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THE INTEREST OF THE PUBLIC IN MEDICAL EDUCATION.

BY CHARLES F. PAINTER, M.D., BOSTON.

THERE is nothing which touches the nation, the community, or the individual more closely than matters pertaining to health; of the machinery by which the Federal and State Governments defend their citizens from the dangers incidental to disobedience of immigration laws and rules regulating importation of food stuffs, drugs, and many other things, the average citizen knows but little. If he thinks about them at all, it is with a comfortable assurance that the dangers are trifling and the chances of their touching him, or his interests, are not great. He regards such things chiefly as they may affect life or health, rarely in their economic and social relations as well. In the community, the abolishment of nuisances which threaten public health and the prevention and restraint of local epidemics are a real menace which we all take a little more to heart, and know a little more about the machinery for working out the solution of, than we do about Federal Health protection. When it comes down to the individual, his personal well being is a very vital matter to him, not alone for his own bodily vigor, but for the good of his dependants. It is a basic question, and upon it hinges more than upon any other one thing, his every activity and his entire happiness. He

is surrounded with agencies of all sorts with which to fend off dangers and fortify himself against insidious attacks. Perhaps more people are actually obsessed about their health, to a greater or lesser degree, than about any other one thing in life, unless it be about amassing a fortune.

As a fundamental principle of every real defensive health measure, whether it concern the individual, the town or city, or the nation itself, lies the knowledge acquired and the skill developed by the experience and research of the medical profession. Anything, therefore, which lessens the value of the training accorded our youth, who answer the call to enter that profession, is of direct and personal interest to every citizen, no matter how humble his station in life. It is as much a matter of his concern as any problem affecting his civic activities. If one concedes the existence of such an interest in public health matters, then it follows that the public should be encouraged to think in terms of medical education. One of the serious faults of our educational system today is the fact that the conduct of it has been left too much to pedagogical experts who are so engrossed with theory and experimentation that they have little time to devote to the ascertainment of what the real needs of the public are. In the medical line, though we have been freer from interference by pedagogues, we have been gradually drifting into errors similar to those fostered by them in the general educational field.

Evidence has been accumulating for a long time that something is wrong with medical edu-

cation. About fifteen years ago, when it became apparent that there were a surprisingly large number of "Diploma Mills" scattered over the country, interest was aroused in various quarters which took shape in three organizations devoted to the betterment of the practice of medicine and surgery throughout the country. As a result of their activities, the number of medical schools was largely reduced and the enrolled matriculants in them correspondingly diminished. A great service was thus rendered to the public by wiping out the cheap grade school which was, in many instances, only a commercial proposition. The sequel of that has been the creation of a situation in the medical schools of today which has laid the ground work for the thesis that I wish to establish, and that is, that medical education is falling short of its high purpose and failing to fulfill its responsibility to the public, because it is tending to teach medicine as a science, and not as an art. The study of science will always be intimately associated with preparation for medical practice, but the human body is not a retort, and until it is, it will be impossible to plan the treatment of diseases to which it falls a victim and which have this body as their habitat, as if it were.

A second shortcoming of present-day education in medicine is its tendency to the overdevelopment of specialists. We are accustomed to exclaim about the wonderful progress which has taken place in recent years in medical knowledge, and well we may! We hear the assertion made over and over again, that no one, now, is able to grasp the sum of present-day scientific knowledge in medicine and that it is therefore axiomatic that the field which any one man may till is necessarily a narrow one. The motives prompting the early pioneers in the realm of specialization were unquestionably proper ones and the value of the application of individual research in many restricted lines in respect to the volume of information made available for the good of the public, has been past computation. The situation is not unreasonably comparable to the rush to the gold fields of California and Alaska, to which so many adventurous spirits crowded in search of a fortune easily to be obtained, or, at least, to be shortly acquired. The temptation to crowd into the realm of specialization was compelling. Interest in a search for something new and valuable was alluring. It is almost unbelievable that in so short a span of years the specialist in practice should have so appreciably crowded out the old-fashioned general practitioner—practically wholly in the large cities and towns—and curtailed the numbers of the really efficient ones in the smaller villages and rural communities. Great as have been the advantages in the information acquired and made available for medical students, this has not been

accomplished without many disadvantages to the public at large, which are now beginning to offset the benefits. The time has come when the pendulum should swing back to a degree, with a consequence that less specialists shall be *turned out* and more men *trained* for general practice.

A third failing of our modern medical schools is to be found in the tendency which their methods have to encourage their graduates to feel that without the equipment of modern clinical laboratories, close at hand, it is impossible to satisfactorily engage in the practice of their profession. This implants in them a disinclination to depart far from centers where such facilities are readily procured.

I submit that we may reasonably claim that that system of professional education is failing in the attainment of its goal, which substitutes a false objective for the true one; which inclines to overload the field in which it operates with highly trained specialists, thereby increasing the cost of service to the public, and develops a class of practitioners who, through no fault of their own, are dependent upon a costly equipment, unattainable for the major part of the population to whom trained medical service is quite as essential as it is among the more favored, because wealthier, centers.

Before going on to discuss at greater length the above mentioned failings in our present educational endeavor along medical lines, it may be proper to call attention to two other minor shortcomings in the system. The first is that the time element entering into the present day curriculum debars from enrolling in the profession a considerable number of men who are of the sort from whom the best practitioners are developed. They can afford neither the money nor the time. The claim that scholarships are available for many such only partly meets the objection, for these can affect the time spent in no way, and do not carry over into that period of the first years of practice, which loom so large to a young man with a profession and all the ambitions he has for himself at 27 or 28. No one who has had any intimate acquaintance with the administrative affairs of a medical school can escape the conviction that a very considerable number of matriculants ought never to have been permitted to study medicine and this not at all on the ground of failure in scholastic attainments. Many come because their families have always had a physician to represent them and they feel that the line should be perpetuated. Others are recruited from families who have risen in the social scale through commercial success, and aspire to send some member of the clan into a profession. A few elect medicine because some college friend has done so or because in a university science course they had a morbid interest in the dissection of the earth worm or cray fish. Some apparently select

medicine for no reason at all; there is money enough at home, and after wasting four years in an academic course where they could rub along and have a good time into the bargain, they fondly hope that such a career can be stretched out for another four-year period. The representatives of these various groups, and they are more numerous than one would suppose, are drawn from that class in society for whom the question of time or money does not figure in the reckoning. The really solid, substantial, dependable practitioners will be found in proportionately much larger numbers in the middle-class ranks, were they not barred out by the cost element. Two years are now wasted in preparation to enter upon practice, and this represents a loss of two of the most fruitful years in a young man's life. He has passed the peak of his intellectual acquisitiveness before he can earn a dollar toward his support, and this is disquieting to any red-blooded adult when he stops to think of it.

The second failure, fostered by the ultra-scientific development of modern medical education, is the subordination of the methods of physical examination belonging to the olden days, to the up-to-the minute laboratory technique for the investigation of the same phenomena. Of course, auscultation and percussion are still taught, but where there is a short cut it is natural that it should be taken by the student. The employment of these methods can have no other effect than that of making him *lean* upon the supposed instrument of precision. The consequence is inevitable, one's powers of observations are not only *not developed*, they are even impaired, and in reliance upon specific tests there is less scope for the exercise of one's capacity for logical deduction and other processes of reasoning. The professional man is reduced nearly to the level of the mechanic in the shop, whose situation we pity because he has, all day long, to do one or two simple things, or stand by and watch a machine monotonously perform them. He has not the pride in the result of his handiwork that belonged, for example, to the old-fashioned shoemaker who performed all the various processes himself, and the shoe that resulted from his efforts was a better product than the machine-made affair. To have all one's investigations made by laboratory assistants or to sit at one's desk and receive reports from a half dozen specialists through whose hands the patient has passed before coming for review, makes one lazy, intellectually, and robs practice of half its zest. Still another defect in the modern curriculum, a defect common to all classes of educational endeavor, is the multiplicity of subjects touched upon—I will not say taught. This, in the general field of education, is due to the emphasis laid upon vocational training as at present stressed in the public schools. In medical schools, it is due to

the same tendency, *viz.*, to provide in the curriculum for a smattering of all the specialties. Pedagogically, I suppose it is believed that variety in respect to the day's intellectual pabulum speaks for greater accomplishment, but this is a fallacy from every point of view. The mind is not trained thereby; neither is the store of knowledge permanently increased.

Those chancing to read this, who are old enough and fortunate enough to have been reared under the régime of the "family doctor," do not need any arguments to prove to them that medicine is an art and not a science. To the discerning among the laity and the intellectually honest among the profession, there must be a tacit agreement to the effect that the major part of the good one receives and the other gives, is not dependent upon the prescriptions written on the nauseous mixtures or sugar-coated pills ingested, but upon the psychic effect produced by the personality of one possessed of a superior knowledge of matters physiological and pathological over another with no such store of knowledge but supreme confidence in the physician's skill. If this is backed, as it usually is in the case of the family doctor, by an intimate knowledge of the patient and his forebears, there is no question but that what bears most effectively upon the conduct of that case is not science, but art. How much of this element, so essential to successful practice, can be derived by a medical student from the full time clinical professor who is paid a good salary in order that he can give his entire time to hospital practice and teaching, it does not take a vivid imagination to visualize.

It is unavoidable that many of the factors which contribute to the success of a practitioner among people in their homes should be lacking entirely in the equipment of the full-time, clinical professor. He, indeed, is a rare man who can keep the human touch, without which the practice of medicine is an unfeeling trade, when devoting all his time to hospital routine and research. There is a decided tendency in medical schools controlling their own hospitals to oust the clinical or bedside teacher from the saddle and put the laboratory trained man in his place. Where the move in this direction is instituted by the medical school, and it practically always will be, there can be but one outcome. The hospital must serve, primarily, the purpose of the medical school, and in the modern school research is the keynote which must be sounded in order to secure the type of teacher that such a school demands. It is, of course, good business to affiliate as closely as may be the clinical, *i.e.*, the bedside, opportunities of a hospital with the medical teaching in schools. It is economical of everything. It is, or should be, mutually beneficial to patient, institution and teaching force, but restrictions should be imposed whereby the

patient's standpoint is not lost sight of by anyone. He, or she, goes to the hospital to be treated, and not merely studied. Diagnosis is important, but the common run of cases are not rarities, and the trying out of physiological tests of doubtful significance under any circumstances, though perhaps justifiable to employ where a diagnosis is in doubt, are not worth while where their confirmation is not essential for the determination of the nature of the trouble or its proper treatment.

The clinical assistant who abstracts blood from your veins, or fluid from about your spinal cord, may impress you with the profundity of his humanitarian instincts, but he is not apt to do so, and what you long for is some one who will sit down beside you and make you *feel* that you are something besides a cytological entity whose metabolism has in some unaccountable way gone wrong. If every one in connection with a hospital feels that way about the patients, and no one has the time to do anything but attend to the procurement and analysis of the various data that modern research has indicated may be desirable in a given set of phenomena, how is the student who is there to be trained, to learn that there is anything to medicine but its science? The Council on Medical Education of the American Medical Association rates very highly, in its estimation of the ranking of medical schools, the facilities for research which the endowment of the school provides. The cost of furnishing full-time clinical teachers, equipping all departments with research facilities, paying the salaries of research scholars and other expenses incidental to such a program, mounts into large figures, besides taking the time of both student and teacher that might be more profitably spent in other ways. It is no part of the province of a medical school to inculcate the spirit of research in the medical student, and the number of men upon any faculty who must be imbued with this spirit need be very small indeed. One New England school, committed to this principle, reports that it cost \$3000 per year, per student, to fit them for graduation. Not one man in a hundred has it in him to become a research man, so that it is a pertinent question, why spend such sums to fit men for general practice unless it can be very conclusively shown that training obtained under such a régime is so far superior to the old method that there is no comparison in the results. Research men are, of course, needed in medicine, but the Rockefeller and other Foundations provide all the facilities for their training that the schools of the country need at the present time.

The condition created by the unwarranted tendency to specialization needs a little further elaboration. That the benefit to medicine which has resulted from the special study and investigation given to various fields whose symp-

tomatic inter-relations were not well understood, has been incalculable and has been indicated before in this paper. The harm which is resulting from permitting unqualified men to set themselves up as specialists, is a side of the picture only just now coming conspicuously to the front and in ways that are sometimes not easily appreciated. The remedy for the situation lies largely in the medical schools. The personnel of the medical profession is as frankly human as that of any other group of professional men or laymen. That they have no qualification for specializing in any subject does not particularly disturb them. They see an opportunity to escape the drudgery and responsibilities of general practice and secure the pecuniary emoluments accorded to the specially qualified. They attend a few special clinics, or perchance take one of the many six weeks' intensive course offered by post-graduate schools and they then shamelessly let it be known that they are to do only a restricted type of work thereafter. They are henceforth full-fledged specialists and are entitled to "all the rights and emoluments thereto pertaining."

They know so little medicine outside their own restricted line, granting they may be qualified in it, that they can go but a short way without calling for help, and thus the services of another, and yet another specialist is invoked. I know that this is not a criticism that can be made of the best trained and most conscientious, but as I have already intimated, there are a good many who are not well trained, *because* they are not conscientious. Those who can afford to get their advice piecemeal, will, of course, do so, just as they indulge themselves in any other extravagance, with a shrug of the shoulders and an it-comes-high-but-we-must-have-it attitude. Those who would rather try to remedy this defect in the organization of the medical profession than attempt to secure what they are after at the prevailing rates and with the accompanying inconvenience, have been casting about for a solution of their problem. The most plausible answer is offered by state medicine, and herein lies one of the gravest dangers that the members of the medical profession, as individuals and as a class, have confronting them in this country today. If it comes, it will be the fault of the profession, but the public will suffer equally with them, for there will no longer be any compelling incentive for the better class of men to enter the profession and not only will the freedom of choice of a physician be taken away from the individual but the quality of service will be inferior. No considerable number of high grade men will be content to sink their individuality and be limited in their activities by state supervision, subject as it would unquestionably be to the uncertainties of party politics.

Group medicine is the answer which the medical profession has had to offer to the recognized disadvantages of the tendencies in practice at the present time, disadvantages arising out of the requirements of practice and the over-development of specialization. In the cities, diagnostic clinics in connection with the large hospitals have been established to provide for those who cannot afford to be passed from one to another for special investigation. In regard to the former, they are tending, in many places to be breeders of the spirit of commercialism which the medical profession has so long stood out against, the prevalence of which is the surest way to bring about the socialization of practice. That there are abuses of the out-patient privilege in public hospitals there is no doubt, but they are infinitely less harmful from every point of view than it would be to have medicine commercialized or socialized. The evils of abuse of clinics by those who can afford to visit a private physician can be measurably held in check and the diagnostic clinic is a less objectionable method of effecting some control over this abuse than are certain other devices. It would be a great pity to dwarf in the members of the medical profession their time honored willingness to render gratuitous service, where the conditions justify it, just as it may well be productive of harmful effects upon the natural, individual, humanitarian impulses if social service and various other uplift organizations become so highly developed that the individual no longer feels a personal interest or responsibility in helping the unfortunate. Humanitarian impulses are fostered by the opportunity to exercise them quite as effectually as muscles are developed by the occasion for their use. From the standpoint of medical education, there is much to be said in favor of the free clinics, as it is through them that the material for teaching medicine is derived and without adequate facilities in this respect, the best grade of instruction cannot be secured. There is also a limit to the extent to which even the patrons of a free clinic will tolerate the ministrations of social service investigators and preserve a feeling of satisfaction in the service rendered. All these activities add to the time spent in the procurement of the aid that the patients seek at the hospital and for many of them the medical service is of most import, if not of sole import. There is danger that an excessive development along these lines may contribute to the general unrest over charitably provided hospital treatment and convert the patrons of them to a program involving state medicine. The bearing of all this upon the thesis under discussion may not be easily comprehended, but these evils, whenever they have been permitted to advance to that stage, are traceable directly to the threshold of the medical schools and most of them would not have arisen had not

medical education been permitted to over-reach itself in certain directions. The remedy may be sought in large measure in the correction of some of these defects, and if the correction were applied in that way the public and the medical profession would alike be the gainers.

In the curriculum of the medical schools, clinical medicine and clinical surgery bear the same relation to the proper training of a physician that the three R's do to the efficient preparation of a scholar in the secondary schools. This tendency in these schools has been to take away from the time and quality of the teaching in these subjects and allot it to vocational subjects and other pedagogical make-shifts. What has been the result? We turn out pupils with a poor general education. They are indifferent spellers, they know but little grammar or geography, and possess poor equipment with which to proceed to an attack upon subjects requiring close application, *e.g.*, those in the first years of a medical school. In the medical school curriculum, the specialization within the two main subjects and the emphasis placed upon the recognized specialties take away from the fundamentals time that can ill be spared, and turn out poorly fitted specialists and general practitioners who have exchanged their birthright, namely a thorough grounding in medicine and surgery, for a "mess of pottage." How can this be remedied? The reform must start in the secondary and high schools. Their curricula must be formed of those subjects that contribute to the prime object of any broad education, *viz.*, mental discipline. When this is done, time will have been saved the student who purposes to enter a profession. If he can afford a college education and can find a college where his time will be well spent, let him have it, but there is abundant reason to suppose that a good academic course can be combined with the medical course and two degrees earned in two-thirds of the time now usually consumed. Eliminate all attempt to prepare anyone in the regular courses in a medical school for specialization. Discourage anyone from trying to plan a course with any such object in view, but offer a degree which shall be the equivalent of an M.A., to be won by any graduate in medicine after two years of work in a special course, part of which shall be spent in a hospital devoted to the care of the cases in which he chooses to specialize and part of which shall be spent in advanced research and laboratory work in connection with that subject. We shall then have qualified men in the specialties with a good general medical background, and the specialties will not be overcrowded. Furthermore, the public will have a way of knowing who the qualified men are in special lines, and last, but by no means least, the supply of really competent, all-

round practitioners will be substantially increased. Scientific study and research must be fostered. To do this, two or three schools might be endowed where the curriculum was arranged with that in view and from which the research scholars and scientific teachers and a few full-time clinical teachers might be trained, enough to meet the requirements of the medical schools and carry on the investigations that medicine and surgery are constantly furnishing the incentive for. Then the rural districts will not, as now, be calling vainly for doctors, and medical students will not be served with indigestible food, which frequently causes malnutrition.

REPORT ON THE RECENT "SCHICK TEST" CAMPAIGN.

BY JOSEPH GARLAND, M.D., BOSTON.

THE value of, and the method of performing the Schick test and producing active immunization against diphtheria, as well as the magnitude and seriousness of the diphtheria problem, have been so well explained by Dr. Benjamin White in the BOSTON MEDICAL AND SURGICAL JOURNAL of March 10, 1921, that we can do no better at the present time than to quote from this valuable article.

"1. *Theory of the Schick Test.* Diphtheria toxin causes an inflammatory action when injected into susceptible tissues. This reaction does not occur if the toxin is neutralized with its antitoxin before injection, or if an adequate amount of antitoxin is already present in the blood of the individual. Schick found that an antitoxin content of one-thirtieth unit per cubic centimeter of blood is ample, not only to render one immune to infection, but also to neutralize and prevent the inflammatory action of a small amount of toxin injected into the skin. Upon this phenomenon is based the Schick test. A positive reaction means susceptibility, a negative reaction shows immunity. Those who show a positive reaction may and do contract the disease; those who show a negative reaction may become carriers of virulent diphtheria bacilli, but do not develop clinical diphtheria.

"2. *Technique of the Schick Test.* The test is carried out by injecting intracutaneously one-fiftieth of a minimum lethal dose (M. L. D.) for a guinea pig weighing 250 grams. The State Department of Public Health supplies free an outfit, which contains sufficient titrated diphtheria toxin with the proper amount of sterile salt solution for fifty tests. The toxin is contained in a capillary tube, and when it is desired to perform the test, the contents of the tube are expelled into the bottle containing the salt solution. One-tenth of a cubic centimeter of this mixture represents the dose to be injected into the skin and contains one-fiftieth

M. L. D. of toxin. This diluted toxin must be used within a few hours after mixing, because it rapidly loses its potency when exposed to light and room temperature. The skin of the flexor surface of the arm, preferably above the elbow, is cleansed with alcohol, acetone or ether, and one-tenth cubic centimeter of the diluted toxin is injected into the epidermal layers of the skin. This is best accomplished by means of a short but sharp-pointed No. 26 or 27 gauge hypodermic needle. The 1 c.c. "Record," or other tuberculin syringe, is well adapted for the purpose. If the point of the needle has been properly inserted, with the lumen uppermost and visible through the skin, the injection should produce a small, slightly raised, white area, or wheal, which should move with the skin and disappear in about one-half hour. The injection should never be made under the skin. The technic of the test is easily acquired. The injection causes little or no pain, it is never followed by constitutional symptoms, and the site of injection requires no subsequent care.

"3. *The Positive Reaction.* A positive reaction begins to appear in 24 to 36 hours and is characterized by a circumscribed area of redness and slight infiltration which measures one to two centimeters in diameter. It develops gradually, reaches its greatest intensity on or about the fourth day, then fades very slowly, leaving a scaly, brownish pigmented spot. The positive result of the test represents the true irritant action of diphtheria toxin, and signifies that the individual possesses little or no antitoxin in the blood, and therefore may contract the disease.

"4. *A Negative Reaction.* The native diphtheria antitoxin in the tissues of an immune person neutralizes the injected diphtheria toxin, and on the day following the injection no signs are present, except the slight and fleeting mark incident to the insertion of the needle.

"5. *The Pseudo Reaction.* In some individuals, particularly in adults, a reaction develops which may be confused with a positive reaction. Owing to the hypersensitiveness of some persons to the protein of the diphtheria bacillus present in the toxin, a local reaction may appear at the point of injection. The pseudoreaction is distinguished from the positive reaction by its more rapid development. It appears usually within twelve to eighteen hours, and fades in about three to four days, leaving only an irregular area of brownish pigmentation and generally shows no scaling. In appearance the moderate pseudoreactions, at the end of the twenty-four hours, resemble very much the fully developed positive reactions, while the marked pseudoreactions show a considerable amount of infiltration with a central darker reddish area, surrounded by a fainter areola, which shades off into the surrounding skin' (Zingher). In order to exclude