plete and satisfactory graphic representation is scarcely to be expected. We can agree at least that progress is being made toward such an understanding.

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SOME FALLACIES IN THE ARGUMENTS AGAINST FULL-TIME CLINICAL INSTRUCTION[1]

IN a recent paper, published in SCIENCE, Dr. S. J. Meltzer comments upon two notable facts in connection with the present rather active agitation regarding full-time clinical instructors. The two facts singled out by him are: (1) The appointment of full-time professor of medicine, surgery and pediatrics, by the Johns Hopkins University, and (2) the disparagement of this type of plan by the council on medical education of the American Medical Association. Dr. Meltzer's paper itself constitutes a third notable fact, in that it represents one of the very few unqualifiedly strong appeals that have been made by a clinician in favor of full-time clinical instruction. Although engaged at present in a so-called fundamental research, the current of Dr. Meltzer's life has been clinical to so large a degree, that his conclusions can not be questioned on the ground of academic impracticability. He analyzes the report of the council with logical seriousness; and were it not for the artifice of a single italicized word, one would scarcely feel the flick of Meltzer's lash or realize the seriousness of the attempt of the council to laugh the case out of court. Dr. Meltzer, by rare grace and tact, forges an argument so uncommonly well tempered as to render supportive discussion almost unnecessary. And yet, if there be any force in the plea for full-time heads of clinical departments, it lies in the line of duty of those of us who are clinicians to develop its full strength by discussion.

In such a discussion, as indeed in all such discussions, nothing contributes so much to balance and rationality as does a proper conception of the historical perspective of the problem involved. It is essential to realize at the outset that the question is not a new one involving American medicine alone. Many men would have us believe that suddenly, as a result of this, that, or the other tendency, our clinical instruction in America has been found wanting, and that with typical American impulse we have set to moving in the sacred realm of education, the machinery of experiment. As early as the seventeenth century, Leibnitz attempted to justify his faith in quacks, on the basis that doctors were improperly trained as men of science, and that it was hopeless to look for the development of scientific teachings and methods in a practitioner, *der nichts thut als von einem Patientem zum andern rennen, und wenn er bey dem einen ist, auff den andern schon denket* (who does nothing but run from one patient to another and who, when he is visiting one patient, is already thinking about the next one). Almost a half century ago Billroth anticipated the Flexner report on Medical Education, in his "Ueber Lehren und Lernen," a work necessarily less modern in tone than Flexner's, less broad in the geographical consideration of the subject, but not a whit less emphatic in the assertion of corrective principles. Coming down to more modern times, we have the Report of the Royal Commission on University Education in London (1913) in which it is admitted that "the academic training received by medical students in London has not always been distinguished, and that the scientific spirit has been too often wanting." We in America have also found that, even in our best schools of instruction, the scientific spirit has been too often wanting, and we have found it wanting chiefly in the clinical branches. On this basis rests the agitation for full-time clinical instruction.

The phrase "full-time clinical instruction" signifies that the teaching of each major clinical subject be under the supervision of a properly qualified instructor, who shall serve as the head of his department, who shall devote all his energies during the working

[1] Read before the twenty-fifth annual meeting of the Association of the American Medical Colleges, Chicago, February 17, 1915.

school-day to the management of his department, who shall receive an adequate compensation for his highly specialized labor, and who shall be protected against the inevitable lures and enticements incident to his position, by a provision which denies him the right to accept private fees, or permits him to accept them only on such conditions as may be imposed by the university. This is the simple statement of the case. And as the question stands at present, its importance resides not in the working out of a detailed scheme of clinical instruction under such a plan;[2] but rather in formulating a critical judgment regarding the advisability and practicability of so modifying our method of clinical instruction as to make it conform to other approved methods of education.

And when we have said this we have hinted at one of the most paradoxically inexplicable phases of medical education. It may be stated that, almost without exception, *clinical* teachers realize the essential necessity for full-time men in all of the *fundamental* branches of medicine. The very canons of education demand such a system. Yet, a large number of these same clinical teachers assume that there is such a wide divergence between the teaching of the fundamentals and of clinical medicine, as to render wholly unwarrantable the conclusion that clinical teaching also should be based on that plan which alone is best suited for instruction in fundamentals. It is, for very self-evident reasons, natural that the scheme for full-time clinical instruction should have the strong support of most of the teachers of the fundamental branches. It is not so easy to explain the fact that opposition to the plan has come so largely from clinicians. Such a clean-cut division into camps is unfortunate, because it has set in motion a controversy tinctured with bitterness. The so-called laboratory men are charged with a tenacious hold on impractical ideals, limited by virtue of a narrow occupational horizon; and the clinicians are, in their turn, supposed to typify the old story, repeated in myriads of forms, of privilege clinging to tribute. Neither of these assumptions is entirely correct; both of them are essentially harmful because they drag the argument down to the low level of personalities. Disagreements of this sort usually rest on fallacious judgments. An unqualified advocate of the full-time clinical instructor, I have, for the past few years, noted various fallacies, patent or concealed, in the arguments against this plan of instruction; and the only object of this contribution is to examine these various fallacies, with the hope of clarifying a fairly well-confused topic.

Of all others, the fallacy most responsible for both bitterness and confusion is the assumption that full-time clinical instruction connotes a clean sweep, displacing all teachers who are private practitioners and replacing them by non-practitioners. Such a plan has the advocacy of no one. Barker, in his address on "Tendencies in Medical Education," falls into this particular fallacy when he develops the thought that "the present incumbents of clinical chairs" by virtue of "the rightfulness of the kind of work done by them" hold their positions in "good faith." He pleads the cause of these "honest, hard-working men" in such fashion as to warrant the inference that they are all to be displaced, and that their displacement is a breach of moral contract on the part of the university. Dr. Barker certainly does not, nor should any one else, minimize the value of such services as are rendered at Johns Hopkins University, for example, by those clinical men who are not on a full-time basis, simply because at that university there are academic heads to medicine, surgery and pediatrics. It is supremely important to recognize the fact that the varying character of clinical material will always make it both advisable and necessary for the university to offer place and preference to the properly qualified clinical teacher, irrespective to his affiliation with private practise. The full-time clinical instructor, together with his staff, is a necessary adjunct in organizing, coordinating and correlating

[2] Details of organization are purposely omitted, such, for example, as the number of full-time salaried assistants necessary to the successful conduct of a department.

the practical as well as the investigative work of his department, just exactly as the dean of a school is an adjunct in developing school spirit and school policy. The advocates of the full-time instructor should never, not even implicitly, subordinate the teaching value of the properly qualified private practitioner.

Even broader in scope is the fallacy that there is an important and essential variance of principle in teaching the clinical phenomena of disease, and in teaching function and structure or aberrations of both, in the laboratory. It is difficult to analyze this fallacy and at the same time avoid an undesirable discussion of the primary pedagogic principles involved in teaching medical students. It may be pardonable, however, to dip into abstractions just deeply enough to say that whether our efforts at teaching be confined to the fundamental or to the clinical branches, our aim is toward equipping our pupils to form proper judgments. If, as a result of their training, our students can affirm or deny conclusions, either by proper process of reasoning or by the direct comparison of objects to ideas, we may rest easy in the thought that the discipline of their medical education has been fruitful. And the process by which they should be taught to form proper judgments is exactly the same in the hospital ward as it is in the laboratory. In both places the student is taught to know certain fundamental truths, and from these he is taught to reason certain definite conclusions. The fact that in so many hospital wards and clinic rooms the student is taught *to know,* to the exclusion of being taught *to think,* is responsible, in large measure, for the fallacy that clinical teaching is, part and parcel, separate and distinct from fundamental teaching. If one doubts that clinical teachers err with hopeless frequency in this direction, let him pick up at random a number of clinical text-books and examine them critically. The conclusion will be unavoidable that preponderant stress and effort is laid on crowding the student with facts—on teaching him to know. One of the most recent clinical text-books states in its preface that the very best a teacher can hope to do is to teach his student to know.

This particular fallacy regarding the specific difference between fundamental and clinical teaching should not be dismissed by merely stating it. It is essential to expose the danger to which it leads. And this can be done no better than by quoting a sentence from last year's report of the Conference on Medical Education. This report states that

> Clinical teachers know that in the very nature of things the teaching of anatomy and pathology is in no way parallel to the teaching of medicine and surgery, because the teaching of medicine and surgery is inseparably associated with the practise of medicine and surgery.

This allows us absolutely no other alternative than the conclusion that anatomy and pathology are *not* inseparably associated with the practise of medicine and surgery. Surely the council can not hope that this conclusion will go unchallenged.

On the part of the clinicians there has always been a tendency to introduce this notion of the subtle, specific teaching value of private practise as a sort of abracadabra, charm, amulet, something to conjure with in the realm of medical education. They have studiously avoided the fact that the plan for full-time clinical instruction contemplates developing the principles of practise in their most utilizable form, namely from a variety of clinical material, intensively correlated and studied, and housed under one roof. Is there more to be learned of the basic traits of human nature on Fifth Avenue, or on Michigan Avenue, than there is in the wards of Bellevue or of Cook County Hospital? Or does the wealthy patient have a more legitimate demand on a larger share of the sympathy, interest, pity, or sweetness and light of his doctor's pervasive personality than does the helpless sufferer in the charity ward? The plan for full-time clinical instruction *does* contemplate the full realization of the intimate relationship between teaching medicine and practising medicine; what it does *not* contemplate is the injudicious mixture of private practise and teaching. And in this particular, the plan is strong against all

attack or argument, for the very reason that the majority of clinicians do not (and very properly do not) use their private patients as teaching material and could not even if they were so minded.

And all this leads up to another false assumption. It is argued that since from the standpoint of medical education, so little store is laid by a man's capacity to gain and hold the medical confidence of a large clientele, and to serve it intelligently and well, it necessarily follows that the rôle played by the private practitioner is less ennobling than that of his fellow who elects to be exclusively a clinical teacher. The practising physician very naturally resents such an inference. In reality, any conclusion which sets a comparatively lower value on the services of the private practitioner than on those of the exclusive clinical teacher, by reason of the fact that material remuneration is greater in one field than in the other, is a *non sequitur*. Certainly all thinking men realize that between the *spirit* of practise and the *spirit* of teaching there is no essential ethical difference. The value of effort in either field is directly proportional only to the grade of intelligence and purpose back of it. But between the *demands* of practise and the *demands* of teaching there is a variation so pronounced, qualitatively and quantitatively, as practically to preclude the proper performance of both these functions by the same individual. The full-time plan, therefore, rests upon this very rational conception of the case, and implies absolutely no measure of comparative worth between the vocations of practitioner and teacher.

In the teaching of such eminently practical branches as law, engineering, commercial chemistry, and other technical specialties, the need of the full-time instructor has been recognized and met. There seems to be nothing specifically so different in the practise of medicine as to demand that it be regarded as an exception in the general field of education. On the contrary, the teaching of clinical medicine demands the services of unattached men more urgently than does the teaching of any other practical art or science, because the two purely physical elements of time and fatigue enter so intimately into the problem. Barker has emphasized the overwhelming amount of correlated knowledge to be appropriated by the clinical teacher of to-day; an amount of data almost sufficient "to suffocate" him. This process of appropriation requires, in addition to intelligence, a very definite number of hours and minutes each day. An active practise rarely grants the necessary surplus of time. If, however, by a process of "speeding up," the practitioner succeeds in cleaning his slate, in order to fulfil his teaching obligations, he is very apt to find himself face to face with that other disturbing physical element—fatigue. It has always seemed a remarkable fact that the study of fatigue in its relation to efficiency should have been confined to the industries. We accept as true the fact that more than a given number of hours in his cab renders the locomotive engineer an unsafe person to differentiate between the two primary colors red and green; but we have to prove by argument that the busy surgeon can shoulder the enervating duties that confront him day and night, and still be fit for one of the keenest of all mental disciplines—the proper teaching of science.

And let us pause here just long enough to emphasize this word science in its relationship to clinical medicine. Not the least significant of the various fallacies that we are examining is the one that has to do with the thought that the fundamental man *must* be a specialist, and *must* be on a full-time basis because, although of course he is a teacher, he is also an investigator and must therefore have the necessary time for *scientific* research. By inference again we are subtly led to believe that scientific research is confined to anatomy or physiology or one of the other cognate fundamental branches of medicine, and that it need not be reckoned with in considering the teaching of the clinical branches. Those who favor the plan of full time clinical instruction are influenced in no small part by the hope that the properly qualified clinical teacher, favorably situated, will foster, stimulate and direct scientific clinical research of a higher order than is commonly produced under our present system of conducting clinical teaching. Clin-

ical investigation is, of all other types, probably the most intricate and difficult, for the reason that the problems studied are of such a nature that the factors entering into them can not, as a rule, be varied at the will of the investigator. If, therefore, we hope to encourage worthy product along the lines of scientific clinical research, we must, to say the least, provide the clinical teacher with an environment as favorable as the one with which we surround the fundamental teacher. It is no answer to this argument to quote the numerous examples of epochal discoveries made by busy practitioners. The superman will inevitably enrich his field, in the face of compromising odds or even of grueling adverse conditions. The problems of education always deal with averages, and what we desire to see is a system attuned to producing from among the common ranks of medical men a proportionately large number of clinical teachers and investigators.

We base our hopes on the full-time plan as an aid in attaining this worthy end, and all seems well until we are rudely halted by the oft-cited example of Germany, the nourishing mother of all that is best, and stable, and approved, in medical education. Germany has no full-time clinical instructors, and, what is more, the very men whom we all recognize as her leading clinical educators have not a particle of sympathy with the American full-time plan. Here truly is a stumbling block. And yet, the explanation is not as difficult as it appears to be. German clinical teachers, in spite of their unqualified rights to practise, have mortised themselves into medical history, so that their names fairly dot pages. More than that, practically every great German clinical teacher has developed about him a so-called school of younger men. By contrast, we have at home a proportionately very small number of names that even the most chauvinistic among us would set up with the leaders of German clinical thought, and only comparatively few of our clinical teachers have grouped a school of enthusiasts around them. But this contrast does not signify that the German clinical professor is efficient because of his uncompromised right to practise. At all events, it would be difficult to establish proof to this effect. It seems much more likely that he is efficient in spite of the fact that he shoulders the distractions of practise. Indeed, those who have come into intimate contact with the directing heads of clinical departments in Germany know that many of them resolutely set themselves against these distractions. Friedrich Mueller, of Munich, may be selected as a type. Mueller considers his two-hour *sprechstunde* devoted to private patients, as a type of relaxation, comparable to golf, mountain climbing, or other forms of diversion. No inducement will persuade him to lengthen the office hour, and he refuses to make extra-urban visits, under ordinary circumstances, unless there be some teaching value inherent in the call. His serious work is teaching and directing, to both of which he devotes consummate care, and consequently a large amount of time. Between Mueller as a teacher of medicine and, let us say, Marchand as a teacher of pathology, there is no essential difference. They are both so-called fundamental men, each in his own specialty; and Mueller represents the type that the advocates of full-time instruction in America hope to develop—the fundamental clinician as teacher.

If we be asked why we concede that private practise has not militated against the development of the highest type of clinical teacher in Germany and has so markedly militated against it in America as to call forth an edict of interdiction, we can answer only that the variance between German and American culture and traditions so profoundly influence thought and act as to render it impossible to graft, unaltered, a system of thought from one country to the other. It is likewise equally impossible to argue that because certain conditions are favorable from an educational point of view in one country, they must of necessity be favorable in the other. The German is the type of patient plodding lover of *gemuetlichkeit*, who, certainly up to recent times, did not labor in medical fields under a very heavy stress of commercial competition. Tradition requires that he advance to scientific preferment only through a dozentship, and this in turn implies approved excellence as teacher or producer. The American, on

the other hand, is the mercurial, restive type, who hasn't even a word in his vocabulary with which to translate *gemuetlichkeit,* and who labors medically in a strenuously competitive atmosphere. The essence of the matter is simply this, that up to now the German clinical professor has, as a rule, needed little or no protection against himself, whereas the American clinical professor has so frequently demonstrated the need of such protection as to call forth that forcible truth from Dr. E. P. Lyon, who characterized clinical professorial selfishness by the phrase "lying full length in the trough as he eats." If a sufficiently large number of American private practitioners had demonstrated their capacity to combine teaching and practise as the Germans combine them, there would probably be no call for the full-time clinical professor. They have failed to demonstrate this, and they can not explain that failure on the basis of German example.

Indeed, this failure on the part of the clinical teachers to teach as intensively as do the instructors in the fundamental branches is alone responsible for the agitation for the full-time clinical instructor. Whether they accept it or not, the burden of proof lies upon those who argue against a plan that attempts to do for clinical teaching exactly what has been recognized as essential in practically every other branch of education. For many of us it is difficult to see how the introduction of full-time clinical instruction can possibly fail to accomplish most of those things which we hope to see result from it, for all of us who are interested in seeing the reform meet with warm, broad support, there is much chagrin and disappointment in contemplating the half-hearted support and whole-hearted opposition accorded it. This chagrin and disappointment may be considerably tempered, however, if we bear in mind the truism spoken by President Lowell in his address before the New England Association of Colleges, last year. Said Mr. Lowell:

> Education is the last of all things to follow the stream of human thought and progress. It is still mainly in the deductiv stage.

If Mr. Lowell be correct in his statement, we may seek solace in the thought that we have at least an explanation for the fact that so many well-meaning clinical men experience difficulty in accepting an inductive syllogism the conclusion of which is "The teaching of clinical subjects should be under the guidance of exclusive clinical teachers."

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THE death of Professor Bessey removes a conspicuous figure from among the group of older American botanists. No botanist was better known personally among his colleagues. for he was eminently social, and enjoyed the various scientific meetings that brought his friends together. It is certain that no member of the botanical fraternity will be more missed at these meetings than Professor Bessey, for he was always the center and life of any group of which he happened to be a member.

The usual biographical data dealing with birth, training and official positions may be obtained from "American Men of Science," and need not be repeated here. The writer wishes to speak of him as an old acquaintance, and of his place in the history of American botany.

Professor Bessey first became known to botanists in general in connection with his position in the Iowa Agricultural College at Ames, and during his fourteen years (1870–84) of service there, his reputation as a botanist became established. In 1884 he began his long period of service at the University of Nebraska, where for thirty-one years (1884–1915) he was not only a commanding figure in his subject, but also in the university and in the state.

In the history of American botany, Professor Bessey stands for the introduction of a new epoch. Before 1880 the study of botany was practically bounded by the taxonomy of the higher plants, with such gross morphology as enabled the student to use a manual. In any event, the collecting and naming of plants was the chief botanical pursuit. For nearly thirty years before 1880, morphology as we understand it now had been developing in Germany, under the original stimulus given