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# MEDICAL EDUCATION.

8

EXTRACTS FROM LECTURES

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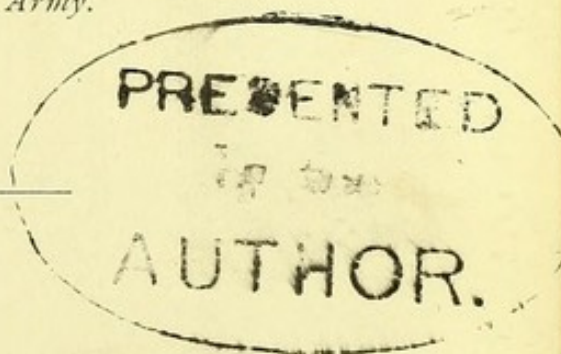
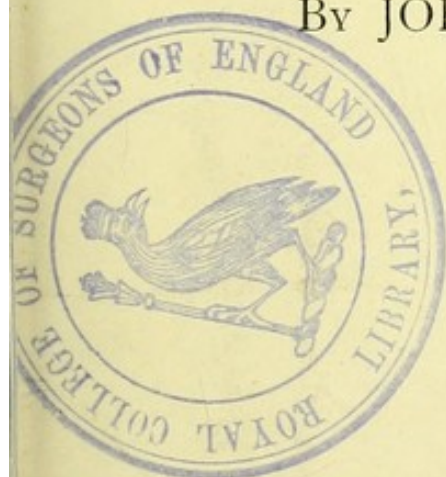
JOHNS HOPKINS UNIVERSITY,

BALTIMORE,

1877-8.

By JOHN S. BILLINGS, M. D.

*Surgeon United States Army.*

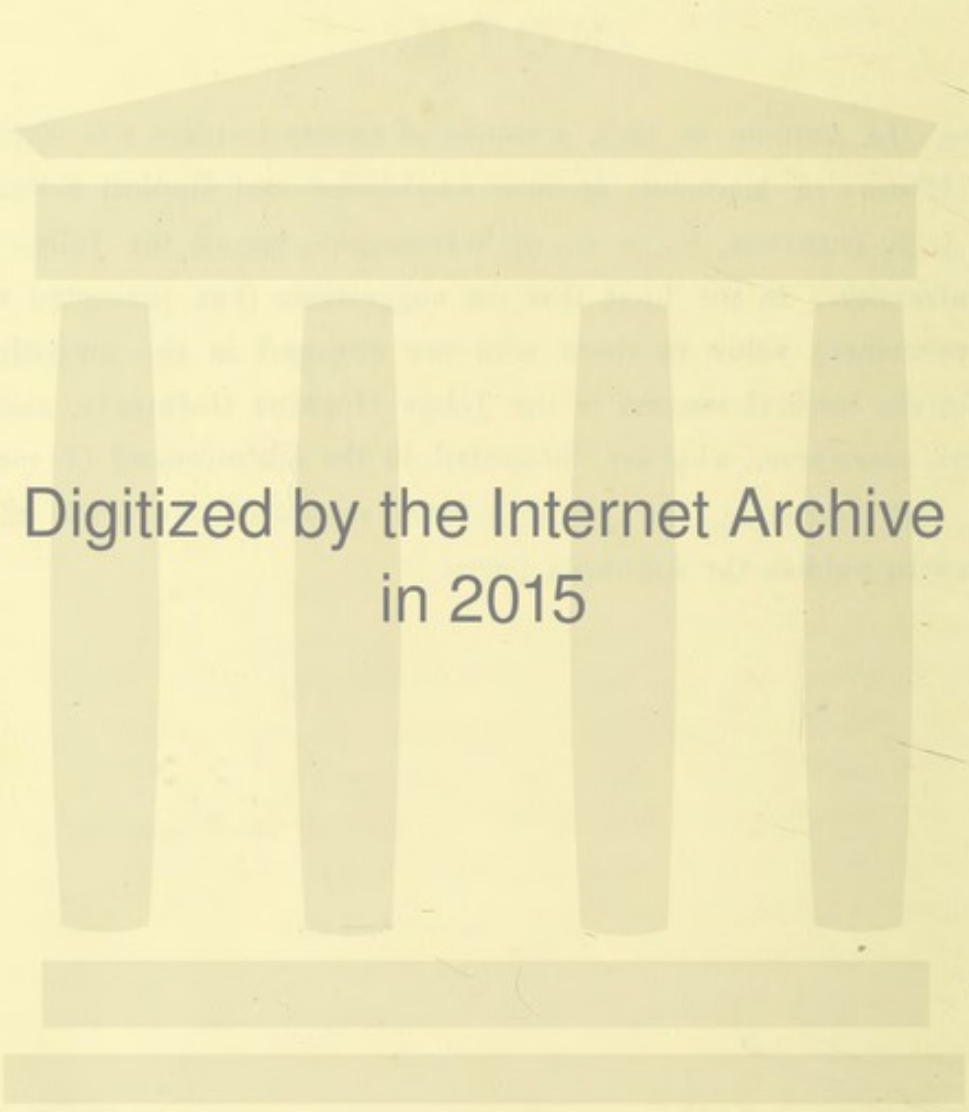


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# SUGGESTIONS ON MEDICAL EDUCATION

FROM A COURSE OF LECTURES BY

DR. JOHN S. BILLINGS, U. S. A.

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IN view of the present condition of Medical Education in this country, how should the Johns Hopkins University organize its Medical Department?

The course to be taken must be not only theoretically desirable, but practically possible, and in selecting it, the true interests of Medicine and of the Public are to be consulted, since they are the true interests of the University, putting aside pecuniary considerations. Another general principle which should be kept in view is, that in giving, an effort should be made to give not only that which is useful, but that which is least likely to be furnished from other quarters. Coals should not be carried to Newcastle as a gift any more than as a commercial speculation. In this eminently practical and money-making country, we should expect to find the schools organized with reference to the immediate pecuniary interests of pupils and teachers, and it has been shown that they are so organized. The demand made on this Institution is for something else; not a single person has advised the establishment of a school on the same plan as those already in existence. This is not saying, however, that the same purpose is not recommended, and in fact, nearly all the writers and speakers on Medical Reform, and those with whose advice I have been favored—ask that it shall make practitioners, better trained and more skilful than those of other schools, but still practitioners.

This is the object of the new course at Harvard, and at the Universities of Michigan and Pennsylvania, whose success in attaining it is not doubtful, and their example is certain to be followed by the other large Metropolitan schools as fast as they can obtain moderate endowments, for the very simple reason that it will pay. This is also the object of the French and English Schools, and I have given an account of the various methods proposed by them to supply the special needs of a young man who proposes to become a skilled practitioner.

Given a student with a fair preliminary education such as is required in all Continental Schools, what is his great and urgent need? From all sides comes the answer "Clinical Instruction," the study of disease on the



living subject. The sooner he can begin to profitably receive instruction by the bedside of the sick, or rather to instruct himself there, the better. Nothing can take the place of this; if it be not obtained before graduation, when errors can be prevented by the teacher, it must be obtained afterward at the expense of the first patients who present themselves.

To fit a man to meet the emergencies of general practice, this clinical experience must be wide and various, he must see many cases, and as many different forms of disease and injury as possible. It may be ten years after he begins practice, before he will see a case of strangulated hernia, or puerperal convulsions, or of labor with deformed pelvis, but when he is called to such cases, often in the night, at a moment's warning, nothing else can give him the skill and confidence, and power to help, which will be afforded by the memory of a similar case which he has seen properly treated.

An absolute necessity then to make the school effective in training practitioners, is abundance of clinical material—large dispensaries and hospitals in which men, women, and children, affected with all sorts of diseases and injuries are brought together.

So far as the Hospital is concerned, it must either have a large number of beds, or some means of moving patients rapidly through its wards, discharging them to institutions for chronic or convalescent cases, and filling their places with those of immediate interest. Even in the very large hospitals of Europe, it is sometimes difficult to provide that variety of cases requisite for teaching purposes, and where clinical teaching is almost the exclusive means of instruction, as for instance, at Vienna, the Professor has to establish very remote connections occasionally.

There will be a Hospital connected with this University, a Hospital which, I hope, will in its arrangements for the good of its patients, and of the school, be as complete as it can be made, but this Hospital cannot furnish clinical facilities for a great number of students, because it will not be large enough, and for other reasons which need not be given here.

It is probable therefore, that clinical advantages cannot be offered for the instruction of a large number of students, superior to those which can be furnished elsewhere, and hence that if it is undertaken to produce practitioners of medicine only, it can only be done on a small scale, and this would not be doing much more than other institutions are doing; in fact it would be to enter into a sort of rivalry, friendly of course, but still a rivalry with other medical schools.



The second existing demand is for the promotion of original research and discovery in Medicine, including the making known of these discoveries.

In this field, we do not find any organized effort being made in this Country. In no University or College, Hospital or Asylum, do we find going on systematic and scientific investigations in Physiology, Pathology or Therapeutics, such as are being made in Germany—and, less generally and systematically, yet still to a great extent and with good results, in France and Great Britain.

In the art or handicraft part of Surgery, we are doing very well; the mechanical ingenuity which leads to the contrivance of apparatus to supply the place of lost or defective parts of splints, artificial limbs, or teeth, or of tools to cut or dilate or break, needs no stimulation or encouragement. The reason is, of course, that these things, if successful, meet with immediate pecuniary reward; the good effected by them can be seen and appreciated by all. The case is different with researches in Vital Chemistry and Physics. To make these with prospect of good results requires much capital, capital in the shape of men selected for fitness for such work—in their training, which requires much more time than teaching how to cut off a leg or to bandage a broken arm—and in the shape of leisure, to work without being distracted by the necessity of labor for subsistence.

How much there is yet to be done in this field, can only be appreciated by the educated Physician, but we can all feel the force of the words of President Eliot; "Who of us but has felt at some hour of his life, that he would give all he possessed, if only the range of medical knowledge could be even but a little enlarged, if only it were known how this fatal membrane could be dissolved away, how this hemorrhage could be arrested, how this little clot in the brain could be absorbed." The following is the opinion of Leckey: "Of all the great branches of human knowledge, medicine is that in which the accomplished results are most obviously imperfect and provisional, in which the field of unrealized possibilities is most extensive, and from which, if the human mind were directed to it, as it has been during the past century to industrial inventions, and especially to overcoming space, the most splendid results might be expected. Our most absolute ignorance of the cause of some of the most fatal diseases, and the empirical nature of nearly all our best medical treatment have been often recognized. \* \* \*

But in the eyes of both the philanthropist and the philosopher, the greatest of all results to be expected in this, or perhaps any other field are, I conceive, to be looked for in the study of the relations between our physi-



cal and our moral natures. He who raises moral pathology to a science, expanding, systematising, and applying many fragmentary observations that have been already made, will probably take a place among the master intellects of mankind." (1.)

It is not a valid objection to undertaking such research, that results are doubtful, and that the best direction in which to work is not agreed upon. "Any road," as Professor Teufelsdröckh remarks, "will lead you to the end of the world." It does not matter so much where you begin to investigate, as that you begin somewhere and keep on.

The University must proceed on the supposition that its pupils are to be men of average ability, and not of extraordinary genius; men who will do work that is put before them, but who will follow the current which leads now here and now there, so that their work must be arranged and planned for them to a great extent; and it is also true that while it is generally admitted that the encouragement of original research is of great importance, the question of how to effect this, without running the risk of doing more harm than good, is an exceedingly difficult one. So impossible has it appeared to private or voluntary enterprise, that the aid of Government has been freely invoked to set it going and carry it on, and yet there are serious obstacles in the way of any Government which undertakes it, and these obstacles, in this Country, are so great, that at present, I do not see how they are to be surmounted directly. Indirectly, through the work of hygienic authorities, and the researches which they may be able to have made—through the formation of Libraries and Museums, and by stimulating higher medical education by offering good remuneration to medical men employed in government service, and by selecting the best men for such service as far as possible, our State and General Governments can no doubt do much, but the fact remains that there are very few places open at present for the man who wishes to devote himself to scientific work in Medicine. Rarely will he have the means and time to prosecute his studies, and if he has both, he will still lack the assistance, companionship and sympathy of men engaged in like work, which furnish that encouragement and stimulus so necessary to all but the very greatest minds.

Through a peculiar concatenation of circumstances, it is in the power of the Trustees of this University to do more for this object than can be effected by any Institution in this country, or perhaps in the world. They start

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(1.) Leckey, History of European Morals, Vol. 1, p. 166.



untrammelled by the customs and traditions which must be kept up in European Universities, they are not subject to the political necessities which would hamper the Municipal, State or General Government, they have the means to do what is wanted if the men can be obtained, and I believe they have the means to obtain the men.

When I look at the possibilities contained in the future of this Medical Institution, and remember the thousand and one questions which it might solve, and how surely these solutions would lead to other questions, which as yet are not even asked, much less answered; when I reflect upon how much in Medicine is as yet only conjecture and theory, with no firm basis of observation and experiment, and when in examining the medical literature of the day, I see how few thoroughly skilled Chemists and Physicists are really at work upon the problems presented by the living human body in health and in disease, and how slight are the probabilities that for many years to come any Institution in this country will systematically undertake work of this character,—I find it difficult to reason coolly and dispassionately as to what is best to be done, and to turn back and look at the practical difficulties which are likely to arise—and which must, as far as possible, be foreseen and provided for. I have so often seen, as the result of too exclusive contemplation of his single subject, a learned man, otherwise of excellent judgment, magnify its importance out of all reason, and set aside as of minor interest all that did not relate to it, have heard the students of the Classics, of Mathematics, of Philosophy and of the Natural Sciences, each advocating the claims of his own particular branch, to the comparative neglect, or even exclusion, of all the others, that I have been unwilling to accept my own first conclusions as to what should be the objects of this University, and have reviewed them, and discussed them with others as far as I could, trying to look at them with the eyes of a judge, rather than those of an advocate. The result is, that I must say that I believe that the Medical Department is the most important Department of the University. \* \* \* \*

In expressing the opinion that a prime object of the Medical Department should be the promotion of original research, I do not by any means wish to give the idea that this research is to be made mainly in the school itself. The object is to produce men fitted to make research, and who will take the habit of, and taste for inquiry which they have acquired here—into, we will hope, wider and more extensive fields of usefulness.

I presume no one doubts that such men are needed, certainly I do not know where many such are to be found; if I did, I should be able to make



much more definite recommendations than I feel justified in making at present.

While the prime object should be what I have suggested, there are other objects, hardly less important, which must also be kept in view, such as the training of teachers, and of men in certain specialties, including the education required for the medical services of the Government, which last is of the highest importance—and which I shall again refer to.

In the April number of the *Popular Science Monthly* for 1877, is a short article on *The Science vs. The Art of Chemistry*, by Prof. Remsen, which is intended to show that “the attitude of the world in general towards Chemistry is peculiar, and not what it ought to be, and that this is due to ‘its close connection with matters of every-day experience, and of practical importance.’” This gives rise on the part of the public to a purely material estimate of its merits and possibilities, which, in its turn, leads the chemist to seek applause and profit, by app’ying himself to the Art rather than to the Science.

In the same number of the same Journal, is an article by Prof. Clarke, of Cincinnati, on “Laboratory Endowment,” which looks in the same direction, urging more attention to the scientific side of Chemistry.

Now, precisely what these gentlemen wish to have done in Chemistry is what I wish to have done in Medicine, and I have no doubt that our real motive is at bottom the same. It is not that we wish to depreciate the value of the practical side of Chemistry or Medicine, but that we want a little more place and consideration for the scientific side.

We want it, because it is more attractive to us, and because, paradoxical as it may seem, we believe that the world will be greatly benefited by increase of knowledge, even when it has no practical application that we can see.

There doubtless is a Science of Medicine, nebulous and imperfect as it certainly is, and this very obscurity and imperfection are two strong reasons why I urge its claims to attention.

Just as to the geographer the most fascinating part of the map is that in which all lines disappear except those which in large type set forth “Unexplored Regions” so to the student who once fairly comprehends how vague and scattering our knowledge is as regards disease—no field seems more inviting for effort.

That the chances seem rather against than in favor of success simply adds to the attraction. This probability of failure applies only to the individual worker, and to the scientific man there can be no total failure, for the very



simple reason, that the work itself gives a certain and no inconsiderable amount of pleasure independent of the results. If you take pleasure in exercise, it does not matter so much that you did not find the thing you walked out to look for.

I do not think that there is the slightest need for fear that we shall not obtain valuable results ultimately from cultivation of the scientific side of Medicine,—but this culture should not be for the sake of the material results. As John Hunter once said in his rough style: “No man that wanted to be a great man, ever was a great man,” and it is often the case, that those who talk most about the exceeding value, and loveliness, and importance of science do not seem to think in a very scientific manner. Within the last ten years, I have had occasion to examine about two hundred essays and lectures written to prove that Medicine is a science,—and each of them has rather weakened than strengthened my faith in the truth of the proposition. There is a Science of Physiology, and a fair commencement of Scientific Pathology and Therapeutics, and combining these we get, not precisely a Science of Medicine, but the scientific side of Medicine; that which deals with causation or prediction as regards disease.

Scientific Prediction that is accurate, must be able to state the effects on a given set of conditions, normal or abnormal, by the addition of a new condition such as low temperature, or a given alkaloid or salt. And, as it is quite possible to study the phenomena of Life, both in Health and Disease, and also to study the effects produced in living bodies by chemical and physical agencies without reference to practice—it may perhaps be said, that this constitutes the Science of Medicine in opposition or contrast to the Art. Yet this science, if it be admitted to be such, is not to be studied apart from the art, and although we may not have the production of general practitioners as one exclusive or even main object, yet it must not be forgotten that they must be produced, and of excellent quality, in fact that their production is the necessary preliminary step to provide the material from which we hope to develop the other desiderata. A knowledge of the phenomena of disease is as important to the Physiologist, as is an acquaintance with Physiology to the Pathologist.

The course of instruction, therefore, must include all that is required for the education of Physicians, and more, it is not a diminution or substitution that I propose,—but additions, in order to give to the students an opportunity for selection, and to secure breadth as well as depth.



I have no desire to seem to depreciate the importance of Medical Practitioners, or of Institutions for instructing them. At some time in the life of almost every man, his comfort, if not his life, will depend on the skill and character of some physician, and if one will reflect on this fact a little, it cannot but seem strange that the public should not protect itself a little better than it does, against the grosser and more evident forms of imposture at least.

Nor in saying that if the Medical Faculty of this University shall devote itself exclusively or mainly to forming a superior class of practitioners, it will not be doing the best work, do I wish to be understood as saying that such work is not good, or of great utility.

But it will be as if the Professor of Chemistry should arrange all his teaching, with a view to making commercial analysts, or the Professor of Mathematics should try to concentrate attention upon those formulas for which some practical use can be seen.

What is desired is that the Medical Faculty shall increase knowledge,—and shall fit its students to increase knowledge,—and that its attempts to do this shall not be restricted or limited by the fact that a part of its work is to teach the practical applications of this knowledge. Let this last be the secondary and not the primary object, and by so doing, we shall be free to do, and shall have the means to do, work which is not only highly desirable, but which cannot be done elsewhere.

The Medical Schools in Boston, New York, Philadelphia, Baltimore and the West, are educating practitioners, and the supply is according to the demand. Improvements are already in progress, and will increase as the higher standard becomes remunerative. Now instead of entering upon any sort of rivalry with these schools, what I propose is, that the field shall be left perfectly clear to them, and that we undertake to do what they cannot do. Thus, this University can help them, and they can help the University, and without the slightest sacrifice of independence on either side, the Medical School (or schools if there must be more than one) of this City, and the Medical department of the University, can supplement each other's work, and thus attract to Baltimore, and supply the various needs of, Medical Students of all classes.

So far as the University is concerned, the more schools and teachers and educated men there are in Baltimore, the better—it matters nothing whether the teachers are called Privat Docents—or Extra Mural Teachers, or Professors in the Medical Schools—the more they can and will do, the more can



be left to them to do—and the University can devote its force to other work.

Having thus indicated what I think should be the objects of the Medical Department of this University, or rather the most prominent and important of them, the next point to be considered is how best to promote them. First then as to the students. What sort of students do we want?

Machiavelli, paraphrasing Hesiod, remarks that "In the capacities of mankind there are three degrees : one man understands things by his own light, another understands things when they are explained to him, and a third neither can understand them of himself nor when they are explained to him by others." (The Prince, chap. XXII.) Men of the last class are not wanted. Those of the first class are the men of genius who are few in number and can neither be created nor evolved. All that can be done for them is to provide opportunities which shall attract them, and to try to recognize them under the uncouth form in which, as in the case of Hunter, they may once in a century appear. The men mainly to be dealt with are of the second class. How are they to be selected? To what extent is it best, for the sake of the School and of the Public, to require that the young man shall have been educated before he is to be accepted as a regular Matriculant? It is agreed on all hands that our existing Medical Schools have no satisfactory standard, and that this University should set a good example in this respect. Attention has been called to the standards established in Austria, France, Germany and Great Britain, and also to those which have been proposed by the American Medical Association and by some of our Medical Schools. These last are lower than the Continental standards, but do not vary materially from the average requirements in Great Britain. They are all based upon the supposed requirements of Medical Practitioners, but I have proposed a somewhat different object, and therefore advise a different standard. If however I am wrong, and if making practitioners who can make their education pay, be the object, then I invite special attention to the remarks of Dr. Latham, for many years one of the best clinical teachers in England, who was educated under the old system of apprenticeships, and was thoroughly convinced that the modern tendencies in education were erroneous and should be strenuously opposed. I know of no clearer or more forcible statement on the side of those who like to call themselves "practical men," than that made by Dr. Latham. (1.)

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(1.) See London Medical Gazette, vol. xiii, 1834, p. 344, and British Med. Jour., Feb., 1864, p. 142.



I admit that the course recommended will not be popular with medical students, but I consider, not what they actually demand, but what they would want if they understood the question.

Very few of them can be expected to know what their true interests are, even if they propose to devote themselves exclusively to practice.

The majority of them propose to become Physicians in order to procure money, and suppose that it is for their interest to set up in trade as soon as possible. Moreover that course which is cheapest holds out strong inducements to them.

They cannot see that even from the commercial point of view only, as a matter of dollars and cents, it is better that they should obtain the best education possible. The public is not always sagacious, but in the long run it does somehow contrive to find out who are the skilled Lawyers and Doctors.

The badly and superficially educated Physician may for a time conceal his ignorance and unfitness if he will keep his mouth shut and refrain from putting pen to paper, but sooner or later the occasion will come when he must show what manner of a man he is, and when he comes into competition with a man who has been properly trained, he must almost invariably go to the wall. This can be appreciated, at least to some extent, by the Student who has had a proper preliminary education, and we do not often find such making the mistake of preferring cheapness and brevity in planning his course of Medical Study.

I must also remark that, if my advice be followed, some time must elapse before the good results which I hope for will become apparent. There will be no large classes, and it will seem as if the few men who will take the Medical Diploma are hardly worth the cost. These men, however, to use Holmes's metaphor, will be seed Capsules, and the results will appear wherever they go. I do not propose that the knowledge of Medicine which they are to acquire here shall be the end of their studies, but the beginning. It will be not merely a good, but the best possible foundation upon which to form Biologists, Naturalists, Psychologists, Sanitarians, Medical Jurists and Medical Officials of all kinds.

I would advise that the Baccalaureate degree of the University be made an indispensable pre-requisite to its degree of Doctor of Medicine. The wisdom of this advice depends upon the nature of the Diploma of the Doctorate to be granted.

If this can be agreed upon, it will simplify the problem very much, and enable us to answer with some precision the question what is to be the course



of instruction for the student who has fairly matriculated in the Medical Department? Admitting for the moment that means are to be provided for instruction in every branch of medical science, and for as thorough instruction in each branch as any one may desire, and also admitting the greatest freedom of choice to the student as to what he will study, it is still impossible for the University to shun the responsibility of fixing a minimum standard of qualification for its degrees: in other words, we must agree as to what is the least amount of knowledge which the authorities of this University, will accept as sufficient in a candidate in order that they may formally assert and certify that he is a Doctor of Medicine. In the first place what should be the nature of such a certificate?—is it to be confined to facts, or is it intended to be construed in a Pickwickian sense?

The granting such certificates, generally known as Diplomas, as connected with Academical Degrees, was in ancient times an important and highly valued privilege, and for a long time the degree of the Doctorate was conferred in accordance with its original meaning, that is, that the holder was qualified to instruct others, being equivalent to the title of Master, and it conferred the right to teach as well as to practice, and also exemption from taxation, and special privileges in trials, similar to those enjoyed by the clergy and nobility. In Medicine, as in the Arts, there were two degrees, and sometimes more, and in several European Countries to-day the licentiate is a different thing from the Doctorate. In the German empire this principle is carried out in recent legislation, and while the State grants the title of practitioner, the Doctorate is the exclusive gift of the University.

In this country the degree of Bachelor of Medicine has long since become obsolete, and licenses to practice are found in but few localities—while the Degree of Doctor of Medicine has among us become to a great extent worthless. It is not singular in this respect, since the same influences have affected all our Academic honors, and an American degree of A. M., or B. D. or D. D., does not in public estimation rank on an equality with the same degrees from an English, French or German University. This is true taken as a whole, for there are great differences in the value of American Degrees, but the adulteration has been so general and great that all have lost prestige.

It is no sufficient answer to this to say that our Universities afford as good facilities for the higher education as those abroad, or that many of our graduates are equal in culture to those of foreign schools;—what we are speaking of is the Diploma and the public opinion of its value, just as if we were speaking of our legal tender notes and their value in international currency.



Neither the bank notes nor the Diploma are of any value in themselves, but for what they signify.

The depreciation in value of our Diplomas, owing to adulteration, has been going on so long and is so much a matter of custom and precedent, that the issuing of such documents is no longer considered disreputable. The worthy Presidents and Faculties of the great majority of our Colleges and Medical and Divinity Schools would be greatly astonished and extremely indignant if they were told that they were engaged in swindling the public by passing off an article which is not what it pretends to be, nor what they certify that it is on their Diplomas, that they are engaged in counterfeiting and adulterating that which is, or should be, more precious to the public than its currency, that they are obtaining money under false pretences, and that their Diplomas instead of being merely laughed at, as they now are, should subject those who issue them to punishment severe enough to put an end to the production of such false certificates.

They would say—"we give such education as is required here, there is no demand in this country for such courses of study as are enforced abroad; everybody knows that our Diploma is only a certificate that the holder has had certain opportunities for study, and for that matter there never was, in any age or place, an institution of learning, the Diplomas of which could be accepted as meaning exactly what they expressed. The word Doctor has lost its original meaning and it is impossible to restore it, we can only use it in the sense in which it will be understood by the public."

There is even now however a great difference in the signification of Diplomas from different Universities, and we must ask—what do we propose that our Diploma of Doctor of Medicine shall really mean, and if this can be settled and agreed on, may it not also be possible to say in the Diploma what we really do mean.

In Degrees there is usually little or no gradation; all the holders are alike Doctors; equally learned and trustworthy; hence they must be based on a minimum standard, and it must be decided as to what is the least amount of knowledge and mental power that will be accepted as qualifying the candidate. If, to use the simile of another speaker, "the Diploma is to be worth its face in the currency of the world," this minimum standard must be equal to the highest, we must level up and not down. The possibility of variation in the Diploma is worth considering. I do not see any reason for refraining from giving a man a certificate that he is really skilled, it may be eminently and specially skilled, in Physiology or Pathology, while he only comes up to the



average in, for instance, practical Therapeutics. Of course only the broadest and most clearly marked characteristics could be thus indicated, but when it can be done it seems to me that the Diploma should be made more than a mere uniform, vague statement of general qualification.

I am of the opinion that the Diploma of Doctor of Medicine from this University should be restored to its old meaning,—that the holder is qualified to teach as well as to practice. I do not mean that full blown Professors are to be produced, but that the graduates shall be men who can when occasion demands tell what they know, and why or how they know it.

Having thus defined what the Diploma should be, we can perhaps consider the question of preliminary education in a light somewhat different from that in which the average Medical Student would be disposed to view it.

It is generally agreed that an important part of the work of preliminary education is to make the student acquainted with the uses and powers of his own mind, to train not only his hand, eye and ear but his brain, and it is probable that when the science of education or mental culture becomes a true science it will be founded upon a knowledge of the structure and functions of the nervous system.

For this purpose great aid can be obtained from the study of Botany, Natural History, and the Physical Sciences. If you wish to form an idea of the difference between ordinary and trained observation, take some plant, and having written out the best description of it that you can, compare your work with that given by a Botanist. You will probably be surprised at the number of points which you have failed to observe, and will begin to understand the difficulty which the Botanist would probably have in recognizing the plant from your description.

Another important means of culture of the faculty of observation, is by the study of drawing, and especially of foreground and figure drawing.

In the study of the human body in health and disease, it is necessary to be as minute as the botanist, and to have as clear and quick perceptions of small variations of form and color as the artist, and this not by a special effort of memory and will, but unconsciously and as a matter of habit.

The faculty of observation varies greatly in different persons; the great majority can see only what they are familiar with, and are looking for or expecting to see, but it is a faculty which can be greatly improved by cultivation—and in modern systems of education more and more attention is being given to this.



To no one is it more important or essential than to the Physician, and it should be systematically trained and exercised in his education.

Valuable however as are the faculties of memory and observation, they are only so as furnishing the materials for analysis, deduction and judgment. The mere collection of any number of raw-recruits will not make an army; in fact beyond a certain limit the greater the collection the more unwieldy and helpless and useless it is.

Now as Mill remarks, "The methods of getting at truth, and the tests of truth, are in all cases much the same. We can best learn how to ascertain truths by being shown the way in which it has already been successfully done. The processes by which truth is attained, have been carried to their greatest known perfection in the Physical Sciences. \* \* \* The models of the art of estimating evidence are furnished by science; the rules are suggested by science; and the study of science is the most fundamental portion of the practice."

Hence comes the immense importance of making the study of Mathematics, of the Physical Sciences, and of Logic, preliminary to that of Medicine. It is not only that the facts which will be thus learned are of importance to the Physician, but that he will by such studies be taught how to think, an ability which is much rarer than is commonly supposed.

The history of medicine is full of instances which learned and conscientious men have shown themselves utterly unable to appreciate the value of evidence; they could not see or understand things which to us appear almost self-evident.

I have said that graduates should be competent to tell what they know, and give reasons for their opinions.

The ability to do this, as well as to think accurately, and especially to reason inductively from particulars to general propositions depends very much on a knowledge of the right use of words. All have heard the saying of Hobbes, that "words are the counters of wise men but the money of fools." Mill remarks on this that the counter is much more likely to be taken for what it is by those who are in the habit of using many different kinds of counters, and that herein is the secret of the value of the study of languages, since it not only enlarges our vocabulary, but compels us to pay special attention to the meaning of words.

One of the main objects which I have proposed that medical students shall be trained to accomplish is the discovery of new truths, which implies that these truths are to be published;—to be made known for the benefit of all



the world. That they may meet with appreciation and acceptance when published, it is a matter of much importance that they should be properly presented, and as the study of science teaches how to think, the study of languages teaches how to express the thought.

I conclude then that no man is entitled to the degree of Doctor of Medicine who has not studied Latin and cannot read French and German with comparative ease.

In like manner it would be easy to show that Logic and all the other branches mentioned as required by the University for its Baccalaureate degree, are necessary acquirements for the man who is to be qualified to teach as well as practice. The study of medicine in our Medical Schools, even in the best of them, does not include these studies—nor does it supersede them, and I am unable to see any good reason why the presentation of a Diploma of M. D. from another school should be considered as at all equivalent to the Baccalaureate degree of this University. It is possible to present facilities for a post-graduate course where the student whose desire is to increase his information can select those branches of which he may stand in special need, but if his object is to obtain the Doctor's degree without limitations, let him come in through but one door—that of the Baccalaureate degree. If he cannot or will not do this, give him a certificate as to what he has studied and what examinations he has passed, a certificate that he is qualified as a practitioner if such be the case, but reserve the Doctor's diploma for those who have shown themselves fully entitled to it.

Great care however would be necessary in arranging the details of such certificates, for students, like electricity, will take the shortest path.

It is to be remembered that although this standard is proposed for matriculants, those who wish to attend special courses of lectures or demonstrations need not matriculate for that purpose, and as the curriculum of study can only be arranged so as to provide for the average amount of intelligence and application, it will be perfectly possible for the man of unusual talent and power to defer his matriculation as a medical student for one or even two years—until he obtains his degree in Arts, and to do this without loss of time so far as obtaining his Diploma of M. D. is concerned. I use here the ordinary phraseology, which implies that graduation or the getting a Diploma is to be the object of the student.

It follows that a student from another School, should be allowed to matriculate at an advanced part of the course if he shows himself fitted to do so, but that this matriculation always is on the condition that his preliminary educa-



tion is tested and found up to the standard, as well as his medical knowledge, and to this rule I would allow no exception. At the Harvard School a man who comes with the Diploma of M. D. is exempt from the preliminary examination, but I think such exemption not wise nor to be recommended in this case.

It may be said that unless this exemption be allowed, we cannot furnish such a Post-Graduate Course as it is desired that this Medical Faculty shall provide. The difficulty, however, is not in regard to the course, but the Diploma, and this question of the Diploma, I have already sufficiently discussed.

Supposing that the Students have been thus selected, what course and sequence of medical study should be advised or prescribed? In answering this we have to steer between the Scylla of too great rigidity and the Charybdis of indefiniteness. The fixing of a definite curriculum has very great advantages. The Student is usually incompetent to choose wisely, he cannot be expected to know his true interests, and as a matter of fact he does not know them. The average Medical Student does not like to think for himself, or to attempt to definitely state his own opinions, preferring very much to fall back on and quote those of his preceptor or his text-books, and if left to select his own course of study he will almost certainly not do it from an independent standpoint, but in accordance with the advice of others.

Again, there is an advantage in having a certain order and succession of studies. At certain periods of life certain studies are best mastered, as expressed by Temple, Sermons, Sec. II, Sermons, XL, p. 308, 1871: "There is but a certain time allotted for each thing to be done that we have to do, whether it belongs to this world or the other, and if we pass the allotted time it is too late for that work to be done. If you are idle at school, it may for a short time make little difference, perhaps no perceptible difference at all. But after a time it becomes too late to recover what you have not chosen to take when it was within your reach. There are things which can be learnt when you are not twelve which can never be learnt so well afterwards; there are still more which must be learnt before you are seventeen or eighteen, or you can never really learn them at all."

It is proposed that the Medical Students of this Institution shall be better educated than the average, and therefore rather more competent to select for themselves, while it is in accord with the enlarged freedom of University Life that they be allowed to make such selection. It will be found necessary,



however, to provide a scheme of Study, even if its adoption is to be only a matter of advice and not of command. \* \* \* \* \*

What is the course of instruction to include? There are those who favor limiting the number of subjects to which the Student's attention is to be directed, in order to secure a thorough comprehension of those which he does undertake, and this is urged on the ground that within the last fifty years the Science and Art of Medicine have undergone such great development, and that there is so much more to be learned now than there was when the present systems of instruction were established, that it is impossible for the Student to survey the whole ground, and acquire more than a superficial knowledge of any part. But is it true that the Study of Medicine has become more difficult because our knowledge has increased? Has the study of Physics become more difficult since the discovery of the laws of gravitation or of the correllation of Forces? Every new discovery in science which leads to the formulation of a general statement or law expressing the result of combination and comparison of many facts previously scattered and isolated does away with the necessity of remembering most of these facts, and of learning a number of unverified and conflicting hypothesis.

It is true, however, that the student who wishes to qualify himself to be a general practitioner cannot pursue with thoroughness many branches of study, and must select those to which he will give special attention, and those of which he will learn only the outlines and general principles. This applies to a still greater extent to the man who desires to carry on a particular form of research, but as the selections made will not be uniform, but will vary with the tastes and wants of each individual, it follows that facilities must be provided for instruction in all branches, and for special and detailed instruction in some departments.

Admitting, then, that all the usual branches of Medical Education are to be provided for, in what order should they be distributed? And, first, should the student be required to undergo a certain amount of instruction and training before admission to the actual study of disease in the living subject—that is to clinical instruction? I have already called your attention to the remarks of Dr. Latham on this question, as summarizing clearly and forcibly the views of those who think that clinical instruction should begin at the very outset of the student's career. In certain rare cases this is perhaps best; there are men who will be led to investigate and to work in this manner, who would do very little with the theoretical branches, but for the majority of students I believe that the views of Dr. Latham are incorrect.



Some men may be taught to swim by dropping them at once into deep water, but many will be drowned in the process.

The demand for clinical teaching is a reaction against excessive or exclusive use of Lectures as a means of giving instruction, and a reaction which is natural and justifiable.

But while Demonstrations, Recitations and Laboratory work should be largely employed, Lectures are not to be given up entirely, since they are of great value to the student as saving him a vast amount of laborious research and reading, and are of great use to the Lecturers themselves, as a test of their comprehension of a subject, and of their progress in it, for one can never be sure that he thoroughly understands a thing until he has tried to teach it.

In this mixed system the objections to a separation, at least in part, of the clinical or so-called practical teaching do not apply, and this separation has so many advantages, and in the present case is so essential, that I think it must be accepted. The time which may be profitably devoted to the study of Anatomy, Physiology, the applications of Chemistry to Medicine, *Materia Medica*, and the general principles of Pathology and Therapeutics is usually considered to be about two years, and the arrangements for teaching these branches should be made with reference to that time. With regard to the details of methods of teaching and demonstration to be used in these several branches, it would be of course useless and improper to speak here, but I wish to call special attention to what I consider a very important means of promoting the study of Pathology and Pathological Anatomy, which can be introduced with great advantage in the second year of the student's course, and that is the establishing a course of study of comparative medicine, with clinical facilities such as could be afforded by a small establishment for the cure of diseased animals.

Such a course would serve a double purpose. Considered with reference to the welfare of our domestic animals, and to the pecuniary interest which these involve, the study of veterinary medicine must be admitted to be of great importance, while in this country it is certainly very insufficiently attended to. •

The loss of domestic animals in the United States from disease and injuries is estimated as amounting to about \$100,000,000.00 annually, and it is probable that one-fifth of this might be saved by proper precautions and treatment. I do not at the present time know of any career which holds out greater promise of usefulness, reputation and wealth than that of Veterinary Medicine in this



country as it might be made if taken up by a few thoroughly well educated gentlemen, starting from the basis of such an education as the holder of the Diploma of Doctor of Medicine from this University should have.

I do not think that Veterinary Medicine studied by itself, as is the custom even in the best foreign schools, can ever give satisfactory results, any more than will the study of Obstetrics or any other specialty alone.

I do not know of any institution in this country to which I can point as an example of what I would recommend, and upon the principle of trying to do what others cannot or will not do for education, this is an additional reason for attempting it here.

The relations which exist between the diseases of men and of the lower animals present a series of problems which as yet have hardly been posited—much less answered, and the investigation of which can be profitably undertaken only by those who are acquainted with both comparative and human medicine. As I have before said, one of the things which medicine now needs most is the study of pathological processes, instead of pathological results, and it is to institutions properly fitted for the study of diseases, natural or artificial, in animals that we must look for help in this direction.

It is also in this field that we may hope to discover something with regard to the application of the laws of evolution to Pathology, an application which must certainly exist if the theories of Darwin and Spencer be correct.

It is not, however, so much with a view to the importance of the promotion of the study of Veterinary Medicine for its own sake, important as this is, that I propose its introduction into the medical course, as for the sake of the great amount of instruction which by its means can be imparted to the student before he is brought face to face with disease in the human subject. Even from the lowest point of view, that of its furnishing material for the study of the chemistry of animal fluids, healthy and diseased, and of the results of disease in the various tissues and organs, it is well worth providing, and when we look to the higher object of this University, the promotion of research, it is evident that the facilities which an institution devoted to the diseases of animals would give will be of so high a degree of importance that it may be said to be absolutely necessary that they shall, in some way, be provided.

When the student has progressed so far that he can prove himself fitted to begin his clinical studies he should enter on the second part of his course, and commence the study of disease on the living subject in the Dispensary



and Hospital. With the training which he has received he will find this part of his course exceedingly interesting and comparatively easy.

The proper organization of the clinics for the Medical Faculty will probably be found to be practically one of the most difficult points to settle at first.

In this connection a scheme proposed by Prof. Ziemssen for the organization of the clinics at the University of Erlangen, will be found interesting. The number of medical students did not exceed one hundred, and of these the number for whom clinical instruction was to be provided was about 50.

For the medical clinics for this number Prof. Ziemssen thought that there should be a professor of the propaedeutic clinic and clinics combined, with two assistant professors, one for diseases of the chest, the other for Laryngoscopy, Medical Electricity, &c. Besides these, three junior physicians resident in the Hospital, being recent graduates, were to conduct the pupils, divided into small parties, through the Hospital, and instruct them in the examination of the cases. Besides these there would be the surgical clinic, with its special branches of diseases of the eye, skin, etc.; the obstetrical clinic, that for disease of children, and for mental and nervous diseases, so that for the clinical instruction of fifty students, there would be required four or five professors, and from five to ten assistants, besides resident medical officers.

In Germany and France we have seen that the clinical teachers belong to the Faculty, and the Hospitals are more or less under their control, at least so far as the clinical wards are concerned. In England the clinical teachers belong to the Hospital, and the school takes a secondary place as an appendage to, and protégé of the Hospital. In American Schools there is much variety—some have their own Hospitals and Clinics—as the Philadelphia Schools, others depend upon City Hospitals, which may even be shared between two or three schools, but the general rule is that the Clinical teachers are dependent on the Faculties.

In the case before us the circumstances are somewhat peculiar. The Hospital is a totally distinct trust from the University, having its own funds and officials, yet it is to form a part of the Medical School.

The question of funds would probably decide the question as to whether the clinical teachers should be more immediately dependent on the Hospital or the University, but of course they should be perfectly acceptable to both, and the responsibility must be to a certain extent divided. It is the University which is to grant the Diplomas, which is to certify as to the quality of the results, and which is to be responsible for the character of the clinical teaching after it has once put its seal of approval on them. The clinical



teachers must therefore be such men as it approves, and in whose judgment it can trust. How far it may have to trust will depend upon the organization of the Board of Examiners.

Even those Professors in the Medical Faculty whose duties are not purely clinical, must have more or less to do with the Hospital and Hospital Staff. The teacher of Pathological Anatomy or of Pathological Chemistry, must keep in view therapeutics and diagnosis as well as his own special branch, and must be familiar with the latest advances in these subjects or the value and interest of his work will soon begin to diminish. In so far as the teachers are students, and students they must be—the Hospital is their special field of study.

So far as the Hospital is concerned I presume that while affording the facilities referred to, it is not in any way to be an appendage to the University. It has its own work to do, and it is desirable that it should obtain the credit for it.

This Hospital is to contain 300 beds, and is to have connected with it a convalescent Hospital of about 100 beds.

It is also to have a large dispensary or polyclinic, and an amphitheatre connected with both the Dispensary and the Hospital. The Dispensary has been arranged with a sufficient number of rooms to permit of a minute classification of patients and of ample facilities for the teaching of special subjects. In connection with it I hope that it will be practicable to establish a system of medical attendance upon the poor at their own homes, a large part of the work of which can be done by advanced students under the advice and direction of the Clinical teachers.

This will be especially important for giving practical instruction in Obstetrics and in the diseases of children. The Pathological Institution of the Hospital will have its own Amphitheatre, Laboratory and Microscopical rooms, and will be so arranged that each student can work there to his heart's content.

The Hospital is planned to provide for the residence of about 25 students, besides the Medical Officers proper, and these students are expected to conform to Hospital discipline, and to take charge each of a certain number of beds. To this number of 25, I think that the number of the graduating class should be limited, and that every student should be expected to spend his last year as a resident in the Hospital in the study of the practice of Medicine and Surgery. Under proper direction, he should have cases assigned to him for investigation and suggestion of treatment, he should be charged



with the carrying out of the minutiae of the treatment approved and ordered, and he should be required to report these cases in a satisfactory manner.

In succession he will thus pass through the various wards and departments of the Hospital, and under the instruction of the several clinical teachers. The fruit of his previous studies will now become manifest, and we may reasonably hope that it will be good fruit. With regard to this recommendation of requiring every graduate to have resided one year in Hospital, and the consequent limitation of the graduating class to the number of 25, it should be considered in connection with the previous recommendation that the Baccalaureate degree of the University be made a prerequisite for the degree of Doctor of Medicine. Call this last recommendation No. 1—the limitation of the class recommendation No. 2.

Now I find that those Physicians whose opinions I have been able to obtain, and I have obtained those of at least one hundred, may be divided into three classes. The first approve both recommendations, the second approve the first recommendation but not the second—thinking it unwise to limit the number of students, as they believe that in a few years, when the value of this course of study becomes recognized, the number of properly qualified applicants will be so great that it will be necessary to refuse some, if the number 25 is to be insisted on—and the third class disapprove of the first recommendation, thinking the standard so high that very few candidates will present themselves, so few in fact that there will never be any necessity for the limitation in number, and that the results obtained will be by no means commensurate with the cost of keeping up proper buildings and an adequate staff of teachers. This last objection is the really important one, it is one the true value of which cannot be ascertained without trial, and one upon which the optimist and the pessimist will continue to hold diametrically opposite opinions.

The objection to the limitation of numbers does not seem to me important—I think it will be many years before the number of 25 for the graduating class can be reached, and when it is reached I am quite sure the time will have come to raise the standard.

It will probably be as desirable then as it is now, that there should be some institution in this country where superior facilities for, and incentives to, medical study and research can and will be provided, and such facilities will imply the exclusion of men not fitted to profit by them, in the year 1977, as much as they do to-day. When the material for Clinical instruction which the Hospital and Dispensary can present increases beyond the limits at pre-



sent contemplated, as no doubt will be the case, it will be time enough to discuss the question as to whether this increase shall be made use of to improve the quality, or enlarge the quantity of the product of the Medical Department.

With regard to the precise position of the Clinical teachers, it appears to me that if the financial situation permits, they should be employed by the Hospital, should be a part of its Staff, and that the results of their investigations and labors, so far as the advancing of our knowledge of the signs and treatment of disease is concerned, should be published by the Hospital.

Into the details of such an organization it is unnecessary to enter here, and much variation is possible, as is evident from an examination of the systems pursued in the various Hospital Medical Schools of Great Britain. The only point which I need here allude to is with regard to the means of testing the knowledge of the students.

How many examinations should there be, and at what periods?

These are usually regulated by the time which it is supposed proper to devote to certain subjects, and it has become customary to estimate the efficiency of a curriculum by the time bestowed upon it.

The great majority of students will work better under the stimulus of class companionship, and while time is a secondary matter here it is still an important one and must be considered.

The general opinion among medical men in the United States, Great Britain, France and Germany, is that the period fixed for medical study in these countries is too short. This period varies from two to five years. In Europe the opinion is very general that six years is required to fit a fairly well educated young man to undertake the responsible duties of a practitioner. I presume that a few of those possessing the Baccalaureate Degree of this University could probably accomplish the course of medical study indicated in about three years, but that the majority would find four years requisite for this purpose.

It is unnecessary and undesirable to fix directly any limit of time for study, but it is desirable to divide the examinations, and to classify them, somewhat after the continental methods.

For instance, there should be an examination at the end of the first year's course of study, in part to get certain subjects out of the way—in part to prevent the student from idling away his time under the impression that he can easily make up the deficiency in succeeding years,—a delusion which is very common. It is evident that before the student begins his clinical studies he



should be examined in order to ensure that he is fitted to take advantage of them, and the examinations for the degree are a matter of course.

How should these examinations be conducted and by whom?

In giving an account of the various complaints that have been and are being made about our existing systems of Medical education, it has been pointed out that one cause of dissatisfaction is that the examination of Medical students is conducted solely by those who have been their instructors, and that there is a demand for a separation between teaching and examination. It is thought that as defective scholarship implies to a certain extent defective teaching, the Instructors will naturally be unwilling to condemn their own work, especially as their pecuniary interests are involved. This last consideration may have no force here, nevertheless it is well that the public should have some definite information as to the kind of instruction that is given, independent of the statements of teachers and pupils. To effect this it is by no means necessary to take the whole business of examination out of the hands of the teachers, and there are serious objections to doing this. It is desirable that there shall be the least possible difference between the study required for obtaining a satisfactory knowledge of the science and Art of Medicine, and that required to pass the examinations. But when the examination is conducted by some other person than the teacher, the student will always keep in view the possible questions which may come up not relating directly to his course of study and will attempt more or less cramming, as it is called, in order to be prepared for the emergency. As remarked by Prof. Jevons, "it is a matter of common experience that successful teachers usually make the best examiners, in fact examination in some shape is an important part of the business of teaching itself."

The examination at the end of the first year's study can certainly be conducted satisfactorily by the Professors under whose immediate charge the student has been together with the Professors into whose departments he is about to pass. In like manner the clinical teachers should be represented at the testing of the fitness of the student to commence clinical study. At the final examination the public should be represented by some persons independent of the University and qualified to judge of the general results.

It is evident that the more we rely upon examinations, and the less stress there is put on other evidences of study, the more extensive and the more carefully arranged must be the system of tests, and the more time and labor they require on part of the examiners. This time and labor should be paid for by the candidate whether he succeed or fail, for it will have been bestowed



in either case. The system of refunding in case of failure is unjust, and I think it has a bad effect on all institutions which adopt it.

The object here should not be Diploma granting, nor the setting up of an examination shop—it is to furnish the means of instruction. If a man who has graduated elsewhere wishes to add the Johns Hopkins diploma to his trophies, let him try on the same terms that its own scholars try. The requirement of one year's residence will be necessary however to secure a satisfactory examination.

Thus far we have had reference mainly to the usual work of a Medical School; namely the teaching the fundamental principles of Medicine and the allied sciences. Another purpose has however been indicated, which requires a little farther explanation. An important peculiarity of the German University Systems, and one which to some good observers appears to be the main cause of their prosperity and reputed excellence, is the fact that the Professor, Assistant Professor or Privat Docent is expected not only to be familiar with, and to teach fully and clearly that which is already known in his own special branch; but also to actually increase knowledge in that branch by observation and experiment. This is especially insisted on by Prof. Billroth, who characterizes these Universities as combining the functions of a school and of a learned society, and claims as a result that the teaching partakes of the spirit of inquiry, and that the better class of pupils, becoming imbued with this spirit, not only make more substantial progress in their studies but are often valuable Assistants to their instructors. That there are certain dangers in this system he sees clearly enough, and he points out that the Government has the right to demand that the people shall be supplied with competent and trustworthy Physicians, and as it is the business of the Universities to produce these they must not allow the Society to predominate over the School in their method of work. He says "The adjustment is difficult but not too difficult for German Strength." (1.)

The two functions thus indicated are nearly identical to the student who is sufficiently advanced, for he can understand that the proper period of study is co-extensive with the life of man, but there is a danger lest those who are yet properly subjects of guidance should give one of these functions undue prominence over the other.

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(1.) Billroth, Th. Über das Lehren und Lernen der Med. Wissensch. Wien 1876, 8°.



In our existing schools, the function of research has been almost totally neglected, but in endeavoring to supply this omission care must be taken not to go too far to the other extreme, lest in trying to promote science we neglect education. The practical question before us is in what way can the body of teachers and students who will be gathered here—best advance our knowledge of the causes, symptoms and treatment of disease, keeping in view the fact that the necessary course of instruction for a Physician is to be maintained, and indeed to be made a means of attaining our object?

We have seen in the history of medicine that all substantial progress has been due to observation and experiment, but that these last have often been stimulated or induced by theory.

A great obstacle to Medical progress, until within comparatively recent times, has been the fact that co-operation in labor was hardly practicable. Now while there are many problems which an individual may profitably attack, there are many others which require the united observations of many persons to give good results. In speaking of the statistical method of Louis, attention was called to the necessity of a large number of observations on any particular disease in order to reduce the mathematical probability of error to such a degree that the general results shall be valuable; and the very great difficulty which exists in obtaining observations which are capable of being compared statistically was pointed out. One very important means of promoting Medical Science, then, is by teaching young men how to observe, and for many, in fact for the majority, this must include teaching them what to observe.

The majority of men are by nature incurious,—and yet most persons, if set to work on a clearly defined question, will strive to answer it. The art of asking such questions is however a special one, it requires not only knowledge, but a certain reaching out beyond knowledge. It usually happens that the man who possesses the faculty of doing this does not give his questions to the public but strives to answer them himself, and no doubt he is more likely than another man to obtain an answer.

Yet on the ordinary principle of division of labor, it would seem probable that more might be accomplished if the questioner could place his problems in the hands of those who, though incapable of originating them, may yet be able to solve them.

I may put the same idea into another form by saying that valuable aid and stimulus to advancement of science may be given by defining and marking



out as clearly as possible what we do not know, and this not in general propositions but in particular instances.

To illustrate my meaning I will refer to a recent text book on Physiology by Professor Michael Foster of Cambridge.

One of its peculiarities is that in each section, what may be considered as satisfactorily proved is separated from that which is merely probable, or which rests only on the statements of an individual, and in this way almost every page is suggestive of work to be done, work with a definite end and purpose, which cannot fail to give valuable results.

A similar series of suggestions for observations in Pathology and Pathological Anatomy is even more desirable than in normal Physiology, for the reason that nature's experiments on the human body cannot be repeated at will, like those in comparative Physiology, and the phenomena must be observed as they chance to occur or not at all. I shall have occasion to speak more fully on this point hereafter, but I think it is evident that it will be good work to teach our students as far as possible, and in as much detail as possible, what are the points upon which further information is necessary, "to give them a list of desiderata," as a Librarian or Museum Curator would say.

In commencing this course of Lectures I had occasion to remark that the history of Medicine forms no part of the course of instruction in English and American Medical Schools. It is true that occasionally a few lectures on this subject have been given at one of the English Universities, but in this country nothing of the kind has appeared since the lectures of Dr. Dunglison forty years ago. Such lectures are given in France and in some of the German Schools, and they form a part of the course advised by Professor Billroth, but even in France and Germany there is much question as to their utility. The doubt is as to their real service to the practitioner, and as to whether the student who is qualifying himself to become such can properly spare any of his limited time to attend to this subject. It is said that each Professor will give in regard to his own subject all the Historical information which is of any practical value, and that for the rest it can easily be obtained from books after graduation. To the average American Medical School these arguments, as well as others founded on the necessity of preliminary education to make such a course interesting or valuable, certainly apply, but the case is different I think with regard to this University.

It appears to me that to its students an account of the various systems of Medicine and Medical Philosophy which have from time to time prevailed, of the methods in which discoveries and progress have been made, of the



principal errors and fallacies which have hindered this progress, and of the lives and opinions of those who are recognized as leaders and authorities, cannot fail to be interesting and useful; that such a course would be a means of culture, a stimulus to thought, and would save much labor and research when the time comes for the student to attempt to teach, either from the Professor's chair, or through the press.

In Physics, Chemistry and to a certain extent in Natural History, the facts are either frequently repeated or can be reproduced by the experimenter at pleasure. In Medicine, as in political or social science, the case is otherwise; we must depend upon observation of conditions which may occur very rarely. Chance may present to the most obscure practitioner an opportunity for observation which the greatest master may never meet, and whether he will avail himself of it or not will depend very much upon whether as a student his attention has been called to the possibility of the occurrence of such a case. "*Qui nihil affert nihil refert*,"—it does not follow that one sees a thing because it is just before his face. I have before alluded to the fact that it is sometimes more desirable that the student should know where a certain piece of information is to be found than that he should attempt to remember the precise information itself, just as glancing over a table of contents will often save the necessity of reading a large part of a book.

In my experience in connection with a large medical library I have found that there are comparatively few Physicians who know how to get at the literature of a subject, and they may waste hours and days in search of what a few words of advice and a little bibliographical knowledge would enable them to lay their hands on at once. To a medical writer this knowledge is almost indispensable, for without it, as Malgaigne remarks, he will be doing the work of Penelope—recommencing each that of the day before.

I have had occasion to show that the old theories are continually appearing under new names, that for instance the hypotheses of Hoffman and Cullen as to spasm had been answered fifteen hundred years before in the criticisms on the doctrine of the methodic sects, and that, mesmerism and Braidism and Electro Biology are very old theories with new names only.

But in recommending that a course of lectures on the history and literature of Medicine be provided for in the curriculum of this University I do not wish to be understood as advising the usual methods. If I may judge from the printed lectures which I have examined, such courses are very apt to become merely medical Biography and Bibliography,—or else special pleadings in favor of some particular doctrine.



In this as in most other branches, the value of the teaching depends on the teacher, and even less than in others is it possible to lay down rules as to methods, or as to amount of teaching; the subject has no limits; and each man would make a different selection, unless indeed he be merely a copyist of the work of others.

Some knowledge of the lives and opinions of the great men of his Profession should be possessed by every Physician,—the Princes of Medicine have meditated and written upon many of the questions which still are unanswered, questions in no wise new or strange but older than the Sphinx.

Yet these questions come in slightly varied forms to each new generation, and the great majority are not sufficiently acquainted with what has been done in the way of answering them to keep from falling into errors which were pointed out hundreds of years ago. As I have elsewhere had occasion to say. (1.)

“Comparatively few persons have any idea of the amount of Medical literature in existence, or of its proper use and true value, and the result is that the same ground is traversed over and over again. Cases are reported as unique and inexplicable which, when compared with accounts of others buried in obscure periodicals or collections of observations, fall into their proper place and both receive and give explanation. Old theories and hypotheses, evolved from the depths of the inner consciousness of men too zealous or too indolent to undergo the labor of examining the works of their predecessors, re-appear and are re-exploded with the regular periodicity of organic life; and even when literary research is attempted, it is too often either for controversial purposes, to serve the ends of prejudiced criticism, or to support a charge of plagiarism, or else for the purpose of obtaining a goodly array of foot-notes, which shall imply that the subject is exhausted, and give a flavor of erudition to the work. This state of things is by no means peculiar to medicine, but its literature is certainly an excellent illustration of the maxim. ‘The thing which has been is that which shall be, and there is no new thing under the sun.’

“The record of the researches, experiences and speculations relating to medical science during the last four hundred years is contained in between two and three hundred thousand volumes and pamphlets; and while the immense majority of these have little or nothing of what we call ‘practical value,’ yet there is no one of them which would not be called for by some inquirer if he knew of its existence.”

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(1.) Rept. on Med. Libraries, 1876, p. 171.



I have now to say a word or two with regard to what are called specialties in Medicine, and as to what extent it will be desirable to provide special teachers, apparatus and means for giving instruction in them. On this point as upon several others in medicine there are decided differences of opinion in the Profession itself, but for the most part the controversies relate to the ethics of specialists with which we have nothing to do.

In any populous and civilized country the tendency is to sub-division of labor, to evolution by differentiation as modern Philosophers would say, and this is true in Medicine as in other arts, sciences and professions. It was so three thousand years ago in Egypt, two thousand years ago in Rome, and the tendency of modern Medicine in France, Germany, Great Britain and in this country is in the same direction. The reasons for this are stronger now than ever before, because it is no longer possible for any one man to grasp and retain a knowledge of all the branches of medical science.

From special study of one class of diseases, or of the diseases of a single organ comes increased skill in diagnosis, superior dexterity in manipulation, and fertility of invention of mechanical appliances for the investigation or treatment of disease.

On the other hand it is apt to produce narrowness of view, the assigning of an undue importance to local affections, and a strong tendency to magnify unduly the branch which the specialist professes. This is almost certain to be the case in certain specialties if they are the main object of study from the beginning, and not the outgrowth of general study and practice. Let us consider what these specialties are. They may be divided for our purpose into two classes.

The first are those which in the present day are usually the outgrowth from general practice, and may be stated as Surgery, Obstetrics, diseases of children, diseases of the Nervous System, Insanity, Forensic Medicine and Public Hygiene.

The second are those which relate to diseases of a single organ and are diseases of the eye, of the ear, of the skin, of the chest, of the throat and larynx, of the urinary organs, of the rectum, orthopaedic surgery and the diseases of women more especially those of the genitals. It will be perceived that these last are all outgrowths from Surgery, that they depend largely upon instrumental appliances, and that to succeed in them a taste for mechanical invention and manual dexterity are mainly necessary.

Clinical instruction is the main thing desired by those who wish to follow these specialties—they wish to be able to see and compare a large number



of cases of malformations or disease of the particular organ to which they are devoting themselves, and to practice the various manoeuvres and operations required until the special senses and the hands have become sufficiently dexterous.

From these considerations it is evident that it is not at present worth while to attempt to provide special facilities to attract this class of students. These specialties should be left to be the natural outgrowth of circumstances, and while in each enough instruction should be provided to meet the needs of a well educated general practitioner, it will not be worth while, at first, to attempt to make any of them prominent features either of the Medical School or of the Hospital.

It cannot be said that there is any urgent need for them at present, certainly there is much more need of some other things. With regard to specialties of the first class the case is somewhat different. For the diseases of children, Insanity and diseases of the Nervous System, Clinical facilities and material for study are still the most important requirements, and these I think it will be possible to provide in sufficient amount to warrant the making their study a prominent feature in the school. Under no circumstances however should the student be allowed to devote special attention to these studies until he has completed the general course, in other words they should be post graduate specialties, if they are to be specialties at all. I allude to them mainly for the purpose of indicating the direction in which I think effort should be first made to provide clinical material of a special class for study, and without going into particulars, I will only reiterate that circumstances are such that this can be done without much difficulty if suitable clinical teachers are obtained.

There are still left for consideration the special studies included under the term "State Medicine."

This term is not a familiar one in this country, owing to the almost total absence of the thing itself, and it is necessary to study the relations of the Medical Profession to the State in European countries in order to understand its full signification. In its widest sense it treats of preventive Medicine and of the relations of Physicians as individuals, and as a body, to the State, and includes Registration and Vital Statistics, Public Hygiene, Forensic Medicine and the legal relations of medical men to the public and to each other. Under the provision of the Constitution of the United States it is at present scarcely possible for the General Government to exercise directly any power in these matters for the reason that they belong for the most part to the subject of



Police, which is exclusively under the jurisdiction of the individual States. Almost the only channels through which the General Government can exert influence in State Medicine are the Census, legislation on Quarantine on the ground of its relations to commerce, (though this is hampered with many difficulties) and by collecting and diffusing information especially of a statistical character, through some of its bureaux.

When we turn to the individual States we find that many of them have taken almost no action on these subjects, and that in those cases in which legislation on medical or sanitary matters has been attempted it has been fragmentary in character and devised with little or no reference to the action of other States.

With reference to Public Hygiene this state of things cannot long continue, and as population increases, it is certain that we shall be guided by the experience of older civilizations, and shall recognize that even in a commercial point of view Public Health is public wealth, and that it actually "pays" to provide good air, water and food for the people, and to prevent individuals from contaminating the common stock.

It may require one or two wide spread and malignant epidemics to enforce attention to the matter, but it is to be hoped that this will be unnecessary, and that it will be perceived that the every day preventible diseases cause sufficient loss to warrant legislative interference.

In fact, there is little doubt that the people, and those who represent them in our Legislative assemblies, are even now satisfied that something should be done in this direction, but cannot agree as to what that something should be.

We have plenty of popular hygienists and would-be sanitary reformers, who wax exceeding eloquent in public meetings and through the press upon existing evils, but they either propose no remedy or what they do urge often resolves itself, upon close scrutiny, into the giving them an office or the purchasing of their patent ventilator, filter, sewage trap or what not.

Legislation upon Sanitary matters demands all the knowledge which can possibly be supplied, and more, for which reason it must itself provide for increase of knowledge.

A competent adviser upon the subject should know both Law and Medicine so far as their possible relations are concerned—for it will be almost as difficult to obtain what is desired by combining the opinions of a lawyer who knows no Medicine and of a Physician who knows no Law, as it was to produce the Magazine Article in Chinese Metaphysics by reading up in the Ency-



clopædia the Articles on China and on Metaphysics, and then combining the information; while the value of the result will probably not be much greater.

The Public are disposed to look to Physicians for advice and information upon these matters, but it should be noted that the course of education and routine of duties of the average Practitioner are little fitted either to call his special attention to such subjects, or to render him specially competent to investigate or decide upon the many difficult problems which they present.

It is true that he is somewhat better fitted than other professional men to enter upon their study, he is not supposed to look upon disease as a mysterious entity, the messenger of a special providence, or to rely on a day of fasting and prayer to ward off the Cholera, and he knows from practical experience that it requires something besides filth to produce most diseases, but his studies have been directed towards Therapeutics rather than prevention, and when he is consulted, the mischief has usually been done, and he has enough to think of in seeking means to remedy the results.

From the Medical side of the, questions relating to Public Hygiene must be considered the causes of disease, and the means which modern science, especially Physics and Chemistry, can furnish for avoiding, destroying or diminishing those causes, so far, at least, as they affect any considerable portion of the community. From the legal side must be considered the rights and privileges of the community as opposed to those of the individual in all cases, (and such cases form the majority,) in which the health of the many can only be preserved by curtailing the freedom of, or by causing actual pecuniary loss to the few.

As implied in what I have just said, the ordinary curriculum of Medical education is arranged with very little reference to the causation of disease, or at least as to remote causes, and when the Doctor is called in, unless the cause continues to act, rendering it necessary that it shall be removed before his treatment becomes of use, he usually pays little attention to it.

No doubt he often speculates as to what may have produced the trouble he is striving to remedy, but when it comes to a careful, minute, scientific investigation to determine this cause, he usually has neither sufficient motive, time nor knowledge to make it. Is it a matter connected with defective sewerage in relation to—suppose we say Diptheria? This involves questions of Sanitary Engineering, the work of the Plumber, the composition of sewer gases and tests for them, and a good practical knowledge of the use of the microscope in connection with the modes of development of the lower organisms, organisms so minute that the highest powers are required for their study. A



man may be a very good practitioner without any of this knowledge, and as a matter of fact very few Physicians have such knowledge.

Or let us suppose the question is as to whether a school house is properly planned as regards heating and ventilation, in order that the children may not be subjected to the evils of foul air and improper temperature. There is nothing in the ordinary education of a Medical Man which will enable him to give an opinion which can be relied upon in so important a matter as this, and he will do well if he can apply the proper tests to decide how well the rooms are ventilated after it has been constructed. But, while the Physician has not all the knowledge required for the solution of such questions as these, he has more than the Engineer or Architect, for as a rule in this country the average member of these professions has no knowledge upon such subjects at all. Not that there will be found among them any hesitation in giving opinions on such subjects, but such opinions are as a rule not worth the paper they are written on.

It needs but little reflection upon the subject of causation of disease, especially with reference to preventive medicine, to see that the most powerful means of increasing our knowledge of the subject would be an accurate registration of diseases as they occur in various localities, and a careful comparison of the results. Thus far we have no such statistics except those furnished by Medical Officers of the Army, and these relate only to the adult males of a floating and very unstable class of population. Mortality statistics will not serve the purpose, except to call attention to the aggravated cases of unhealthfulness, for there is no definite relation between the mortality and amount of sickness in a given place. Even Mortality Statistics are wanting for the large part of our country, and those which are furnished must be taken with many doubts and reservations owing to defective and improper returns. In speaking of the naming and classification of diseases, I have referred to the fact that the names of causes of death should be different from those used for clinical purposes. In the present mortality returns we have the clinical names, and the pathologo-anatomical names mixed indiscriminately, but this is but a small part of the difficulty. Suppose we wish to know the relative prevalence of malarial fevers in two given localities—the mortality statistics, if we had them, would give us but little information, indeed it might easily happen that five times as many cases of malarial affections should occur in the one place as in the other—and yet not a fatal case be reported. If we are to judge as to whether a given locality gives rise to consumption, or fever, or rheumatism, (and evidently this is the first step in a search for the cause,)



we must know how many cases of these diseases occur in that locality, and not merely how many deaths from them have taken place.

It is also evident that we can have no scientific test of the value of measures taken to prevent disease without this same information, for although we may be able to determine that a particular system of sewerage has diminished the mortality of a town, we can infer very little as to its effect on the sickness; in fact, a distinguished English Statistician, Dr. Rumsey, considers that there are grounds for the belief that "a diminution in the rate of mortality will be found to co-exist generally with an augmentation of the rate of sickness." (1.)

But as Dr. Dickson remarks, "it is the amount and duration of sickness rather than the mortality, that tell on the prosperity of a community, or as 'Dickens, or some one writing for him said: so far as the care of the body goes, it concerns a man more to know his risks of the fifty illnesses that may throw him on his back, than the possible date of the one death that must come, and of which the time is to him personally, in spite of Libraries full of Statistics, utterly unknown and uncertain.'" (2.)

How such Statistics can be obtained is a difficult problem which has never yet been fairly solved; its proper discussion requires the best legal as well as medical knowledge, for it involves the question of the relations of Physicians to the State and of the State to Medical Education, but solved it must be if Public Hygiene is ever to be put on a scientific basis and taken out of the region of cheap oratory and local politics.

I have alluded to it, not for the purpose of discussing it, for that would require a short course of lectures to itself, but to indicate one of the many ways in which the knowledge of the Lawyer should be combined with that of the Physician in matters relating to State Medicine.

If now we consider the subject of Quarantine against infectious and contagious diseases, using the word in its ordinary sense as meaning a system established by a City, State or Country, for the prevention of the entrance of persons or things which may be a cause of disease; I need only allude to the inevitable mingling of legal and medical questions in the devising and carrying out such a scheme of prevention, and to the fact that it is almost useless for a City to enforce a Quarantine by sea, if another City distant but a few hours travel by rail, and with which there is free communication, does

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(1.) Rumsey, R. W. Essays and papers on some Fallacies of Statistics. London, 1875, p. 58.

(2.) Idem, p. 89.



not take the same precautions. The details of what would be generally accepted as a good and satisfactory system of Quarantine are by no means agreed on, nor indeed is it certain that such a system is possible without doing more harm than good, for much skilled research as to precisely what it is that is to be guarded against, is still needed.

It is the same with regard to many other questions affecting the Public Health,—the steadily increasing pollution of our Water supplies, the Hygiene of Schools, the construction and management of Municipal Hospitals, the regulation of Prostitution, the prevention of the sale of improper or adulterated articles of food, of dangerous and unhealthful trades and occupations, all are subjects with regard to which much knowledge is needed, and subjects, of which very few men possess all the knowledge that is even now existing and available.

There is no Educational institution in the United States which fits its pupils to grapple with such questions, and for this reason, and also because I think that the time is soon coming when the services of some recognized experts in these matters will be required, I think that this University should endeavor to provide such.

Now what should be the Course of Study for a young man who proposes to enter this field of work?

In the first place he should have a thorough practical knowledge of Microscopy and of Analytical Chemistry. He should especially study the phenomena of the lower forms of life, bacteria and microzymes of all kinds.

He should become practically skillful and accurate in analyses of Air and Water, and should be able to determine adulterations of ordinary articles of food and drink.

2d. He should study the principles of construction of buildings, both private and public, so far as sanitary questions are involved. This will include Methods of heating, lighting and ventilation, House-Plumbing, so far as relates to sinks, traps, etc., and House drainage and Sewerage.

3d. He should study Engineering so far as it relates to drainage and sewerage, should be able to make a topographical sketch of a given district, and should have a sufficient knowledge of Geology to understand the position of Strata and their influence on Sanitation.

4th. He should study the Mathematics of Statistics, and especially the application of vital and sanitary Statistics and Medical Logic.

5th. He should study the subject of legislation with regard to the prevention of disease, and should be familiar not only with the laws of his own City



and State relating to such matters, but with the methods tried and the results obtained in other States and Countries in Sanitary Legislation.

6th. He should study the dangerous trades and occupations which, by the production of dust, of noxious gases and vapors, or of the contamination of water supply have a tendency to produce disease either among the workmen or among the residents of the neighborhood, in order to know in what the danger consists and how it may be best avoided.

Supposing that facilities for some such course of study as the one thus briefly and imperfectly sketched, were supplied in this University, I think there is little doubt that they would meet a real want.

Should the graduate of such a course receive a Special Certificate or Diploma setting forth his qualifications? I think this question should certainly be answered in the affirmative. Let us consider now another branch of State Medicine which is in the main included in what we call Medical Jurisprudence. Rather more attention has been paid in the schools to this subject than to Hygiene, for the reason that every Physician is liable at any time to be brought upon the witness stand, or to be called on to answer a demand for compensation for bad results of a case of dislocation or fracture. The great majority of Schools however dismiss the subject with half a dozen lectures, and nowhere are the facilities afforded for the special training of an Expert Medical Jurist. Such a course would include the special study of Toxicology, of Pathological Anatomy, of Insanity, of the principles of Life Insurance, of the law of Malpractice, of the duties of Coroners, Medical Experts, etc.

I suppose every one will admit that the public welfare requires that there shall always be available a few men prepared to state precisely the results of existing Medical knowledge as applied to such subjects. It is hardly possible that the average Practitioner of Medicine should have enough experience in such matters to give his opinions great weight, and when he is brought into Court in the character of a so-called expert witness, the result is generally very amusing and at the same time melancholy. The existing methods of obtaining and applying Medical evidence in trials of all kinds are very defective and unsatisfactory, since the so-called expert is placed in the position, not of an adviser of the Court, to give an impartial opinion upon the facts presented, but as an advocate retained for one party—to be cross-examined and discredited if possible by the other.

The result has been the production of a class of professional pseudo-experts whose "expertness" consists not so much in any special knowledge of their subject, as in the gift of fluent speech and in sufficient knowledge of



the tactics of cross-examining attorneys, to enable them to retain their self-possession and keep from contradicting themselves.

They consider their functions and duties as anything rather than judicial, and are pitted against each other as if they were to testify to facts instead of opinions.

There is of course no objection to retaining an expert in a case involving medical testimony, as for instance, when the plea of insanity is offered in a criminal case, any more than there is to retaining a lawyer, but it is as absurd to receive the statements of the one as evidence as it would be those of the other in the way it is now managed. The time will probably come in this country when the State will in some way have its own experts, possibly among its public health officials, just as it now has its Judges or prosecuting Attorneys, but were such a system to be attempted just now, I fear there would be great difficulty in finding a sufficient number of men with such qualifications as such a position requires.

Cannot this University provide the means of instruction suited to fit a few men for such positions, and give to those whose proficiency it has satisfactorily tested a Diploma which shall be their guarantee of fitness and ability? It seems to me that such a course is both possible and highly desirable, and I believe there will be no lack of employment for men thus qualified. The knowledge of Chemistry, Toxicology, Morbid Anatomy, Statistics and Law, which must be acquired in such a course, can of course be imparted here to those fitted and willing to receive it, but one of the subjects of study is more difficult to provide for, namely, the Jurisprudence of Insanity. The facilities required to make the student master of this exceedingly, and steadily increasingly important branch of Forensic Medicine, require very careful consideration, much more indeed than the brief time remaining at my disposal will permit me to give. These facilities must be clinical, for the only way to understand insanity is by studying the insane themselves. Leaving the matter of the Jurisprudence of Insanity out of the question, I have already indicated the subject of mental disease and diseases of the nervous system as one of the specialties which I recommend should be provided for here, because there is actual need of such provision.

There is scarcely any subject with regard to which there is more uncertainty among the public at large than with regard to the proper mode of dealing with the Insane. As Dr. Laycock says: (1.)

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(1.) *Mind and Brain*, Lond., 1860, Vol. 1, p. viii.



"The public mind in general, ignorant of its (insanity,) nature and causes, vacillates to and fro with a lamentable mutability of purpose;—being now full of sympathy for the insane, and indignant at their detention in safe custody; now horror-struck by some terrible act of insane violence, and indignant that the wretched sufferer should escape the vengeance of the law."

And not only is this true with regard to the general public, but it applies also to a considerable extent to members of the learned Professions. Not many Clergymen, Lawyers or Physicians can be found who have really considered the questions, of the proper relations of the State and of Society to the insane, of the responsibility for their actions which shall be considered proper, and of the limits which shall be placed in defining the legal meaning of that very indefinite word, "Insanity."

That the State must assume the care of the individual who is by reason of disease unable to take care of himself, is now generally admitted, but whether the State has any rights or duties in relation to protecting itself or its citizens, from such individuals, is a question which has been very little discussed. The danger to the State from an insane man is not only from the crimes which he may commit in his paroxysms of Mania, but also, and to a much greater extent, from the peculiarities which he will transmit to his offspring. So far as society is concerned, it is much better that a man who is insane in the ordinary sense of the word, should be from the beginning hopelessly and incurably so.

The study and treatment of Insanity require special knowledge and training in addition to, and by no means in the place of, a first class medical education.

In this country, how and where is this special training to be obtained? Of course it can only be in the Asylums themselves, and what facilities do they afford? The answer is, none or next to none. If the young Physician who desires to study this subject is able to obtain a position as resident in an Asylum—he will be able to see cases, it is true, but will receive little direction or aid in their study. The great majority of Superintendents have not had the scientific training, nor do they have the necessary inducements to enable them to study their cases as they should be studied. They are rather Hotel keepers than Physicians, they are good authorities on Heating and Repairs, the price of beef, the details of Housekeeping, and the profits of farms and gardens, but where are the contributions to our knowledge of this disease and of the best methods of its treatment, which our Asylums ought to have furnished? with two or three honorable exceptions they do not exist.



The statistics of these Hospitals are often improperly kept, many cases of cure being reported which are by no means such. Thus at one institution, according to Dr. Earle, 1,841 persons actually treated, were reported as 2,308 cases, the number admitted twice being 280, thrice 81, 4 times 33, &c., and one patient admitted twenty-two times and discharged cured every time.

There is now in course of construction near this city an Asylum arranged upon a special plan, which it is hoped will tend to materially increase the percentage of cures mentioned above, and besides this, there are in the immediate vicinity of Baltimore other Asylums, so that an ample amount of clinical material is at hand. I trust and believe that it will be possible for this University to make such arrangements as will not only enable it to use these establishments for instruction and increase of knowledge, but as will be of marked advantage to the Asylums themselves.

Another branch of study alluded to as one with which the Medical Jurist should be familiar is Life Insurance. Within the present century this has become a great commercial interest, involving at the present day probably a thousand millions of dollars, and to manage such important interests there is need of men specially trained for the purpose. In my opinion a medical education should form part of this training, but the ordinary medical education is by no means sufficient to qualify a man to be even a medical examiner only, much less to discuss the questions of influence of Race-heredity, locality, Anthropometry, Life probabilities, etc., which Life insurance involves, nor to make use of the fine opportunities which a large Life Insurance Company presents of adding most materially to our knowledge upon these points.

One more special indication which this school should attempt to meet may be mentioned, and that is to provide means of instruction for Medical Officers of the Army and Navy.

The duties of such Officers are very multifarious, and as they are often in positions where they cannot consult with others, it is desirable that they should be prepared to meet all emergencies. In almost all civilized countries, except the United States—there are special schools under charge of the Government for educating such Officers, and it has been proposed to establish such schools in this country. There are however some very serious difficulties in the way of doing this. An Army Medical School for instance should be in or near Washington in order to have the advantage of the fine Library and Museum under the charge of the Medical Department there, and of the studies of the Medical Officers connected with those institutions, yet it would not be possible to provide there the means of clinical instruction



required, and it would probably be impossible to obtain authority and means for establishing such a school, without running great risks of being hampered by appointments which would not be satisfactory.

It appears to me that all the peculiar advantages of such a school can be furnished here. Washington is but an hour's ride away, and thus there is no difficulty in making use of the collections there, while the disadvantages and burdens which might be imposed on the Departments, if they undertook to carry on a school themselves, would thus be avoided. The Army and Navy Medical Officers require some special means of instruction, not only before they enter into the service, but at intervals afterward. After they have served five or six years on the frontier or in distant stations, they must undergo a second examination before a Government Board.

Prior to coming up for this examination, it is very desirable that they should have the opportunity of reviewing their knowledge and of becoming acquainted with the latest advances in Physiology, Pathology, Diagnosis and Therapeutics. They can always obtain a leave of absence for this purpose and would certainly come to this place if their peculiar needs were provided for, since it would give them most convenient access to Washington.

The possessor of the degree of Doctor of Medicine of this University, if it is such a degree as I have indicated, would be sure of being able to obtain a position in the Medical Staff of the Army or Navy of the United States, if he desired it, and it would be a wise proceeding on the part of the Government to make the position such that the holders of such Diplomas would desire it, and that only such could obtain it.

Having thus indicated in outline the plan of organization of the Medical Department of this University which seems to me desirable, the next question is,—how much will it cost?

Without going into details, I would reply to this that the annual cost of such a Medical Faculty as I have proposed would be about \$60,000.00. This includes Salaries, Laboratory expenses, care of buildings, etc., but it does not include the cost of instruction preliminary to the Baccalaureate of Science nor that of Clinical Instruction.

In conclusion, I may remark, that if this plan be approved and followed, it is probable that none of us will live long enough to see the perfect fruits of it. Yet it does not seem to me to be a mere vague dream that those fruits, in the shape of additions to human knowledge and human happiness, in the shape of men of whom this country may well be proud, and in the shape of



honor and fame for the institution which has produced such results,—will surely come, come for our children's children, though not for us.

And our duty under the circumstances is clearly and briefly indicated in that best of all books, to be consulted where a question of duty is concerned.

"Behold the husbandman waiteth for the precious fruit of the earth, and hath long patience for it, until he receive the early and the latter rain. Be ye also patient."