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THE IOWA ACADEMY OF SCIENCE

D. S. FAIRCHILD

In the early days of Iowa, not pioneer days, or building home days, but after homes had been assured, educational interests began to develop. As early as 1872 our higher institutions of learning, the Iowa State University at Iowa City and the Iowa State College at Ames, had but small facilities and the men teaching different branches, to a degree, confined their work to a specialty. There were no professors teaching natural philosophy, or natural history, which included all animal and vegetable life, as in so many of the old time colleges. In about 1880 or earlier, both the University and the State College had well organized chemical departments and also organized departments of Zoology and Botany. When these departments had become sufficiently developed to feel an individuality and a distinctive field of their own, the professors in these departments began to feel the advantages which would accrue from a co-ordination of these activities. There were always points of contact which could be better understood by coming together for consultation.

Professor C. E. Bessey, who had recently graduated from the Michigan Agricultural College and who had been appointed professor of Botany at the Iowa Agricultural College at Ames in 1871, soon felt the need of association of scientific men. Ames was but a small country village, and the college had really but little to offer. There was no college spirit; the village and the surrounding country were busy in securing homes and the name Agricultural College did not very clearly define the College as an institution of learning, indeed, for many years there was a dispute as to whether the College was or should be an agricultural station, or an educational institution for the benefit of the agricultural classes.

Professor Bessey was a man of great energy and had an ambition to make a real college and if the institution could not be brought to the status of an institution of learning, to avail himself of the first opportunity to secure an appointment in a college with recognized position or with a hope for the future. Not until after 1893, when President Beardshear was fully estab-

lished in office, did the future seem assured. As may be easily appreciated, the spirit of the institution was not apparent while the uncertainty of its true function was in dispute. President Welch had no doubt as to what the college should be, but to the last day of his life, he saw but little to sustain the hope he so fondly entertained. From an intimate relation with both Doctor and Mrs. Welch, we know they never despaired of the future and often predicted what would come to pass and saw in their own minds the fruition of hopes the realization of which we witness today, notwithstanding the most discouraging attitude of the early boards of trustees and the legislature. In a conversation with President Beardshear in 1894, he declared that the time had come when the future policy of the institution should be determined, and the test came when it was proposed that the specific term "Agricultural" should be dropped and the institution should be known as the Iowa State College.

Professor Bessey early made valuable contributions in botany and was much admired by President Gilman of John Hopkin's University, who secured for Professor Bessey, a winter course of lectures at the University of California. The long vacation at Ames at that time was from November to March, which enabled the Professor to secure the winter period for work and study. President Gilman was an inspiration to Professor Bessey, which largely contributed to the preparation of his work on botany, which was adopted in many colleges as a text-book. Professor Bessey had but one thought, and that was botany, and incidently, the training of young men and young women in scientific methods of thinking.

In 1873 I became a member of the College family as College physician, and was intimately associated with all the College activities, and six years later became a member of the faculty. In 1872-73 Professor Bessey lived in the main College building. In his room we had many conversations as to the future of the College and he showed me his laboratory equipment, which consisted of one microscope, a Zentmeyer, and a few homemade slides. It is not strange that the Professor should feel that laboratory work in botany was a long way off. It was two or three years later that he began to think about bringing the men of scientific thought together, thus forming an Iowa Academy of Science. This was in 1876. Professor Bessey had spent some time at Harvard under Dr. Asa Gray and had felt the inspiration of the Harvard atmosphere and the spirit of a great university. He often felt

the dreary and profitless waste of teaching botany to a few students, and was only saved by having at hand some very good material.

It was finally arranged that he would write to a number of science teachers in the University, and I should write to a number of physicians of scientific turn of mind, to meet at Iowa City to form an Academy of Science. We were more successful than we expected. I corresponded with Dr. W. D. Middleton of Davenport, Professor of Physiology at the State University, Iowa City; Dr. Elmer F. Clapp of Iowa City, Professor of Anatomy at the State University; Dr. P. J. Farnsworth of Clinton, Professor of Materia Medica and Therapeutics at the State University and Dr. A. G. Field of Des Moines. Professor Bessey wrote to Professors Hinrichs, Calvin, Macbride and Nutter, and Professor Macomber of Iowa Agricultural College, Ames. All these gentlemen, including myself, met at Iowa City at the date agreed upon, and with a two days' session, organized the Iowa Academy of Science. On our return home, Professors Bessey and Macomber, Dr. Field and myself filed Articles of Incorporation. Other names were added from time to time; meetings were held chiefly at Iowa City, Ames, and Des Moines. Among the later physicians to come in was Dr. C. M. Hobby, Iowa City, Professor of Ophthalmology at the State University.

It may be admitted that most of the contributions were made by the professors of the educational institutions, and in later years a re-organization was effected, consisting chiefly of teachers in the various colleges and schools. Unfortunately the medical members became so absorbed in professional matters that they ceased to remain active workers. The spirit of the organization was Professor Bessey, who never drifted, but was always a leader and often an aggressive leader, as I had reason to know.

In 1879 the Veterinary school in connection with the Agricultural College at Ames was organized. As there was but one veterinarian in Iowa who was in any degree qualified to serve as a teacher, there was no choice, and Professor Stalker became the Veterinarian of the school. The condition of veterinary training was not far advanced; in 1879 there was but small opportunity to secure competent teachers from outside the state, and even Professor Stalker, from present day measurements, would not rank higher than an amateur, but he was a man of unusual resources and could get up a very interesting lecture, even if it had but little relation to veterinary science. He was not the only instance of the

kind in the College faculty. About that time, or a little earlier, (1873) a professor of chemistry was elected, who became for several years, perhaps, the most popular man in the faculty, although he did not know the most elementary principles of chemistry. He did not know, I venture to say, the chemical formula for carbon dioxide, but could get up a most entertaining lecture which had little or no relation to chemistry.

I remember that when the narrow guage railroad from Des Moines reached Ames, there was a public reception on the district fair grounds on the banks of Squaw Creek. Professor Hutchins represented the College and delivered a most eloquent address, which received great applause and filled the minds of the other members of the faculty with envy. Therefore, when the chair of Comparative Pathology, Physiology and Histology was offered to me, I had no hesitation in accepting. Nothing at all was known of bacteriology. In my student days there existed no laboratories in which microscopes were used, but it soon became apparent that some knowledge of the microscope was necessary in the scientific practice of medicine, and the first \$100.00 I could spare was used in the purchase of a microscope.

Professor Bessey very soon became dissatisfied with the one microscope that the College could afford, the Zentmeyer, and found a German maker named Schroerer who had opened a small shop in New York and made a microscope bearing this name. Professor Bessey purchased one of these instruments with a Hartnack objective, and also led me to purchase one of the same make. The only text-book on histology was an English translation of Kolliker. For the first ten years I was my own instructor. It may be said in this connection, that while we were at work on some plan of organizing courses of lectures and demonstrations in comparative pathology. McGill University at Montreal, under the inspiration of Professor Osler, later Sir Wm. Osler, was developing the same work. Professor Osler, without a knowledge of bacteriology, believed there was an important field of work in studying diseases of men in connection with diseases of animals. At that time the only points of contact were in the direction of pathological anatomy and pathological histology. While this relationship had a certain value, the real fundamental facts, remained unknown until bacteriology was worked out. So far as parasites were concerned as related to men and animals, much had been worked out, but later a revision of our knowledge became necessary and even now new facts are constantly being

added from the study of tropical diseases under later methods in the study in tropical countries and in our schools of our tropical medicine through the agencies of certain Foundations and through the encouragement of the United States Government and certain foreign governments having tropical dependencies, particularly Great Britain.

The great revolution in pathology, human and comparative, came with the development of bacteriology. It is difficult to appreciate the vast gains that have come from the study of bacteriology in relation to disease, and, as I think of it now, how futile were our studies of disease and its causes before the work of the bacteriologists came to our aid. I have a long row of books on pathology before the days of the bacteriologist, which I often review with amusement when I think of the years of serious study I gave them and they now stand as mile-stones that mark the long and difficult way we traveled before the student of micro-organism came to show us the true road to exact knowledge, but I do not forget that all is not yet known, and that we still sometimes wander into trails that we are obliged to retrace and start again with a new and perhaps a better guide. All our past was not in fact lost, but served to make us watchful and perhaps more critical in our acceptance of the new way.

In 1879 things began to change. Professor Bessey finally persuaded the Board of Trustees to permit him to import 12 Beck student microscopes. It was indeed difficult to persuade a farmer Board of Trustees that microscopes were necessary to successful farming, but the microscopes came, and he kindly loaned me six of these microscopes for two afternoons a week for classes in histology and pathology. In this way we laid the foundation for a great school which is the admiration of the veterinary profession.

Conditions were no better at the State University. For years instruction in the biological sciences and in medicine was conducted by didactic lectures entirely. No thought was given to looking for men of scientific training; the appropriations were small and both the University and State College found it difficult to secure money enough to live from day to day even in a most economical manner. The farmer population looked with suspicion on the college at Ames and it was accused of drifting from the original intent of its founders; it was not making farmers, and the farmer contended he was not sending his boys or girls to college to be made farmers, but to secure a good education to

fit them for any position in life. If, indeed, they were to be farmers, he could fit them, according to his then conception of farming, better than at Ames. Notwithstanding these untoward influences, the fact that the young men and women who went out from the State Agricultural College brought honor and distinction to themselves and the college at home and the high appreciation abroad, seems a sad commentary on our own state. At commencement time in November, it was a sad period. Many times as we sat on the rostrum, to listen to the exercises, Prof. Stanton, who knew the atmosphere so well, would leave his chair and soon return with tears in his eyes and a sadness in his face, showing that some pending fate was to come to some one or to some plan formulated for the growth and expansion of the college. The public will never know fully the sacrifices made by the early faculty, in credit and financially, working long hours for returns that would scarcely meet ordinary living expenses, \$1,200 to \$1,800 a year for full time. This condition particularly applied at Ames and in the biological and medical departments at Iowa City. It was not strange that men like Professor Bessey should have an open mind for some college appointment where the atmosphere was not of the "hired man" kind.

This will seem strange to you gentlemen who are saturated with the spirit of our great educational institutions and are living in the atmosphere of the State College and the University. But as we think of it, at that time Iowa was a state of farms and small villages, where the struggle to secure a home was severe. You will remember that at the beginning of the Civil War the state voted bonds to the amount of \$800,000 bearing 7% interest, to equip its soldiers, and that less than \$5,000 could be sold outside the state, and that less than \$80,000 could be exchanged for supplies in the state, and that for years fiat money in the form of greenbacks, and later free silver, threatened the economic policy of the state.

There were colleges enough in the state, but none giving what we now term higher education. There was no college spirit beyond the narrow limits of some sectarian school, and that was confined almost entirely to the church influence that was supporting the particular school, and as useful as these colleges were, they did not develop the true college spirit and the student attending them was often obliged to name the town in which his college was located.

Many years ago we listened with great interest to the President

of Grinnell College, who delivered a lecture on college spirit. This term being not easy to define, he referred to Oxford and in a lesser degree to Harvard, illustrating an influence irrespective of any educational value, and so it was in relation to the early organization of the Iowa Academy of Science. It was not thought that any important contribution to science would result from such an organization at that time, but would encourage not only a feeling of co-operation among men of scientific thought, but increase an interest in college activities and scientific training.

Iowa had been thought of chiefly as a land of corn and hogs, offering little or no opportunities for research. It is true that Professor White had made a geographic survey of Iowa which gave an idea of the natural resources of the state, and which would probably lead to other surveys of other kinds largely of local interest.

In the atmosphere of the State College and the State University there was bred none of the spirit of patriotism and state welfare which has become so marked in late years. It is only the men who have lived through several eras of state development who can appreciate the remarkable changes that little more than a generation has wrought. In the days I have referred to, the institutions considered were only schools where boys and girls could secure a good education, but now there is a State College and a University spirit which cannot be measured by any ordinary standard, something pervasive, something that fills the mind and heart of every citizen of Iowa, whether he has been a student or not. It is not the acquirement of knowledge alone. We cannot think of Iowa without having in mind the State University and the State College. It is the occult influence of great institutions which measures the intellectual atmosphere that spreads beyond the boundaries of the state. Let us see to it that what has happened in days past will not happen again if the scientific spirit pervades our state institutions and scientific societies.

We have often been filled with the idea that the function of an institution of learning is to impart knowledge, and in this industrial and materialistic age the knowledge acquired must have the closest relation to production and money getting. The demands for technical courses and technical knowledge is of great importance in industrial development it is true, but to make a nation great we need more, we need accurate, scientific thinking to solve the problems that lie before us. We contemplate with

wonder and astonishment the great accomplishments of recent years in developing the natural resources of the world and of bringing to every household the comforts of life with so little labor and hardship, and we legitimately attribute these to the development of technical knowledge, and we cannot see the end. But with all these at hand and the smooth working of evolutionary processes, we find ourselves utterly lost when we come to measure the great problems of human relationship.

In 1914 came a great crisis in human affairs, which, with all our technical knowledge, we could not interpret, and now after nearly ten years, we are far from being able to determine what is the proper course and what is our duty. There are, it is true, a considerable number of clear thinkers who seem to point out a clear and safe course, men of broad vision, whose training fits them to understand great human problems and to determine the remedy, but the education and the methods of thinking of the great majority are in lines of technical knowledge, who calculate personal, state and national advantages, but the human element appear to be beyond our reach.

If I may revert for a moment to my own profession. The technical knowledge of the medical profession is wonderfully great. But the great thinkers are few, and many of this class have subordinated technical knowledge to great problems of human interest. Hippocrates was a great thinker; not by his extraordinary skill as a physician did he dominate medicine for more than a thousand years, but through a system of philosophy, reducing medical practice to simple terms. Sydenham, a great English thinker, who knew little of medicine as practiced today, relieved medicine as did Hippocrates, of a multitude of non-essentials. We pass to John and William Hunter, a hundred years later, who revised the methods of Sydenham and placed medicine on the beginning of a scientific foundation. The medical thought then abandoned England and reappeared in France in the person of Bichat, followed by Louis, and Laennec. Then to Germany under the leadership of Virchow, the great pathologist. Then back to France in the person of Pasteur, who, though a chemist, laid the foundation of bacteriology, not at first through technical experimentation, but by logical reasoning. Then to Lister in antiseptic surgery, based on the logic of Pasteur. The names of great medical thinkers are few, yet important contributions were made by many.

We may mention great thinkers who did not create an era in

medicine, but by processes of logical thinking, did much for humanity. Dr. Oliver Wendell Holmes in America; Semmelweis in Austria in puerperal fever; the Monk, Gregor Mendel of Brunn; Galton and Karl Pearson in biometrics and social phenomena, and Sir. Wm. Osler and W. H. Welch of John Hopkins.

Very few of these names are familiar to the general student, even in medicine, but they were real thinkers who laid the foundation for great movements in the interests of humanity. We are not declaring against technical knowledge or skill, but are endeavoring to present an argument in support of a broader conception in education and higher process of reasoning that will better fit the race to meet the great questions of human welfare.