puts before the public were it ten times more powerful and generally useful than any medicine yet known. The most nearly decent proprietor of such a preparation is spending a large part of his time and thought in exaggerating the virtues of his drug and minimizing its evil effects. His aim is to build up an impression, manufactured out of hope and based on credulity, which will cause people to buy his wares.

HOW THE PHYSICIAN IS MADE A CATSPA.W.

In accomplishing this aim he seeks the assistance of the medical profession, he studies the psychology of the medical man and employs such agencies as will best accomplish the object. He sows free samples broadcast, calculating that one prescription from one physician will pay all the expenses of sampling ten. He pays impecunious or renegade members of the profession for what purport to be scientific articles, making favorable mention of his drug. But especially he buys the advertising pages of the medical journals, with the good-will of the editorial management thrown in, to keep his blatant unsupported claims and skilfully worded suggestions forever before the eyes of our profession.

Thus are a multiplicity of worthless preparations, of false statements, and of distortions of facts brought to hinder the progress of scientific medicine even in the mind of the physician, and weaken his power to combat disease. Thus do our enemies damage the healing art and steal the confidence the community reposes in the physician and use it as an important aid in the creation of the false impression, through which they hope to amass fortunes—the very livery of heaven to serve the devil.

The time has come when the treason in our own ranks, which makes it possible and easy to use the reputation of medical men and medical journals against our profession and the interests of our patients, should be recognized and characterized in its true light. The proprietary medicine manufacturers fight the medical profession in every state in the Union, with lobbyists in the hall of every legislature, and with clauses like these inserted in their contracts with the newspapers:

1. It is agreed in case any law or laws are enacted, either state or national, harmful to the interests of the ——— Manufacturing Company, that this contract may be canceled by them from date of such enactment, and the insertions paid for *pro rata* with the contract price.

2. It is agreed that the ——— Manufacturing Company may cancel this contract *pro rata* in case advertisements are published in this paper in which their products are offered, with a view to substitution or other harmful motive; also, in case any matter otherwise detrimental to the ——— Manufacturing Company's interests is permitted to appear in the reading columns or elsewhere in this paper.

On the other hand, these same manufacturers subsidize some of the largest so-called "independent" medical journals of the country to induce the more poorly trained, ignorant, lazy or careless portion of the medical profession to prescribe these nostrums; while the more venal lend their names and talents to give such use of these nostrums an air of respectability.

Charity may well be exercised toward the shortcomings of individual physicians; but there is no excuse for medical organizations in any way favoring or condoning the efforts made to confuse medical fact with falsehood and bring about the disintegration of an organized profession. Of course, the effort is persistently made to beg the issue. There has been a great deal of hypocritical rejoicing in certain medical journals over the declaration of the American Medical Association at the

Boston meeting that it was not opposed to "independent medical journals." No one ever honestly supposed that it was. The declaration simply met the false issue raised by those who give "aid and comfort" to the enemies of the profession, when there was evidence of a disposition to oppose the treason which manages so-called "independent medical journals" in the interests of nostrum makers.

There is need on all occasions and on all sides for clear thinking and plain speaking in regard to this matter. Let it be understood that it is treason to the traditions and ideals of our profession, treason to scientific medicine and to medical organization, to give aid and comfort to our enemies by prescribing, recommending, associating one's name with, or advertising any proprietary remedy, which is secret in composition or method of manufacture, or for which extravagant, misleading or untruthful claims are made.

THE PLACE OF PATHOLOGY IN THE UNIVERSITY.*

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It is a well-known historical fact that the origin of the natural sciences and in particular that of the biologic sciences is closely connected with the study of medicine. Physics, chemistry, zoology and botany were not only first cultivated mainly by physicians and students of medicine, but their special problems were also in the beginning largely the outgrowths of questions that plagued the minds of those who practiced the art of healing. As time went on these sciences did not remain exclusively attached to medicine and the medical schools, but became associated with other branches of learning. The history of education shows that universities, throughout their development, have been almost continuously enriched with new subjects for study and scientific investigation derived from the activity of medical thought and practice. Singularly enough, the universities, and more strangely still, the first born of the natural sciences, have not always shown themselves hospitable to the biologic studies that have been developed more recently in medical surroundings. Zoology and botany hold conspicuous and time honored places as branches of study worthy of the attention of the general university student, while an unmistakable, although it must be confessed feeble protest is being made even to-day in some quarters against the admission of scientific anatomy and even physiology into the same category. In one instance, the classification of the biologic sciences into medical and non-medical has had the effect that the buildings that house comparative anatomy, zoology, botany, and chemistry are separated by a considerable distance and by other barriers from the new and magnificent facilities for studying human anatomy, physiology and pathology. Apart from the essential identity of many of the biologic problems, and putting on one side the question of the lessening of the opportunities for mutual intercourse among workers in related fields, there is here involved the question of the exclusion of the general university student from participation in some of the most stimulating and momentous scientific movements of the day.

Medicine on its side also is the loser by any divorcement from the university. On more than one occasion in the last few years zoölogic and chemical discoveries

* President's Address, Chicago Pathological Society, Oct. 8, 1906

and theories have influenced fundamentally the trend of medical research. Who will undertake to say that the origin and growth of cancerous tissue is not essentially an embryologic or cytologic problem, and may not eventually be explained by the zoölogist rather than by the professional pathologist? Any separation of the biologic sciences into medical and non-medical groups is not only artificial, but is open to the danger that either group may develop asymmetrically, imperfectly or abnormally when the restraining or stimulating influence of the neighboring science is withdrawn.

Pathology is one of the biologic sciences that has most recently swum into the ken of many professional educators, and the question will soon arise, if it has not already arisen, as to what justification exists for the introduction of such a subject into a university. At present the universities in the United States that foster a department of pathology or one of bacteriology and hygiene on the same academic footing with a department of Latin or of Sanskrit may almost be counted on the fingers of one hand. Out of forty of the leading colleges and universities only eight, according to statements in recent catalogs, give to their academic students an opportunity for studying bacteriology or pathology.

It may be said in the first place that any one acquainted with the subject matter of pathology understands that since it deals largely with physiologic, anatomic, and chemical data its pursuit must suppose sufficient and correlated facilities for the acquisition of the more fundamental branches. It would be a mistake to assume, however, that pathology is merely a form of the technical application of these sciences. Investigation into the nature and causes of disease carries with it as definite and as independent a body of problems as does the meaning of structure or the interpretation of normal function.

The advanced character of much of the work in pathology as determined by the extent of preliminary training necessary for effective approach, and the special facilities essential for many kinds of pathologic work are likely for some time to come to limit the introduction of pathology into universities and at least to keep it in the category of elective rather than required subjects. This is not the time or the assembly for a full discussion of the respective provinces of required or elective studies, but it is natural that the courses in pathology in their broader aspects should be elective for the non-professional student, although it may well be questioned whether some of the fundamental principles of bacteriology and hygiene are not deserving of consideration side by side with other courses in natural science of no greater educational value and of decidedly less practical significance for the average human life.

Taine says that the first great English utilitarian, Francis Bacon, at the age of 16, expressed dissatisfaction with Aristotle's philosophy, not that he thought meanly of the author, whom, on the contrary, he calls a great genius, but because Aristotle's system seemed to him of no practical utility, incapable of producing works which might promote the well-being of men. However steadfastly it is held that the true university should stand as a bulwark against the ever aggressive forces of materialism and crude self-interest, it is also possible to maintain that the large purpose of promoting the well-being of man is a vital part of its functions. Whatever may be said about the idealistic value of pathology there can be no question as to its importance in its broader utilitarian or humanitarian aspects. As a

subject of scientific research pathology does not need to defend its place in the university. It both strives to extend the boundaries of knowledge and aims to promote individual and general happiness and welfare.

One of the points on which issue is joined is more subtle, or, if you please, more academic than this. Should professional studies which are necessary for the special students of law, divinity, medicine, or engineering, be allowed to count toward a college degree? Are they, in other words, to rank on the same footing as courses adapted for training students to proficiency in Latin, mathematics, or biology? The question of educational values and the relative merits of different branches of knowledge lies in the main outside the scope of this paper. I can not, however, help expressing my disagreement with the advocate of specialism who holds that special aptitude and concentration are the main things to be considered, and that every student should be allowed to work out his own salvation with his own talent in his own way. My observation indicates that few if any students are able to pick their way to advantage through the maze of studies in a modern university. Trivial, even mischievous reasons are allowed to sway the choice of courses and the result is in too many instances a jumble of brilliant misinformation. The principle of election of studies, in itself sound and worthy of extension, has been misapplied and misinterpreted until some have come to believe that the subject studied is of little moment, provided that a student feels or fancies that he feels a desire for it. From this view I cordially dissent. If the history and experience of the human race count for anything Choctaw is not so educationally valuable as Latin, or bookkeeping as plane geometry. A limit should be placed somewhere to the possibilities of election on the part of the college student. Subjects that may well find a place in a university devoted to the advancement of knowledge need not forthwith be made accessible to the whimsical choice of undergraduates. One of the notorious and still growing evils of the situation is the multiplication of what I may call intermediate courses which stand between the fundamental courses and the seminars or conferences intended for the guidance or promotion of research. Many of these courses are simply a concession to the feeling for symmetry and completeness, and their existence among college electives is educationally deplorable. Mr. Charles Francis Adams contends that a college education should be "purely a training of the mental powers—the suppling and development of the intellectual muscles—the proportioning of the faculties." He follows this with a definition of the educated man which in its blending of the older traditions with a very modern spirit is worth quoting. "An educated man is, I take it, one in whom the imaginative faculties, the reasoning faculties, and the observing faculties have all been properly and adequately developed—developed to such a degree that each becomes a usable tool for accomplishing the work in hand to do."

I believe that it should be the work of the colleges to turn out men so trained and equipped, and that to effect this end a much more scientific application of the principle of the election of studies is needed than has yet been made. This carries with it, too, a task which college authorities almost invariably shirk, a study of the individual student, of his needs and deficiencies as well as of his aptitudes and passing inclinations. A smaller number of courses announced and given, an adoption of

the principle of election within groups of studies and more attention to the individual as an individual are, it seems to me, some of the immediate objects to be aimed at in American college and university life.

How, now, in view of these considerations, should we attempt to adjust the demands of professional education to the best interests of the undergraduate student? The question really resolves itself into determining what courses of a professional nature best serve the purposes of a true education, bearing in mind that the end in view is not the amassing of information, but the symmetrical training of the faculties. Only those professional courses that distinctly serve this end should be thrown open for undergraduate selection. From purely technical and informational courses they should be debarred until they enter definitely on their professional career. It may even be questioned whether in strictly professional work the informational course does not play a far larger part than it should. Mr. Adams, in the address above quoted, says: "The reasoning man, devoid of imagination and unable to observe, becomes, whether in religion, in politics, or in philosophy, notoriously a pitfall. On the other hand, the observing man finds himself at fault unless he can imagine and reason. No man, moreover, is fit to be called educated unless in him each group of faculties has been supplied and trained." Every student of science, and especially every student and teacher of medicine may well consider whether, if he accept this view, many courses now recommended to or required of the prospective practitioner, investigator, or teacher could not readily and advantageously be dispensed with.

In a university, therefore, the courses in pathology ought to stand on their own educational merits and be weighed like courses in Hebrew or on the political constitution of the Romans, not so much for their informational content as for their ability to train the powers of the mind. Like other courses in natural sciences the fundamental or elementary courses in pathology and bacteriology possess, in my opinion, a peculiar and unique value not possessed by courses in linguistics, history, or economics. Much is said nowadays concerning the introduction of the scientific method into these subjects; it might even be semi-seriously urged that science is not needed by the student of philology and economics since these branches have become infected with the scientific method. One of my colleagues has recently said: "There is certainly no fundamental distinction between the researches of the historian, the philologist, the social statistician, and those of the biologist, the geologist, or even the physicist and chemist in point of method." With this view I can't agree.

It must not be forgotten that while certain features of the scientific method are applicable to subjects like history and philology, others are not and in the nature of the case never can be. The student of history can rarely if ever depend on his own first-hand observation, but must rely more largely than the student of science on facts recorded by observers of doubtful capacity or even questionable veracity. The original documents, moreover, that constitute the raw material of history, are often so tinged with human passion as to be valueless as records of observed fact. Furthermore, the opportunities for experiment, of which science makes so large a use, are practically altogether wanting. When complex economic phenomena are accurately observed and their nature correctly interpreted, it may be possible to frame plausible generalizations, but the verifica-

tion of these generalizations is another matter. There are different views as to whether the governmental ownership of railways in the United States is practicable or desirable, but none of these theories can be verified in a class-room, nor can we make on a large scale a series of experiments, first in one direction, then in another, while all other conditions remain the same.

I am compelled to believe, therefore, that the scientific method in its entirety and cogency is best exemplified by courses in natural science. The advantages, such as they are, of personal observation and experiment followed by generalization and verification, may be presented by the fundamental courses in pathology and bacteriology, as well as by courses in other natural sciences. In fact, something might be said in advocacy of bacteriologic method as calculated to enforce in a peculiarly direct way the necessity of uniformity of condition in experimental work, but this is not essential to the present argument. Granting that the elementary courses in pathology, therefore, stand on the same level, educationally speaking, as the other branches of natural science, it must be added that in common with the rest of the biologic sciences they demand some preliminary scientific training for their successful approach.

Although I am heartily of the opinion that training of the imagination, the reason, and the power of observation should be the main object of a college course, there is no reason why a steady prosecution of this object should prevent one from gathering flowers by the wayside. It seems possible to attain the end and at the same time to acquire information of a kind most likely to be useful to the average human being. Here lies the opportunity for the group elective system which shall give some play to aptitude and inclination at the same time that every course is made to tell in the direction of mental efficiency and control. The evaluation of the subject matter of a science is perhaps more a question of personal temperament than any yet touched on, and I do not wish here to advance the claim that to any discerning intellect pathology stands supreme among the sciences. I would simply point out first that the known and elementary facts regarding the nature and causes of disease are of importance and usually of interest to the individual, and second, that the diffusion of at least an elementary knowledge of these facts is essential to the well-being of every nation and community.

THE ADJUVANT ACTION OF QUININ HYDROCHLORATE IN INFECTIONS BY THE BACILLUS OF TETANUS.

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Not long since my attention was directed to a case of tetanus of a very rapid and severe type which ended fatally. It appeared to be a case of so-called idiopathic tetanus as no history of trauma of any kind was given. On careful examination it was found that the patient had been threatened with an attack of malaria not long before the attack of tetanus and had been given a hypodermic injection of the hydrochlorate of quinin by the physician in charge. The attack was evidently aborted as no other symptoms resulted until those of tetanus developed. This incident called to mind some very interesting work reported by Prof. M. E. Vincent, which I had tried to corroborate some time before. In