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THE HOSPITAL: AN ELEMENT AND EXPONENT OF MEDICAL EDUCATION.

An address delivered at the formal opening of the new Hospital of the University of Michigan Jan. 20, 1892.

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The marvelous rapid growth, which has spread its iron threads, as a spider's web, over mountains and valleys and mighty rivers, in fewer years, than the aeons of time, in which nature has channeled her water-courses—which builds a million-peopled metropolis upon a waste plain within a human generation—and which runs the gamut of social development from the ragged barefoot of the frontiersman's cabin to the cultured man of science, as a musician would a chromatic scale, may well cause one to pause in his intended teachings, who comes hither from the part of our country, which we, who live there, think so old—the narrow strip of coast-line whereon our forefathers rested with their children, before they began their giant strides towards the west. The courteous invitation to assist at the formal opening ceremony of this new hospital, coupled with the request to say something about the hobby I have ridden so often elsewhere—Medical Education—has fortunately saved me from the dilemma of attempting to enlighten where no enlightenment is needed, for in speaking of the hospital as an element and exponent of medical education, I have only to eulogize the work you have already done, and bear testimony to the practical demonstration in this place of the good fruit, which the well-cultivated tree of medical knowledge may be made to bear.

The institution and development of a great hospital are in fact the best fruit of that wider understanding, which comes from the higher education in medicine, upon which all its earnest and disinterested followers, in these days, insist. The hospital is the expression of man's tenderest sympathy for his hapless suffering brother, and it stands, with doors opening ever inward, to give the warmest welcome to him who is most hapless and most suffering. Gathering these helpless ones within its walls and inviting the solution therein of the most complicated problems of disease, it calls for the adroitest skill, the profoundest learning, the widest research and the most patient investigation. All these the great modern schools of medicine, in generous emulation, are now seeking to promote, and none with greater zeal and assurance of success than the University, under whose influence this institution has come into being.

Once upon a time, I believed, as all good Philadelphians were wont, and as doubtless many still do, that no good medical thing could come out of any but the Nazareth on the banks of the Schuylkill, and it was only grudgingly admitted, after many years,

that other waters on which the Eastern sun arose, might brew good beer, though not of course, quite so good as that which the fathers in medicine quaffed behind the red brick fronts of the quiet Quaker town, whose name of brother's love fitly types the spirit which moves men to enter upon the study of that greatest evidence of man's love for his brother man, which we call medicine. But, who among those reverend and revered fathers in medicine would have turned his eyes westward to scan prophetic sites of new temples to the Aesculapian god, on river banks and among forest wilds, where only red men were leading their simple lives? Yet, no laurel-wreath more worthily adorns the newer America of the West, than that which she has won, in her endeavor to make the culte of medicine pure and undefiled and to build for it temples where only the true faith—being the faith of truth—shall be inculcated, and of one such we are honored guests to-night.

If there be one truth, brighter than all others, which higher education in medicine has caused to be proclaimed as a gospel of "good tidings of great joy, which shall be to all the people," it is that the prevention of disease is the physician's first and highest office, and to the glory of the west, this sapling from the tree of knowledge there took firmest root and brought forth its first fruit in the shape of the splendid system of State Boards of Health, which have contributed so much to the health, strength, productive power, wealth and prosperity of this country, and of which it ought to be supremely proud. When no other of the original thirteen, or their eldest offspring, followed the lead of Massachusetts, whose eternal honor it was to have instituted the first State Board of Health on the 21st of June, 1869, it was California, youngest sister of them all, and from the extremest west, which took up the movement, to be followed by Minnesota and she by Virginia, with, however, but feeble ardor, the fifth in the order of sequence having been Michigan, which from the start acted with a vigor of purpose that has grown, year after year, until to-day her State Board of Health is one of the most able, most efficient, and most useful of those famous engineerings for stamping out preventable diseases, which have done more towards lengthening human life, improving the race, and increasing the productivity of the State, than all the drugs and drug-mills that have been in operation since its beginning. After Michigan, naturally came her nearest neighbor, Wisconsin, and of the eleven that followed in their wake, seven were also western organizations, among which Tennessee and Illinois have been especially note-worthy for energetic and beneficial sanitary action.

As a better understanding of the real scope of our sublime science has exalted preventive medicine to its high estate and led to the institution of the means for its application, these very means have themselves

come to be the instruments for weeding from the fair domain of our profession, the tares which have overgrown it, and for driving from the temple the money-changers and charlatans, by whom it has been defiled, dishonored and disgraced. It was in the west that the State Board of Health became the State Board of Medical Examiners and with peculiar appropriateness sought to exterminate, among the other preventable morbid agencies, that arch-enemy of the public health, the false physician. I have been for some years endeavoring to collect funds sufficient to erect at the National Capital a monument to the greatest physician this country has produced, the immortal *Benjamin Rush*, but the late Secretary of the State Board of Health of Illinois, whom I count also as among the great physicians of America, has builded his own monument in that splendid report on Medical Education, through which the State Board of Health of Illinois, became the van of the army of the west, and he its commander-in-chief, in the campaign against the host of medical pretenders, who have entrenched themselves in every town and village. A man of unostentatious habits, modest in demeanor, tireless in work as he was inconspicuous in his working, generous, big-hearted, beloved by all, a typical western man, if it may be permitted me so to say, John H. Rauch of Illinois, the animating spirit in this conflict, has fought a brave fight in the cause of medical education, and won a fame, which no epauletted hero could outvie, across the Atlantic as among his own grateful countrymen.

Were this audience exclusively of medical men, the subject of medical education would require no definition, since it is one—the prominent one—interesting the profession to-day, and while it cannot be claimed that the 106,000 members of the fraternity are a unit in their views, it is safe to say there are but two sentiments entertained respecting it—the one, that of the entire body of physicians who are themselves educated, and the other, that of the sciolists and smatterers, the pretenders and charlatans—and pity 'tis, 'tis true that the former are not numerically the greater. It might seem the discreeter part to keep this to ourselves as a family failing, but the cause of medical education can only be advanced by acquainting the public with its need, by candidly admitting that the designation "Doctor" is not *per se* the distinctive title of a man learned in the science and art of medicine, and by avowing, however humiliating the avowal, that the diplomated certificate in academic Latin that Gulielmus Smith or Johannes Brown "in medicinæ arte optime versatus est," displayed with college seal and broad blue ribbon in handsome frame upon the doctor's office wall, is not a patent of professional erudition and ability. It ought to be that by virtue of his office, the doctor in medicine should be the recognized superior in learning, culture and acquirements in every community, great or small, and that this is not so is the lamentable reason for the agitation of the subject of the higher education of medical men, meaning thereby their proper education.

What guaranty have you that the man claiming to be a physician is really one? He has a diploma, but diplomas have been bought, without the farce of sham tuition, and for a contemptibly cheap price. He is the graduate of a medical college, but there are colleges at which instruction is but a pretense, where no attendance is required, and where the chief solicitude

of the examiners for degrees is to ask a question or two that cannot fail to be answered—colleges where the size of the class is the ambition and the payment for the tickets the paramount concern. After a personal experience as a physician of almost forty years I do not hesitate to declare that the greatest danger I have dreaded for my family when going to strange places has been the unknown doctor, and I have always cautioned them that it were safer to run such risk as may be from doing nothing the one time in a hundred when something should be done than encounter the far greater peril of having that one thing wrongly done by some pretender, who does not content himself with the "yarbs" and roots of the country old-wife, but dabbles in potent pink pellets, of whose actions and uses he knows only what he gathers from their advertising wrappers. Hence the interest of the public in the thorough education of the men to whom their own and their dear ones' lives may be committed, and why they should understand just what is this medicine, which requires such skillful ministering. Certainly, it is not the mere mending of sores and bruises by plaster and poultice, the giving of sweats and purges, the fussy fumbling of the pulse, or the solemn inspection of the trembling protruded tongue, since any village Sairy Gamp is adept enough with healing balsams, and hits many a bull's eye, with "castor ile" and "hiery-pikry," or "bone-set," stripped up or down according to its intended working.

The minister of the body's health has as grave an office as the minister of the soul's welfare, for the *mens sana* can only reside in *corpore sano*, and his preparation for that office is serious without parallel, for to know that body well involves the study of the most marvelous intricate mechanism ever fashioned by the Divine Will, and to know how it lives and moves and has its being requires a thorough understanding of everything surrounding and influencing it—hence of everything upon the earth and in the air and in the waters, and off in the vast abyss of Cosmos. So, the physician, from the very etymology of his name, is the student of *Φύσις*, that beginningless and endless vibration of Omnipotence, which man alone among created beings has been able to comprehend, though only as through a glass darkly. It is in no invidious sense, that beside this stupendous study, the soul's guardian has an easier task, having only to teach the obligation to love the Lord God with all one's heart and soul and mind, and to love one's neighbor as oneself, and teaching this best in the simple phrase of the Saviour of mankind, rather than in the abstruse terminology of theological schools. The physician of the sin-sick soul has only this remedy, itself a spiritual one, to administer, to lift that soul to its highest possibility and cure it of every spot and blemish—believe and be saved; while the physician of the body has not only the pains and aches of the individual to combat, but those morbid tendencies and agencies which assail masses of men, communities, nations and whole races, subjected to the hostile influences of climate and the pestilential sequelæ of war, famine and drought, and this broad view of his sphere of action has been opened by that better medical education, which teaches that however perplexing the question of individual cases of disease, far more difficult and important is the problem how to banish disease from the earth, that human life may be lengthened, the

strength and vigor of the community be increased, the welfare, happiness and prosperity of the whole people be assured.

It needs no argument that men charged with such weighty responsibility should be thoroughly fitted for it, but let us think for a moment how doctors have been made—"M.D.'s," as they are familiarly termed from the collegiate distinction bestowed upon them at graduation—a distinction, one of the most honorable to which an educated man can aspire, for whether a *Doctor* in Medicine, or Law, or Theology, or Science or Philosophy, it signifies, as the diploma conferring it asserts, that he has become entitled to this high approval by study, by research, by original thought, or by invention or inquiry in one of these great intellectual pursuits. Had this been so, there would have been little need for insistence upon the better education of those entering upon the study of medicine. Men much younger than myself must have vivid recollections of medical schools of great pretension, whose benches were crowded by a strange company of young and old, from city homes and distant rural localities—a few fresh from college or academy, but the majority without sufficient preliminary education to enable them to take notes of the lectures to which they listened, but which they could not possibly comprehend. To such a one, the common technical language by which the anatomist described the first bone was an unknown tongue, and when, by dint of repetition, he had learned that *corpus* meant body, *foramen* hole, *sulcus* groove, and *articulus* a joint, he had to flounder among sterno-cleido-mastoidei, gyri fornicati and columnæ carneæ, or track the tortuous way of a pneumogastric nerve, chorda tympani or recurrent laryngeal. He might have recognized the "liver and lights" as old friends, but in an hepatic and pulmonary garb they were as strange to him as the "bones and sinews" when these became osseous and ligamentous. After an hour of jargon of this sort, he went to listen to another no less bewildering medley of atoms and molecules, crystals and salts, which were not salt. In my day, the Gordian knot of chemistry was not attempted to be untied. The chemical lecture was simply skipped, or if any youth were brave enough to try to learn by rote a few of the inorganic combinations of the common elements, he did not hesitate to draw the line at the organic compounds, which at that time did not rejoice in formulæ of C's, H's, N's and O's piled up in kaleidoscopic shapes as children make with building blocks. A third hour with another elementary branch, *materia medica*, only dazed him the more, by a set of nouns, adjectives and verbs entirely unlike those he had already heard. Was it strange he welcomed the relief from the Babel-tongued confusion afforded by the surgical amphitheater, where, if the blood-curdling operation did not cause him to faint, he felt assured he was born to be a surgeon, or he roamed with a crowd of others over a hospital ward and gazed curiously into pallid faces, or stupidly groped for the pulse in hot, emaciated wrists?

Two full courses of such a jumble of what are considered elementary branches, with a veneer of theoretical and practical medicine, surgery and obstetrics, the nominal dissection of a "part" or two, and a dangerously indistinct recollection of an operation or clinical demonstration, constituted the one time education of the physician. The making of doctors was a more or less profitable occupation, and the

trade spirit, which rejoiced in machinery that turned out a larger stock than rival concerns, infused itself into these mill-products, which were themselves only tradesmen from the start to the very end of their careers. To these, all there was of medicine was the money-making art, and shrewdness in business methods, which led to acquired wealth, became the ambition, rather than eminence for profound learning, varied acquirements, and skill in diagnosis, treatment or prevention.

Until recent years, the archives of the medical examining boards of the Army and Navy furnished almost the only incontestable records of the ignorance and incompetence of graduates of medicine, and their occasional revelations were attempted to be discredited by the statement that only those physicians sought the military service, who could find no occupation at home. But the institution of State Boards of Medical Examiners, and the organization of county and municipal health boards, requiring accurate returns of vital statistics, developed the amazing and incredible extent of the illiteracy in the ranks of the profession. There are now in Illinois two graduates in medicine studying the three R's on probation for licenses to practice. Indeed, it has been found that not a few of the legally created M.D.'s were as discreditable members of the profession as the self-styled "doctors"—many of the latter, in fact, possessing a native ability that made them superior to the graduate. I could occupy many hours with the recital of ludicrous examples by graduated physicians, who deliberately placed in writing the evidences of their astounding ignorance, but the mirth ceases, when you reflect that the day may come when the lives of your dearest relatives may be at the mercy of one such.

The argument against the legal interdiction of the license to practice medicine by uneducated physicians, on the ground that it is an interference with the inalienable right of an American citizen to follow any calling he sees fit, and in his own way, has been used to prevent the closure of the doors of medical colleges to uneducated matriculants, but a sufficient answer is that it is not possible for the average untutored youth to comprehend the teachings of the medical colleges of to-day, for though there have been John Hunters, who achieved the highest professional renown in spite of every early disadvantage, the phenomenal success of the one among many thousands does not justify those thousands of preventable sacrifices. Your own James Craig Watson, "whose name is known wherever an astronomer points his telescope to the stars," and who brought honor to his State and home, toiled till he surmounted every obstacle in his upward climb; but what higher peak might not he and others like him have reached, had they lost fewer hours of their brief lifetimes in this toilsome drudgery over the approaches to the unknown regions wherein they were to find future fame. The restrictions sought to be imposed are not in the interest of wealthy or aristocratic classes, since the University of Michigan announces as its annual fee "for Michigan students *twenty-five dollars*, for all others *thirty-five dollars*," and the Medical Department of the University of Texas starts out with professors whose official salaries range from \$2,500 to \$3,000, and who can consequently afford to be indifferent to the size and exacting as to the character of their classes; and this might be and should be the

case everywhere, were teaching faculties salaried, and examiners for degrees independent of them. Already "there are in the United States thirty-two examining and licensing boards that do not give instruction, and two in Canada."

The first step in the direction of reform in the methods of medical education was practically taken by the Committee on Medical Education of the State Board of Health of Illinois, which in 1880 reported in these words:

"It is too shamefully true that at present many students are admitted to the lecture courses whose illiteracy prohibits their profiting by the instruction given, except in the narrowest limits, and precludes the possibility of their attaining such knowledge as the duties of the profession positively demand.

"Natural talent and aptitude may go far toward fitting a man for any calling, but no talent can take the place of a thorough education in a profession where such large fields of knowledge are to be mastered, and so many and such important judgments are to be constantly and promptly formed.

"It is a palpable absurdity to expect to make skillful physicians of illiterate students by mere dint of reading them lectures, even when accompanied by quizzes and examinations."

This modest beginning of what was to become a mighty undertaking occupied only five pages of the Third Annual Report of the State Board of Health, and so was almost coincident with the establishment of the Board. The following year, the report of this same committee filled fifty-seven pages, and it has continued to increase in length and importance until the present year, when the seventh report of the committee has become a volume of 222 octavo pages, the most accurate, exhaustive and authoritative exposition of the status of medicine in the United States and Canada. From it we learn that there are 148 medical colleges in the United States, and of these 129 require certain educational requirements for matriculation, against 45 who did so in 1882.

It should be a matter of peculiar gratification to you in Michigan, that the Department of Medicine and Surgery of your University was among the first to raise the requirements for admission to its teachings, with unselfish disregard of its possible effect upon the number of its matriculants, and it is a matter for congratulation by your fellow-countrymen all over the United States to learn from the announcement of President Angell that, from this year, "it will demand a grade of preparation equal to that for admission to the scientific course in most colleges." Excepting the matriculants in course in literature, science and arts, and the graduates of literary colleges of good standing, and of a published list of diploma- and high-schools, every matriculant must be examined in English, presenting grammatical and rhetorical analyses of selections of prose and poetry, and an essay correct in spelling, punctuation and literary composition; in mathematics, as to arithmetic, and especially the metric system of mensuration, algebra and plain geometry; and in physics, botany, zoology, physiology, history and the elements of the Latin language. The list is so immeasurably ahead of what was, or rather was not, required, as to disarm criticism, but chemistry, and physical and descriptive geography and geology might well be added, to complete the equipment of the intending student of medicine.

Some of the prominent universities of the country, notably the University of Pennsylvania, Cornell, the Sheffield Scientific School of Yale, the College of New Jersey, Johns Hopkins, Northwestern University, and the University of Wisconsin have instituted special courses preliminary to the study of medicine and an attempt was made to establish a three years' course preparatory to the study of medicine at Ann Arbor. The scheme, unfortunately, did not succeed, but I understand it is proposed to establish a conjoined scientific and medical course of six years.¹

The requirement of a proper preliminary education of medical students is not all that is necessary for the improvement of the personnel of the profession. Two annual courses of lectures, the second a repetition of the first, and the nominal tutorage of a preceptor once constituted all the didactic instruction which was considered necessary to make the most illiterate bumpkin learned in medicine, and during the fifty years from 1830 to 1880, but little progress towards higher medical education was made. Ten years ago, only twenty-two colleges required attendance upon three or more courses of lectures before graduation; to-day there are eighty-five, and the duration of the lecture terms has increased from an average of 23.5 weeks (in eight colleges the time was only sixteen), to 26.3 weeks, one hundred and eleven colleges having terms of six months or more, when in 1882 there were only forty-two. The Chicago Medical College was the first in this country to adopt, by a vote of the faculty on the 4th of June, 1868, the three years' *graded* course, but up to 1880 there were only nine colleges in the United States that had adopted it, while in 1890, the number had increased to sixty-two, and the American Medical College Association at its meeting in Nashville, in May, 1890, adopted as a rule, governing the admission of colleges to membership: "That they shall require a graded course of instruction covering a period of not less than three courses of lectures of six months' duration each before graduation."

The movement for higher medical education has not stopped with this. There are "thirty-four colleges that now, or will soon, require four years' study and three courses of lectures, eleven that will require four years' study, and four that will soon have four courses." The course of study recommended by the medical faculty of Harvard University covers four years, although the degree of Doctor in Medicine continues to be given upon the completion of three years' study, the Degree of Doctor of Medicine *cum laude* being conferred upon those, who may have obtained an average of 75 per centum in examinations after completing the four years' course. McGill University of Montreal requires attendance on lectures for four winter sessions of six months each and one summer session of three. In the Department of Medicine of the University of Pennsylvania the course is graded and extends over three years. A four years' graded course is earnestly recommended and provided for but not required, as is the case with the Medico-Chirurgical College of Philadelphia, the Woman's Medical College of Pennsylvania and the Medical Department of Northwestern University. It was the University of Michigan which, declares her

¹ I have been told that this has since been decided upon, the degree of B.S. being bestowed at the end of the second year, and that of M.D. at the close of the sixth.

president, "decided first of all the medical schools in the country, to make four years of medical study a prerequisite to graduation." The annual announcement for the current year indicates in detail the systematic arrangement of lectures, recitations and laboratory work for the two semesters of the four college years of nine months each, which are so graded that the more elementary branches and the practical subjects are first taken by the student, the more advanced branches and theoretical subjects being presented later, so as to secure, as far as practicable, an orderly succession of studies.

The repetitional course so long the custom, has had its day, when first, second and third course students sat side by side, and listened to the annual iteration of elementary facts and the old jokes about the *sternum* and the *os tinea*, and saw the same old manikins and preparations at precisely the same period of the stereotyped course. They saw likewise the treasured specimens behind the glass doors of the museum cases, only a few privileged assistants to the professors ever handling the precious mysteries. Today, as you may read in the printed announcement of your College, the laboratory work required of every student, histological, physiological, bacteriological, electro-therapeutic, pathological, toxicological and pharmacological, must familiarize him by touch as well as by sight with every piece of the human mechanism, and with every agent and instrument that are ever brought in relation with it.

Doubtless others besides the twenty-one recalcitrant colleges that still require only two courses and have made no provision for longer study, are not in earnest in the cause of medical education and make such professions as they do, not in good faith, but the public will after awhile learn to distinguish between the sterling coin and its pewter imitation. "Possibly," says President Angell, with significant emphasis, "our numbers may for a time be reduced," and it is stated as a fact in the recent report of the Illinois State Board of Health, comparing the two periods of three years each of 1880-83 and 1883-86, that the most marked effect of the crusade against medical illiteracy was in Illinois, Indiana, Iowa, Michigan, Missouri and Ohio, which had 2,257 fewer students and 727 fewer graduates in the second than in the first period, although these States had gained half a million in population in the later triennium. In four States not so influenced, whose population had increased 833,784 in the decade, there was an increase of 1,487 students out of a total of 3,020 for the whole United States, in which the gain in population was over 12,000,000.

The American Medical Association, the representative body of the profession, adopted in May, 1847, what is called the Code of Ethics, embodying the rules guarding the conduct of physicians towards each other, to their patients and to the general public, and appended with but little hope of their adoption, articles upon the reciprocal obligations of patients to physicians, and of the public to the profession in general. Much of the quaint phraseology of this instrument is like that of the great Master in Medicine, Benjamin Rush, and on that account commands our respectful attention. It declares, "The first duty of a patient is to select as his medical adviser, one who has received a regular professional education. In no trade or occupation do mankind rely on the skill of an untaught artist, and in medicine, confessedly the

most difficult and intricate of the sciences, the world ought not to suppose that knowledge is intuitive."

And again: "The benefits accruing to the public, directly and indirectly, from the active and unwearied beneficence of the profession, are so numerous and important, that physicians are justly entitled to the utmost consideration and respect from the community. The public ought likewise to entertain a just appreciation of medical qualification, to make a proper discrimination between true science and the assumption of ignorance and empiricism, and to afford every encouragement and facility for the acquisition of medical education."

Consequently, the problem of medical education, besides the better instruction of the votaries of medicine, involves the enlightenment of the public as to what is Medicine. When some old spendthrift of his health fails to find relief from a long, ever-changing suite of medical advisers, the reproach is bandied, "For what are doctors good?" When at the end of a long career of toil, a retired physician exclaimed, "I am tired of guessing," captious critics reviled his life-work as all guess-work. When one who has outlived criticism is bold enough to say "I don't know," to an idle question as to the cause of some trifling ailment, he is contemned as ignorant and beneath the sciolist, who has a plausible pretext for everything. I fear that in the estimation of the public the medical man is little better than an artificer, who mends dilapidated human vessels, and that the chiropodist, the manicure, the bath-tender and the movement-curer, or to dignify them by higher sounding titles, the balneologist and kinesipath, are his noble brothers with offices scarcely higher, and this is partly the fault of the profession, which, with modest self-abasement, accepts the back seat among the audience instead of appearing upon the stage under the full glare of foot-lights and head-lights.

The betterment in methods of teaching medicine has not been brought about so much by outside causes as those inherent, for the public has not greatly concerned itself about the legitimacy of Doctor This or That. The spirit of progress in all science, which is characteristic of the Nineteenth Century, has possessed Medicine as all other departments of knowledge. The little oligarchy of six or seven professors, who ruled over as many kingdoms of medicine, have had their domains invaded by exploring vandals, who have enlarged their boundaries and set up new principalities, until now twenty to twenty-five is a moderate collegiate staff, thirty to forty not uncommon, and three famous schools, the University of Pennsylvania, Harvard and Columbia display respectively sixty-three, seventy-five and one hundred and six names of Professors, Emeritus Professors, Adjunct, Assistant and Auxiliary Professors, Clinical Professors, and Clinical Assistants, Instructors, Lecturers, Demonstrators and Assistant Demonstrators. Not even an academic lettered graduate in arts and sciences can hope to master all this diverse detail, of which parts only have been made their life-work by the brightest minds. As Art has its schools and masters of design and color, of landscape and figure, and Engineering has become only a family name for cousins innumerable, of which the youngest, electric engineering, promises to outstrip the rest; as Law has its votaries who walk within distant defined lines and limits; and even the followers of the lowly Saviour marshal themselves in unfriendly camps, so

has Medicine grown that great, that so many altars to *dii minores* have been set up, there is danger the great all-pervading spirit which makes of them a whole may be forgotten.

Thirty years ago, Professor Samuel Chew, in a course of lectures on Medical Education, declared that "a hospital forms a necessary part of medical instruction, and so necessary that without it no school of medicine can be even moderately well-qualified to do justice to its pupils." The University Hospital, whose formal opening we signalize to-night, is not only a material element of the scheme of education of this university, but it is the exponent of the excellence of that instruction.

The properly appointed, well-conducted hospital is a measure of the education and refinement of the community, as the thronged out-door dispensary is of its squalor and poverty. Troops of sore-eyed, pallid, emaciated women and children go to the latter for potion and salve, who most need bread and butter, milk and meat. There is little healing in the drops the poor mother's trembling fingers dole out to her suffering child, whose empty stomach and hungry blood are sorer evils than the sentinels of disease on body, limb and face. The hospital ward is both haven and heaven to the physically afflicted. Its inmate is the stranger treated as its guest—the *hospes*, whence its name, hospital—and its paronyms, "hospitable" and "host." The quiet room, the clean bed, the palatable viands, the gentle nurse, work wonders that drugs can not. An experience of many years in hospital administration warrants me in rating the dispensary as the least important of its appointments, the kitchen, the bath-room and the laundry all deserving precedence. The grimy skin often resumes its functions after the hot bath has removed its encumberment of dirt and disease. The nerves, jangled out of tune, cease their discordant impulses under the restful influence of quiet, and gentle sleep, the sweet, oblivious antidote to pain and suffering, comes often after the unaccustomed meal has given that wherewith the little body-builders of the blood may undo the evil the sufferer has done himself. The hospital is the home of the friendless, the porch of the church, from which they leave clean and clothed in their right mind, who entered foul and knowing not what they were impelled to do. There can not be too many of these blessed refuges for the lame, halt and blind, since, when well-administered, they place the sick of whatever class under the most favorable conditions possible for recovery; but no hospital can be well-administered without a large force of competent medical men, nurses and attendants, all of whom should be salaried with amply remunerative incomes. The hospital is not, in any sense, the rival or antagonist of the practitioner. Their lines are parallel, and far above the mercenary level on which the charlatan reaps his harvest. I cherish the Utopian hope that the physician of the future may be regarded as something more than a mere medicine-man; that he shall be what his name implies, the learned physicist—master in physics rather than physic,—profound interpreter of nature's laws, and skilled in the means for preventing their violation, whether by individuals or by States. The recognition of the importance of preventive medicine, and the prominence now given to hygiene at meetings of the national associations, in the local societies, and in medical journals; the fact that all but fourteen of the one hundred and

forty-eight medical colleges now have chairs of hygiene, when ten years ago it was only taught with more or less thoroughness in fifty-two; the admission of its paramount position among the universal medical sciences by eminent writers and teachers; and the testimony of great operators and practitioners, on the eve of their retirement from half a century or more of work, that the prevention of disease is the crowning object of medical science, all encourage the belief that the day is at hand when the sanitary counsellor shall be a potentate in the community, as with the family and the individual, and a man of authority in the councils of city, State and Nation. The health officer of the city and the health board of the State are coming already to be regarded as dignitaries of the highest rank, and meriting the highest consideration, and ere long there is certain to be in the cabinet of every nation a Minister of Health, or of the Public Health, with functions as imperative as those of the Ministers of Education, Agriculture, Commerce, or Public Works. The requirement of a thorough preliminary education, and of a graded system of instruction extending over not less than four years, will certainly exclude pretenders, and reduce the number of undesirable students until the men who shall receive their degrees *cum summa laude* shall be adequate for the various health positions of the whole country, for the administration of the hospitals, their annexes and dependencies, and for all the legitimate demands of private practice. There need be no fear that the physician's occupation shall be gone. The topic of the day in France is its depopulation, and the nation is looking for its salvation to the sanitary authorities.

With a wider field of responsibility and influence, demanding higher acquirements, there will be need for an army of health officials, sanitary inspectors, medical advisers, specialist practitioners, college faculties and hospital staffs, and the hospital physician and surgeon, like his prototype, the doughty Knight Hospitaler of St. John, should lead them all in chivalry, fidelity and address—and I doubt not the Knights Hospitalers of Ann Arbor shall be among the most courtly and most valiant of the order.

There has, in late years, been an outcome from the hospital which has introduced into the home sick-room something of the orderly method and thoroughness of hospital routine. The *trained nurse*, in pretty cap and apron, with her quiet self-possession, is a sugar-coating of sweet enticing that makes the bitterest pill palatable. A very priestess of Hygeia, her soft touch, her gentle voice and sympathetic smile equally subdue the fretful child, the querulous woman and the whining man. This University Hospital must make its School for Trained Nurses one of its prominent features, before it fills the measure of good it will do to the community which is blessed by its existence in its midst.

Entertaining the exalted opinion I do of the study of medicine, an enthusiast in my idea of its beneficence and prepotency, I may be pardoned for recalling the long succession of profound thinkers in medicine from the mythical son of Apollo, the "blameless physician" of Homeric times, down to that "beloved physician" of the first century, whose two narratives addressed to the most excellent Theophilus have not yet lost "their power in purifying and enriching the life-blood of mankind," and thence to the men we all know, who have glorified humanity by their benevo-

lent and too often ill-requited labor. To them it has been given to penetrate the mystery of man's existence, to show how the wages of sin is death, to denounce the blasphemy of ascribing to God's will all the misery and disease which ignorance, indifference and neglect inflict upon the human race. It is not God's will which incites the misdoings of each human atom, magnified by self-conceit into a giant, who is bruised and crushed by the mighty laws he has set in defiance; not God's will that the vesicle, to be some time man, endowed with the Divine impulse through which the masterpiece of creation is to be evolved, shall be freighted with evil tendencies — the taints, the blots and blemishes which ancestors to the third and fourth and fortieth generations have inflicted upon it; not God's will that the new-born child shall come into a world where everything it needs, light, air, water, food, are unstinted, to find the light darkened, the air poisoned, the water polluted, the food perverted, by man's own heedless acts.

It is the part of the wise physician to see beyond the mist and gloom of physical defilement that better living in which healthy men and women enjoy that highest possible happiness of well-being, engendering offspring in their own images, to be themselves parents of future vigorous races, and thus fulfill the Divine Will which put man upon the earth as the final effort of creation. May this University be the school in which such wise physicians shall find the inspiration for their noble work, and this Hospital the field on which their proudest victories shall be achieved.

A CLAIM OF PRIORITY. ATTEMPT TO COMMUNICATE ARTIFICIAL IMMUNITY.

BY ALBERT S. ASHMEAD, M.D.,
OF NEW YORK.

The following paragraph appeared in the *Medical Record* (N. Y.), Nov. 14th, 1891:

"Various attempts have been made by Richet and Verneuil, to transmit to man the exemption from tuberculosis, by injecting the blood of animals exempt, or supposed to be so, for instance, dogs and goats. Following out this same order of ideas, Dr. Bordier now proposes to transfuse the blood of indigenous negroes into non-acclimated whites, who intend to live in tropical countries, as a prophylaxis against yellow fever. It is not said that this proposition has been followed by any practical experiment."

This proposition of Dr. Bordier, that is, a similar and more comprehensive one, was made by me in an article which appeared in the *Medical Record* (N. Y.), Jan. 10th, 1891. It was entitled, "Racial Immunity and Inoculation." I proposed in it to transfer immunity, not from animal to man, but from man to man. I mentioned specially Japanese immunity from scarlet fever, and the immunity of negroes from yellow fever. Either, said I, we shall obtain a modified lymph by inoculating the disease upon an exempt individual, or the transfer of pure blood will transmit the immunity.

In a subsequent article published in the same journal Sept. 5, 1891, and entitled, "Inoculation of a Japanese with Scarlet Fever Germs. An Attempt to Obtain a Modified Lymph to Prevent Scarlet Fever in the Caucasian." I published the results of an experiment which I was then making.

This question was submitted by me to M. de Quatrefages. In his reply, this gentleman said that he was himself unable to give an opinion upon the matter, but promised to submit the subject of my articles to the *Académie de Médecine* where distinguished bacteriologists would examine, in a more competent manner, the merits of it.

As my correspondence with M. de Quatrefages took place before the proposition of Dr. Bordier is said to have been made, it is evident that the honor of having made it first belongs to me. I have claimed the recognition of this clear right of priority in a letter to the *Tribune Médicale*, of Paris, and also in a communication to Dr. Shrady, editor of the *Medical Record*.

I added, in both of these letters, that I had also transferred pure blood serum of a child who had had scarlet fever, and who, in consequence, enjoyed artificial immunity, to a child exposed to the disease. I was not, at the time, when I thus first mentioned my experiment, able to draw any deductions from my observations. But I have since transferred the pure blood serum of a boy who had had the disease two years previously, to his two brothers, actually exposed to the disease; these two children now, seven weeks after the transfer, are still intact.

These facts, although still incomplete and not allowing of a sure conclusion, I have had to mention, just because the merit of my proposition, whatever it may be, has been attributed to another man. I do not claim for them more importance than they deserve; but I do claim most seriously the priority of the idea which, made by me to the *Académie de Médecine* of Paris, through M. de Quatrefages, was afterwards made again, at least in part, by Doctor Bordier, Professor at the *Académie des Sciences*, of Paris, and ascribed to him, as its originator.

LECTURES ON GENERAL ETIOLOGY.

Delivered at the Chicago Medical College.

BY DR. H. GRADLE.

LECTURE II.

In order to understand the importance of the various conditions underlying infection and determining its occurrence, let us review what is known of the struggle between invading bacteria and the resisting organism. The first problem to be answered is: how do parasitic bacteria injure the tissues?

Their mere presence as foreign bodies is indifferent. It is well known that insoluble powders are tolerated in the living tissues without reaction. It has furthermore been shown by Wyssokowitsch¹ that any bacteria not pathogenic to the animal experimented upon are deposited in different internal organs when injected into the blood, and that the deposited bacteria are killed within some hours by the tissues. We must hence conclude that microorganisms can damage the animals cells only by their chemical action.

The poisonous effects of bacterial cultures, in short, of putrid animal fluids, were shown by numerous researches in the earlier part of this century.

Various observers, especially Parnum, obtained extracts from decomposed material, freed from living bacteria by heat or filtration, and with these chemical substances produced in animals forms of septic

¹ Zeitschrift f. Hygiene, Vol. I, p. 1.