

FRANKLIN PAINE MALL

The Story of a Mind

BY

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“Pass It On”

Mall's outstanding contribution to medical education was in the stress which he laid on the training of students in research. At the beginning he had in large measure to build up a staff through the training of his own students since at that time there were not only relatively few places where research could be done, but also relatively few who were interested in it. So from the start, Mall began to put the idea of research before the occasional student whom he thought might be interested in it. While Mall believed thoroughly that a chance for self education was the only thing that really counted in education, he took seriously the duties which he felt devolved upon the instructor. He considered first, that the instructor could teach by example only if he were a student himself; secondly, that he must make all conditions right for work—quiet, good material, and above all a spirit of freedom; and third, he must have the power of inspiring students to want to work. Mall did make the conditions right for the entire student body, but his most outstanding contribution to education came from his ability in directing research. How successful he was may be judged from the number of his students who pub-

lished the results of investigations and from the number of chairs in medical schools that were filled from his department. His staff was called away to other schools almost faster than he could train them. About twenty-five chairs of Anatomy were filled from his department.

In the last years of the last century, research was new enough for the members of the faculty of our medical schools but almost unheard of for students. Mall believed in selecting a few whose bent might be toward research and giving them a chance to start early in their medical course; that is, when the work of each department was near its close, he thought that the students who had been specially interested might be given a chance to start in original investigation. That he did not advocate research for large numbers is clear enough from the fact that he often said that an instructor, certainly unless he was very experienced, ought not to take more than one at a time and he himself never took more than three or four. Here again the principle that the teacher should not so overload himself with work that he did not have his major energy for his own work prevented him from believing that large numbers of students should be started in research. He made his staff free either to take a research student or to give elective courses, and he was emphatic that no instructor should be forced to take research students; it should be a free choice on both sides, for it was essential that student and teacher work together

in sympathetic understanding. Mall would never take a student unless he judged that research was the major interest to him so that he would put all of his free time into it and not take on any other extra work. If Mall already had enough students he would never take more; also if a student asked him about a problem really belonging in another department he always referred him to that department. In his views of the research that a student might do, he always intended that it should be a start toward truly professional work; the mere writing of a thesis based on the study of the investigations of others he considered as suitable for required or elective courses but not as research.

In an address written in 1904 for the Michigan Alumnus, on the Value of Research in the Medical School, Mall wrote these words:¹ "It may be mentioned that a bit of original research on the part of the student is by all odds of the greatest educational value to him. It gives him a standard by which he weighs all things later in life, and enables him with much more certainty to separate the real from the bogus in our superabundant medical literature. Were the ranks of the medical profession filled with men who had done some scientific work in their student days, we would not have witnessed the opposition to the tubercle bacillus as the cause of tu-

¹ F. P. Mall, "The Value of Research in the Medical School," *Mich. Alumnus*, May, 1904, 3, 395.

berculosis or to the treatment of diphtheria with anti-toxin. So much am I in favor of students of medicine undertaking scientific work that I would require for the degree of M. D. a dissertation of some merit from each candidate. I realize fully that but a small per cent of the five thousand graduates of 1903 could present a satisfactory dissertation, but we could make a beginning by being lenient with those who do by excusing them from a great deal of the unnecessary work which is now crowded into the medical course. In other words, the thesis work might be placed in the elective list, and in many instances it would be undertaken by the better students. If the dissertations could be encouraged in some way it would stimulate scientific work in the medical schools, would tend to reduce the number of graduates, and would improve the quality of the physician."

At the same time it is also very clear that Mall thought that the students who were fitted to go into research professionally constituted a small and selected group. Dr. Eliot R. Clark has in his possession a diagram which Mall once traced, indicating that from 10,000 students there might be selected 1000, and from them a group of 5 might start in research. Of this group he said that all might make specimens, but only one might really study them—and that perhaps even he might or might not come to any logical conclusions, that is develop into an investigator.

In 1912, Dr. Cecil K. Drinker, now Professor of Physiology in the School of Public Health, Harvard University, then a third year medical student at the University of Pennsylvania, published an article in *Science*,¹ in which he made a plea from the standpoint of the student whose interest was in research and shortly afterward he received the following letter from Mall:

My dear Mr. Drinker:

I congratulate you for your splendid article in the last number of *Science*. It will do the cause of freedom of medical education much good. I have championed this cause for 20 years and am much of the opinion that a society, or research committee of students, in the enlightened medical schools would do much to hasten research work among students. Such a committee could keep the various research students informed and ultimately they might at last bring about a condition by which students who present a thesis of merit would be given due credit for it. In my opinion the regular work could easily, and to advantage, be reduced to two years, leaving two years for elective work. The new examination systems introduced here, as well as at Harvard, are intended to enable the student to make his course more likeable, as well as flexible, than at present.

Sincerely yours, F. P. Mall.

It gave Mall genuine pleasure when students knew what they wanted and had courage enough to ask for it; his attitude in this might easily have seemed to a less liberal colleague like an inciting of students to revolt.

¹C. K. Drinker, "Undergraduate Research Work in Medical Schools," *Science*, 1912, **36**, 728.

In dealing with his special students, Mall certainly carried out throughout his entire life the watchword which Ludwig had given to him, namely, "Pass it on," for he certainly gave richly to his students of the inspiration which he had himself received from Ludwig and looked upon his work with students as a tribute to him. In his teaching Mall was individual; he was neither like His nor like Ludwig. Unlike His, he followed each problem carefully; at the start he either showed the student the methods to be used or described them, but he never made any preparations for the student. In this, I think that he was unlike Ludwig, who did work with his students. In his own work, Mall never made but one experiment in a day, that is, he never did his own work when he was fatigued, and after the one experiment was finished he always had ample time to visit his students. He loved to see new preparations, and if one had much to show him he would linger. He never seemed in any haste if there were new specimens or ideas to discuss; but he was a past master in never taking from the student the pleasure of discovery; all that the student could get for himself was left for him to do. When Mall had the business affairs of the laboratory to consider, he worked quickly and with decision; he delegated such matters quite freely to members of his staff and then considered only such departures from the usual procedures as it was necessary to refer back to him, but when so consulted he acted quickly. But toward

research, for the study of new specimens or the discussion of ideas, he always had abundant leisure, he never seemed in any hurry, and yet he saw all of his students each day. This sense of leisure for thought and his love of playing with ideas would be recorded by all of the students whose research he directed. All of them would also testify to his great generosity. It is said of Ludwig that he gave his ideas freely to his students; this Mall did too. Everyone of them he started with an idea, and then Mall always identified this idea with the student's name. He loved to see ideas grow and was completely free from any impulse to claim them as his own. Never was a personality more completely objective; his pleasure lay so genuinely in seeing the reforms which he instigated and the science which he loved move forward, that there was no hidden ambition to have the world recognize how great might be his influence in the forwarding of these objects. To an extraordinary degree he worked through others and set the stage so that they and not he might get the credit. This was his characteristic with his research students; only once did he ever do any joint work with any of them and that with A. W. Meyer in the Monograph on pathological embryos toward the close of his life. His own research, which he continued throughout his entire life, never lessening it with increasing administrative duties, represents his claim for constructive thinking, while all the work that he

directed was given to his students with the greatest generosity.

The mental freedom which Mall gave to a research student can be gleaned so clearly from the following letters that I venture to quote them, even though they refer to my own work.

von Frey to Mall:

March 14, 1915.

Dear friend:

The excellent work of Prof. Sabin I have now made the basis of my lectures on the lymph following the very clear presentation of the subject in the Keibel-Mall Handbook. I am however not convinced concerning the relationship between the tissue spaces and the lymphatic vessels. If the lining of the lymphatic channels were a closed membrane without any openings, then the passage of the fluid from tissue space into lymph channel would have to be accomplished under conditions similar to those affecting the passage of plasma from blood vessel to tissue space, that is to be affected by lowering of pressure and of protein concentration. This seems to me to be very unlikely. Rather would it seem to me that the lymphatic endothelium should be fenestrated, and the evidence you yourself presented from the injections of the central lacteals of the villi some time since is in favor of that view. Your injections showed the injection mass entering the reticular tissue spaces from the tip of the central lymphatic.

Yours, von Frey.

To this letter Mall replied:

April 12, 1915.

Dear Professor Frey:

* * * * *

I read with interest what you say about Miss Sabin's work, and the objection you raise to closed lymphatics is the one that

I have constantly held up against her in her work. While I have gradually become convinced that practically all lymphatics are closed, it still remains to be explained how such large quantities of chyle flow into them in the villi of the intestine. A better example is the one obtained from the terminal lymphatics of the liver. As you know, an injection in the portal vein or gall duct reappears in the lymphatics immediately, but over against the argument in favor of open lymphatics in the villus is the one in favor of a closed epithelial covering. You know we used to think that the epithelial covering fell off during absorption, but now it remains intact and there are no direct communications between the lumen of the intestine and the stroma of the villus. Furthermore, we have repeatedly observed the lymphatics in the tadpole's tail taking entire red blood corpuscles in through openings formed by moving protoplasm. Still I do not think that open and closed lymphatics necessarily bear on their mode of development. I am very sure that as the lymphatics grow out, they are always closed. Then you probably remember that Professor His was never convinced that open lymphatics as described by Ludwig could be proved to exist. I think Miss Sabin's discovery regarding the growth of lymphatics is one of the very greatest importance for it allows us to separate most distinctly lymph spaces from tissue spaces. It is an extremely small point, but has caused an immense amount of trouble for the last 200 years, and I am afraid when I go abroad again, we shall have to fight it out, but at any rate this fighting will be more interesting than the present European war which seems to be so pointless.

With best wishes,

Very sincerely yours, F. P. Mall.

In this connection Mall's openmindedness is also well illustrated by a letter from him to Dr. McClure who had asked Mall if he would receive on his staff

a young man who represented a different point of view on lymphatics from that which was being developed in Mall's laboratory. Mall's reply accepting the new instructor was as follows: "We would give him every reasonable opportunity to develop himself. Furthermore he will be able to teach anything which he believes is true, and if he brings forth the necessary evidence, I would not be adverse to taking up the old theory which I supported for quite a while. You may be surprised to learn that I antagonized closed lymphatics for a number of years, and it was only with difficulty that a member of the staff forced me to change my views. I was brought up by the Ludwig school which believed that the lymphatics were open at the periphery and that all lymphatics rose near the mid-dorsal line or in the extremities then gradually grew to the axis of the body. Some idea like this you will find running through Budge's papers.

"I think it would be fine if people who held diametrically opposite views regarding any scientific question would work together in a neutral laboratory for a while to see whether between them they could not find the truth."

All of these letters show that Mall maintained a critical attitude toward all of the work of his students; he stressed at all times the true scientific attitude that one must be ready to give up cherished theories as soon as evidence for them failed. But, on the other hand, he thoroughly enjoyed the stimu-

lus of controversy and thought that as long as the evidence seemed adequate one should defend his theories. Mall loved to talk of his theories and needed a good listener to his monologues in which he really thought out ideas; while he might seem wholly wrapped up in his ideas, he was, nevertheless, practically clairvoyant in understanding the person to whom he was talking.

Mall was a real companion to his staff and his research students. When one realizes how much he accomplished, it is remarkable how many hours he had to give them. This was due to the precision with which he did his own experiments and the speed with which he made judgments about the problems of running his department. Thus each day he had ample leisure for his students. Not only did he see them in the laboratory but he invited them over and over again to his home.

Mrs. Mall did not complete her medical course, but she went far enough to be able to grasp Mall's work. Her training and her interests qualified her to follow the progress of scientific medicine and the problems of medical education which absorbed him. Perhaps no one understood so well or sympathized more completely with the fact that Mall's basic interests were those expressed in the simple life of the scholar. She read his papers and followed his research; she was an intellectual companion, sharing his ideals and accomplishments and supporting him in all of his intellectual adventures. She shielded

him from every care in the home and during his last years she helped him in his research in the new department of embryology. Their two daughters were in college at the time of Mall's death so that he did not follow their advanced work, the older, Margaret Mall, studying architecture and now teaching at the Massachusetts Institute of Technology, and the younger, Mary Louise Mall, taking advanced work in chemistry at The Johns Hopkins Medical School. Mrs. Mall had a genius for entertaining and loved to have young people in the home. She joined with Dr. Mall in making the home a center for hospitality and culture. All that Ludwig gave so abundantly to Mall in the way of culture, both Dr. and Mrs. Mall gave to us and when some of us would say that they did too much for us they would both reply: "Well, pass it on to your students later on."

Mall spent most of his evenings at home; he was too frail for much social life. He was fond of walking and there were many stories of a walking trip which he and Dr. Welch had taken together in the Hartz Mountains in their student days. I remember that there was an annual fishing trip to the Gunpowder, a stream near Baltimore, in which it was reported that there were gudgeon, but I do not remember seeing any fish. Dr. Welch has told me that Mall was very popular with his colleagues; that his remarks were pithy and caustic; and that his judgment was superb. His oldest friends in Baltimore were Dr. Welch and Dr. Halsted; in one of his early

letters to his sister, Mall wrote of Dr. Welch that he longed for real friendship with him, not just an acquaintanceship, and indeed he had it in full measure. During his first year in Baltimore, as Fellow in Pathology, Halsted and Mall formed a friendship rich in enjoyment and Dr. Welch told me that after Mall left Baltimore there was never a vacancy in any department of the University whatsoever for which Halsted did not urge Mall's appointment! The Flexners were among his dearest friends and he followed their work with the closest interest. Dr. Simon Flexner's work at the Rockefeller Institute had great influence upon Mall in the founding of his department of Embryology, as will appear later; and Mr. Abraham Flexner says freely that in all his work for the advance of medical education there was none on whom he relied as much as on Mall.

In a certain sense Mall was more of a giver than a receiver from his friends; from the start his ideas always seemed advanced here in America. There was one of his early letters to His, in which he said, about a paper he had written, "These ideas will not seem new and strange to you, but here I am counted as a radical." He was more interested in the full range of educational problems than those about him. Thus, for example, Halsted's mind was absorbed with the problems of research, and he took relatively little interest in Mall's continual crusade for better medical education. Thus, Mall was to some extent alone; most of the summers he took his family

to Europe and when the war broke out I think that Mall felt in a very special way cut off from his own group, from that certain maturity of mind which is more characteristic of Europe than of young America.

His influence in directing the research of his staff and his students can be best estimated by considering the work which was done by them under his direction and stimulus. The study of the vascular system was one of his outstanding interests. The anatomical laboratory in Baltimore was situated only a block away from an abattoir, where a large number of pigs were killed each day. It has often been said that the embryo pigs which were so abundantly obtained from this source made Mall's department. Early in his work in Baltimore he started applying the methods of injection to the study of the blood vessels in pig embryos. The first student to use this material was Dr. John Bruce MacCallum, a most brilliant student, in whose early death Mall lost, as it were, a son. This material was then taken over by a series of students. It formed the basis of the brilliant studies on the development of blood vessels by Dr. Herbert Evans, published finally in the Keibel-Mall Embryology; likewise it was used by Dr. George L. Streeter, myself, and others, whose studies were published in the *American Journal of Anatomy* and the *Contributions to Embryology* of the Carnegie Institution of Washington. All of this work was finally summed up by Dr. Streeter in the generaliza-

tion that the pattern of the blood vessels at each stage of development is to be considered not so much as foreshadowing the adult pattern but as adapted to subserve the needs of the developing embryo at each stage. Closely allied with the study of the development of the blood vessels which was thus made so outstandingly a problem of Mall's department was the work on the development of the lymphatics. The studies on lymphatics by Eliot and Eleanor Linton Clark, and now of their students in turn, were of the greatest significance. All of this work culminated in the view that the lymphatic system is a part of the vascular system and develops under the same principles and that like blood vessels, lymphatics are in the main closed vessels. The modification, "in the main," is necessary for it is now so convincingly established that in one organ, namely, in the spleen, the blood vessels are open; for in the spleen the fenestræ of the lining of the veins are as clearly to be seen under the microscope as the open door of a room.

In embryology the mantle of His fell upon Mall and he in turn became the leading embryologist of his time. Mall's own work in embryology was largely with human embryos and it was Minot's laboratory at the Harvard Medical School where comparative embryology was chiefly developed. The work of the students in Baltimore was in part with human and in part with comparative material. Their work included the studies on the development of the mus-

culature of human embryos by Dr. C. R. Bardeen and Dr. Warren Lewis; the development of the lung by Dr. Joseph Flint; and of the pancreas by Dr. George Corner.

Fully as characteristic of Mall's interests as the preceding work was the neurological research of his department; there were the early studies of the development of the fiber tracts on the human brain which have already been mentioned; and then later, the problem of the development of the brain, where the work was left off by His, was taken over in Mall's laboratory, notably by Dr. George L. Streeter, and has become one of the major interests of the Carnegie Institution for Embryology. Finally, there were the more physiological aspects of the subject, represented by the work of Lewis H. Weed and his students.

In this connection must also be mentioned again one of the most significant advances from Mall's department; not, however, from the work of a student but rather of one of his staff. I refer to the outstanding discovery of Harrison of the method of tissue culture, which grew out of his efforts to prove that the nerve fiber could grow out from a single nerve cell to its characteristic ending without the aid of any accessory cells, either of its sheath or of the mesoderm through which it made its pathway. This was done by showing that nerve could grow outside the body. This epochal discovery, with all of the developments of the methods of studying

living cells, is one of the most outstanding American contributions to scientific medicine and biology.

In the next chapter it will be made clear that Mall did not simply devote his energies to the running of his own department but extended his influence widely in America largely by means of the development of the anatomical journals and the American Association of Anatomists. He was constantly on the alert to find the young men who were interested in research in the country, and the following letter which he wrote to Dr. Charles R. Stockard in 1907 is a characteristic example: "I wish to thank you very much for your papers, the one on cyclopia being of great importance to me. I would like to ask you two questions: (1) Do you wish to join the anatomists? If so, I would be glad to propose your name. (2) Are you so wedded to pathology that you are unwilling to go into anatomy? Where do you belong?" Then in January, 1911, he wrote again to Stockard:

I saw Donaldson in Philadelphia a few days ago and he informed me that you had succeeded in producing spina bifida in mammals by subjecting the mother to the vapors of alcohol. If this is correct, you have outdone yourself by making another great discovery. Please inform me whether this information is correct and if so I should be much pleased to learn how constant are your results. It is also clear to me that if your services can be secured, you will make a great professor of anatomy. If your university were wide awake, they would put you into that vacant chair which Polk announces in Schurman's last report. Anatomy is not so bad a science and

it will not be bad much longer if it procures enough eminent leaders to make it good. Loeb has written an article for the Record on teaching of anatomy which will interest you.

When Dr. Stockard was appointed to the Professorship of Anatomy at the Cornell University Medical College in New York City in March of this same year—1911—Mall regarded it in a sense as the fruition of the things he had been working for. He wrote to Stockard: “ I am immensely elated over your appointment to the chair of anatomy at Cornell. . . . You will do ever so much to add dignity to the profession of anatomy. I also congratulate you upon your great opportunity. I have only one bit of advice to offer. Master your whole field and be your own demonstrator of anatomy. To carry through a reform you must take charge of the important course. . . . Your great opportunity, as I see it, is experimental anatomy, a field you can lead in so easily, which is bound to be the anatomy of the future. The old anatomy is bankrupt and I see no reason why you should attempt to revive it.

“ Don't worry about the halter you have missed in failing to serve an orthodox apprenticeship. The lack of this halter, although you will miss it, will save you.” Then, a few days later, Mall wrote to Stockard that he wanted to prepare a notice of his new appointment for the *Anatomical Record*,¹ and said: “ You may not like my suggestion to ‘ do

¹ Unsigned editorial; “ Reorganization,” etc. *Anat. Rec.*, 1911, 5, 415.

you ' in this way but my motive is altruistic. I set myself the task twenty years ago to reform anatomy, and now, since the last important post of the enemy has fallen, you cannot blame an old promoter for wanting to write a farewell note. If the reform, as far as it has taken place, is a good reform, the newer generation will have to be more productive and medical men will have to become more scientific than they have been." This I regard as one of the most important of Mall's letters. It shows so clearly that he worked as a general, planning a campaign for years in advance. It shows, too, what were the reasons for his campaign—to make the next generation more productive and more scientific. The note in the record, which was unsigned, is in part as follows:

. . . The improvement in medical education which has taken place in America during the past twenty-five years is in large measure due to the absorption of medical schools by universities. As a result of this, the quality of the work in the fundamental scientific branches has been raised to a university standard. The same reformation has not yet taken place in the clinical branches. The departments teaching the fundamental scientific branches have been reorganized and competent specialists have taken the place of amateur teachers who were often mere exploiters. . . . Growth of anatomical science could not take place in departments of anatomy which existed only for the sake of surgery, but instead it took root in the departments of zoölogy, physiology and pathology where the use of the microscope was understood. Gradually this general development reacted on anatomy and professional anatomists were enlisted in the cause. These naturally de-

manded as their field of work the whole science of anatomy, and the part-time professor of gross human anatomy began to find himself without a vocation. Anatomy of the living body displaced anatomy of the cadaver. The scope of the work was necessarily extended to include general anatomy and embryology.

The election of Professor Stockard to this chair of anatomy in the Cornell University Medical College, is an event of much importance, for he is a modern, progressive and scientific anatomist, whose investigations give assurance that the work there will be of high quality. There is every reason to hope that this new department will in the near future take a prominent position in this country. Dr. Stockard's investigations have shown that activity and rest have no influence over the rate of regenerative growth, and that the process of regenerating tissue has a most exhausting effect upon the animal body. He has also shown that by means of chemicals, defects may be produced which offer favorable material for the analytical study of complex organs and by changing the chemical environment in which eggs develop it is possible to cause them to form a great number of monsters of exactly the same type as those occurring in nature. Thus by properly arranging the chemical treatment he produced from normal eggs with remarkable regularity a specific type of monstrosity, for example, cyclopean monsters, which observation must be regarded as one of the most important in experimental teratology. His work shows acumen in ascertaining the important points of a problem and sifting the value of the evidence. It is clear that it is his belief that scientific anatomy concerns itself with problems rather than with the indiscriminate collection of data for their own sake. Dr. Stockard is an experimental anatomist whose broad foundation insures scientific anatomy at Cornell. He will stimulate a scientifically productive attitude to develop broadly along the several phases of anatomical investigation. Of necessity this will make the

department more useful to the practical courses which follow and depend upon it.

I quote this at length for two reasons, first, because I remember so distinctly Mall's excitement and elation over Stockard's experimental production of cyclopa, and that he said to me at that time, "How seldom one sees research workers as happy over the discoveries of their fellows as over their own, and yet they ought to be for the real motive is to understand nature." The second is that the whole episode brings out so well Mall's concept of enlarging the field of anatomy to cover every phase of the subject and the clearness of his view that the fundamental scientific branches in medicine had to become experimental no matter how predominantly descriptive they had been in the past.

The note by Jacques Loeb to which Mall referred¹ brings out this idea in a most interesting fashion, for he said that anatomy had originally been identified with the search for the nature of life and that originally the anatomists were primarily physiologists, devoting their energies to understanding the functions of the human body and the nature of disease. Loeb thought that it was Johannes Müller whose enormous productivity in descriptive morphology led anatomy away from physiology and postponed the development of an experimental phase. Then he went on to say that his understanding of Mall's program was a return to a functional or physiological mode of teaching anatomy.

¹ J. Loeb, "On the teaching of anatomy," *Anat Rec.*, 1911, **5**, 306.

From the evidence which has been presented here, it is clear that nearly a century ago the ideas of liberal training for advanced education were formulated by von Baer. These ideas were self-education for the student under skilled guidance, the concentration system to enable him to work from the very start as a professional rather than an amateur, and the significance of research for the advance of medical knowledge. It was Mall who saw that this program could be put into effect. These ideas are similar to those of modern progressive education. Mall had extraordinarily clear vision, indomitable purpose and limitless patience; he could wait years but he never relaxed from a persistent driving force in putting his views into practical operation. He laid far too much stress on the idea that it was the student who should do the work and gave too great an advantage to the abler ones to be a popular teacher. But how great a teacher he was may be judged by the fact that today there is no dearth of able men to fill the departments of anatomy in all of the medical schools of this country; he founded a school of anatomy. Teaching a science which has had the longest descriptive phase of any science in history, he trained a group who readily passed on into the newer experimental phases of the subject.

He was a reformer; he found anatomy in this country not a science at all but merely subservient to the surgeon's art. He made it here a productive science, able to carry on its own work and to influence

other medical branches. He found the teaching of anatomy archaic and made it advanced, and, as Sir Arthur Keith said, his influence changed all the anatomical departments of the country. He was criticized for not bending his energies toward training students to pass State Board Examinations handsomely. He thought that they should master enough to pass them but that it was far more important to train them to contribute to the advance of medical science. He gave students leisure for thought, liberty to follow their own bent, and treated them as mature and responsible scholars. Many of the advantages which medical students now take for granted were won for them by Mall. His claim to be considered a great teacher is that he changed the type of anatomical teaching in every laboratory in the country, that he found it one of the most restricted branches in the medical curriculum, and made it one of the broadest, and that he developed a school of anatomy and influenced the teaching of his subject by his colleagues in other departments as well as through his own pupils.