentious, impertinent, shallow.

But hypercritical attention to unimportant details is sometimes mistaken, by performers and bystanders alike, for scientific thoroughness. Elaborateness is not of necessity accuracy, though it is often the wearisome concomitant of accuracy, and the nicest discrimination of symptoms is perfectly consistent with rapid generalization. A moment's touch of the radial artery determines for the trained brain its quickness, force, rapidity and volume, though no wise look be assumed or watch consulted. The record books of great hospitals often furnish an example in point of how much can be written, how many observations — each elaborate and accurate in itself — can be recorded without furnishing one with any adequate conception of the appearance of patient or a hint concerning diagnosis, prognosis, or treatment. It is wearisome to remember how the memories of students are overloaded with details — daily records of chest measurements in cases of pleurisy, where the question of effusion had been determined beyond the shadow of doubt; records of pulse in diseases whose natural history shows every variety of cardiac action; records of dejections always normal; records of urine tests where no kidney involvement was to be feared; records of sleep in hours and minutes, where sleep, or the absence of it, within wide limits, was utterly irrelevant to the treatment or issue; examinations of blood-corpuscles in short-lived functional derangements without suspicion of previous organic or zymotic disease — and so on, if not *ad infinitum* at least *ad nauseam*, the salient cardinal points of the cases either forgotten or brought down to the dead level of ordinary symptoms. This is the disease of Science — the cant of its sham disciples who substitute

shadow for substance, who seek to comfort pneumonic patients dying for want of proper food and stimulus, by the assurance that their urine has been frequently and critically tested for the chlorides!

The most patient and rigid study for diagnosis, if it be wisely honest, is conscious of conditions beyond its ken—of knots of symptoms where the most pertinent revelations seem tied up the tightest—of points that defy scrutiny. Moreover, it is conscious of exigencies that demand immediate action on the basis of their broader features; hæmorrhages that must be checked at any hazard; attacks of pneumonia presenting such complete and overwhelming congestion as to demand the lancet in full view of the long convalescence or even possible death from asthenia; spasmodic colics, where in wisdom no cause may be sought, but where pain demands instant relief—in short, cases where all attempts at study are as foolish as they are ill-timed. Treatment in such emergencies, far from being rationalized, is only crippled by inquiries into the scientific aspects of the case. "The real physician," said Broussais, "is the one who cures. The observation which does not teach the art of healing is not that of a physician, it is that of a naturalist." Still, such cases, necessarily occasional, should not render us illogical. They cannot invalidate the rule that we owe to each problem the deference of attempted resolution, any more than the birth of sporadic genius of insignificant parents invalidates the rule that like begets like. Nor do they detract an iota from the significance of Cullen's dictum "that neither the acutest genius nor the soundest judgment will avail in judging of particulars in which they have never before been exercised."

I would not be understood by these remarks in any way to decry or undervalue experience. More than two centuries

ago the wisest and most philosophical of then living men concentrated in a single clause all that could be said upon that point — "they be the best chirurgeons which being learned incline to the traditions of experience; or being empirics, incline to the methods of learning." Out of such union springs the highest curative skill, as naturally as out of the elements of earth and air, by selective capacity in root or tendril, and by a method which God knows, some consummate flower is elaborated. But all unrecorded experience, even when evidenced in daily practice, is necessarily exclusive — confined in its benefits to those in immediate contact with its possessor. Moreover it is by nature arbitrary, quite as often possessing men as they *it*. It has great value for us in the vast fields of learning and labor, yet intrinsically and alone is worthless. It is often crude, blind — leading men to false no less than sound conclusions; deals in the *post hoc* rather than the *propter hoc;* supplies reason with materials for work, yet is powerless to work; is accretive, prehensive — gathering anatomical, chemical, therapeutical, physiological data, as results of its labor. But just here the specific work of experience, as such, ends. Science objectively, or the methodizing faculty which is the subjective analogue of science, seizes upon these materials: inquires the how and why; rigidly examines each body of seemingly analogous or similar data; draws its lines of impenetrable distinction between truly logical deductions and specious though unsound inferences; systematizes, compresses, and makes portable what before was clumsy and useless through clumsiness; tabulates, formulates, coördinates; broods over this chaos of elements until a kosmos is evolved whose beauty and symmetry excite admiration, and whose use no sane man may deny. And these results, so elucidated and arranged; so interpenetrated by a method which allows the broadest

freedom of observation, while it binds us to rigor, and nicety and exactness of inference, enter in as an element of the later, and so wiser, experiential philosophy of all subsequent students of medicine, if they be students indeed. Who can doubt the practical worth of all this?

Yet this Science of which I have been speaking, in no wise encroaches upon individual thought or philosophy. It gladly bends its ear to the persuasions of genius — to all prophecies and intuitions that carry with them the stamp of reason. It knows well that McLeod suggested long ago in India its own present pet treatment of typhoid fever and dysentery, and reverentially remembers that Gibson anticipated, by more than thirty years, the surgical propositions established by the American and later European wars. It simply holds to the proposition that "the laws of nature are to be discovered by accurate observation and generalization of a sufficient number of phenomena, and not by any abstract philosophical mode of reasoning." Holding firmly to this ground, and recognizing fully the truth that the grace of prophecy comes to but few Sydenhams or Abercrombies, McLeods or Gibsons, it simply attempts to give to all data so proved and arranged as to furnish a basis for reasoning approximatively correct — leaving to the acumen and ability of each one of us the solution of the problems of individual cases; in its broadest and truest expression accomplishing what Hufeland declares its highest possible attainment — to *generalize* the disease and to *individualize* the patient.

If there be any truth in what has been said, the deduction is an obvious one. There can be no valid distinction between the Science and Art of Medicine, since it is the substratum and informing method of science that renders our daily practice other than a confused jumble of guesses, even artistic. All attempts at invidious comparisons between our

art and medical science are mischievous and to be reprobated. They have crept into our literature, and essays upon the "Art of Medicine," as something inherently distinct from the visible practical results of scientific training, have come upon us of late like the locusts upon Egypt, and with analogous result — working mischief in our thoughts, and paralyzing our great schools in their attempted reforms. The fact stares us in the face that our students seek other means of instruction than those furnished at home, while we who are in the whirl of active practice look to the incoming steamer for food for medical reflection. We but beg the question in stating or reiterating our belief that "it is the fashion," so long as the best and most promising and eager, those who have used faithfully every offered opportunity, feel most acutely their need of something more — so long as the very teachers of whom we are most justly proud, almost without exception, received their final instruction as students in London, Paris, Edinboro' or Dublin, or in later years at Berlin, Leipsic, Göttingen or Vienna. The record of the American students in Europe is one to be proud of, and the fashionable traveller in search of some easy road to medical fame, or the dilletante, has played but an unimportant rôle among them. They have shown equal capacity with their foreign brothers when equal opportunities for observation and study have been offered them. Our schools are realizing this, and trying to remedy their defects — encountering their greatest opposition in the careless attitude of medical men as manifested either in passive indifference to change, or in an active warfare on the ground of an imagined want of practicality in these movements; as though aught could be more practical than the training, and exercise in its self-appointed work, of the human mind, the centre whence radiate all practicalities. Surely it is useful to be able to distinguish

a peri-uterine tumor from a fœtal head—the dyspnœa of cardiac complication in Bright's disease from asthma. There are no diseases, save those of a strictly theological type, cured by wise or pompous looks, or even by the mere "laying on of hands," scrofulosis long ago having ceased to be amenable to the affluence of the royal touch. These reformatory measures, to be successful, need the coöperation of all medical men, and a full and hearty recognition of the fact that marked improvement in clinical instruction, or in therapeutical teaching, implies a more rigid ground-work of scientific training. Certainly the need is an imminent one so long as things knowable are as yet unknown, so long as the imagination must be invoked in explanation of causes purely physical, or the terms "spinal disease," "consumption," "bilious," "nervous," and "alterative," cover for us such a multitude of the sins of ignorance. "The human eye," says Carlyle, "sees in all objects that which it brings with it the power of seeing," and student eyes, trained in the results which science has arranged out of the invaluable but crude materials of united experiences, as expressed in best books, and in acute observations of the phenomena of bedside mysteries, growing achromatic at their work, see in new remedies, in all adjuvants of diagnosis, prognosis or treatment, not objects for ridicule on the one hand or mad overpraise on the other, but clearly defined desiderata, each with a value of its own, the measure of which only time can determine. It must be admitted that Science, studied either in a single salient aspect or in its entirety, can in no wise change the inherent power of its students, but it trains and moulds existing faculties. It cannot, as has already been said, "enlarge human capacity nor quicken human understanding," but it tends to elevate executive power to its maximum, and to reduce mistakes of belief and of action to the minimum.

"With *brains*, sir," said a famous painter, when asked with what he mixed his colors; and "with *brains*," I doubt not, would be the answer of any great physician or surgeon if asked with what he mixed his prescriptions. The science of optics may teach the painter the distinction between primary and secondary colors — the exact proportions that give in combination violet or brown or orange, but genius only can elaborate from these scientific details landscape or portrait. Chemistry will teach the student the laws of compatibles; Physiology, the broader laws of life; Anatomy, normal and morbid, the parts affected and how; still the ultimate appeal for adaptation of means to the ends of relief or cure must fall upon the brain of the prescriber — upon his personal sagacity. But the failure of any artist who should attempt landscape or portrait without some exact knowledge of the science of linear perspective and color, is as certain as to-morrow's sunrise. May not a like failure be predicted of any so-called Doctor of Medicine attempting cures without first studying and understanding, in so far as they are known, the laws of disease or the laws that underlie and control the substances and elements composing the broadest Materia Medica?