formerly called *Piroplasma,* which are the cause of Texas fever or red-water fever, malignant jaundice, East Coast fever, and biliary fever amongst domestic animals. We know, again, little that is certain concerning this group, except that they are unpigmented parasites of the red corpuscles, and are carried by ticks. They are the most destructive to the blood of any we know. In an ox, I have seen the red corpuscles decrease from 8,000,000—the normal—to 56,000 per cubic millimeter in two days.

Another important group, the *Leishmania,* is still uncertain of its exact position. In the body they occur as small bodies with a nucleus and micro-nucleus, but when cultivated on artificial media they become flagellated organisms of a herpetotomas type. It is not quite certain what insect plays the part of carrier, but the different varieties of this group cause the diseases known as Kala Azar or tropical splenomegaly, Oriental sore, Delhi boil, Biskra boil, etc., and also infantile splenic anemia.

The last class are the Hæmogregarines. These are parasites of the red corpuscles of reptiles principally, but they have been described in mammals and birds. We only know certain stages of the greater part of them; they are large, sausage-shaped bodies, not pigmented, and they are supposed to be carried by leeches, ticks, lice and fleas. They generally have a capsule. In some instances the host-cell is enormously enlarged and entirely dehemoglobinized, but in most cases the host-cell is not enlarged.

I have now taken you over some examples of all the known types of blood-parasites, but, at best, the picture in your minds must be like that of a landscape taken from a railway carriage at full speed; and the result, I fear, only a kind of clarified confusion, but it will be something if I have succeeded in making it transparent at the edges. What must have struck you most is the smallness of our exact knowledge of many of these extraordinary organisms and the gaps that there are even in this. But the incitement to future work lies in this fact, for

Things won are done, joy's soul lies in the doing.

Henry George Plummer

SOME EDUCATIONAL PROBLEMS IN KANSAS[1]

Kansas partakes of the general educational life of our country and confronts in a large measure the problems presented in all other parts of the United States. Much criticism has been directed against public schools, whether common schools, high schools or colleges and universities. Part of this criticism has been constructive in its aim and founded upon a conscientious loyal purpose. Some of its has been destructive, without adequate basis, and founded upon ignorance or unworthy motives. The conditions that subject the schools to reasonable criticism have been found after investigation to be due not so much to the schools or institutions themselves as to the character of our community life quite beyond the sole control of schools and colleges. This has been true of Kansas and of its institutions of higher education; and the most searching criticism has shown them to be on the whole sound, economical in their management, praiseworthy in their motives and purposes. That there has been waste in education of all degrees there is no doubt, but if we set up the rule that those agencies of life that present waste must be abolished or their fundamental organization and purpose changed, then all the agencies of life must be abolished or their fundamental purpose and organization

[1] Semi-centennial of Kansas State Agricultural College, October 29, 1913.

changed for there is no perfection in any human agency and all are subject to the charge of waste. I believe that the charge of waste, so far as money waste is concerned, has less foundation in connection with education than in connection with most other agencies of our American life. This I believe to be true of Kansas also. Waste in education does not necessarily arise through a large expenditure of money. It arises much more from the lack of large expenditures of money, for all those who are acquainted with the great problems of education will probably agree that there is no waste so great, no extravagance so unjustifiable as a false economy in education and there is no use of funds so truly economical, so immensely efficient as an expenditure of public funds upon education as large as the demands of our time and the outlook for the future makes necessary. Therefore, as I view it, the problem with us is not the reduction in the expenditures by the state for education but a large increase in the expenditures of the state, and a most careful and efficient administration of those expenditures on the basis of the most expert and experienced advice that our most expert and experienced administrators can give.

2. That there has been a change in the general purpose of education there can be little doubt. This was inevitable in connection with the movement toward the democratization of American life. It is another aspect of the movement, whether we like it or not, to achieve a real democracy in the United States. To accomplish this without the aid of the schools would be most difficult for the schools are the main agency by which the achievements of the past are handed down to succeeding generations and by which fundamental changes in the general operations of our life must be maintained. If the purpose of education remained the same, if the intellectual discipline of our schools remained absolutely rigid, progress would be almost if not quite impossible. Every decade brings its new discoveries. All of these accretions must be added to what we are to hand down to the rising generation. The modern public high school, the modern public university, bringing as they do within their sphere of influence a vast throng of boys and girls from every walk of life had to be adjusted to the needs of this heterogeneous mass and the institutions that were originally planned for the development of a profession or for a few callings in life or for the more fortunate classes in our country have been obliged to adapt themselves to the new aspect of our national life. No change so great as this may ever go on without its accompanying dangers. This change has been so rapid and so revolutionary as to make permanent adjustment difficult. The danger here lies in the possibility that the basis of education may become the purpose solely or largely to train for the ability to accumulate wealth. In other words it may become materialistic. Whatever defects the old training had it was free from materialism. Therefore, as I view it, the problem in Kansas is by far-sighted wisdom to secure such permanent adjustment as shall make our institutions of learning hospitable to all the permanent shiftings of our community life and at the same time to avoid a materialistic purpose and basis of education.

3. Vocational education has been a necessary outcome of the general industrial development in our American life, and of the change in the purpose of our education. In 1889–90 there were only 203,000 pupils in the public high schools in America. There were in 1911–12, 1,105,000. In 1889–1890 there were in colleges, universities

and schools of technology, 66,000. In 1912 there were 198,000. That this great multitude of boys and girls crowding into our colleges and universities should not be shunted off from the trades and industries, from a contact with and a knowledge of hand labor, that they should be able to earn a competent living, vocational training was inevitable. In this connection there are at least two things that ought by all means to be considered. In the first place any arrangement of American education that shall lead to stratification of our population by which one class is turned perforce in one direction and another in another would be a national calamity. No such stratification as has occurred in Germany could be tolerated in America. No teacher or administrator must ever have the authority to say to one boy that he may go on into the high school and prepare for college and issue with all that the college or university can give him, and to another boy that he must go into a trade school and issue as a hand laborer. There must be absolute freedom for the choice of the individual and the road must be open from the kindergarten to the university for every boy or girl that has any aspirations for the highest training. Then again, if we are to have vocational training and if we are to deal with this great multitude in an adequate fashion, vocational guidance must go with vocational training. There must be adequate supervision, adequate suggestion and guidance by which boys and girls may be made acquainted with the different trades, industries and professions; given some adequate insight into the purposes and requirements of each so that they may have not coercion but assistance in arriving at the task in life that each desires to perform. I hope to see in the university over which I preside the development of competent agencies for investigation into the individual aptitude of students and the introduction of courses and other means for vocational guidance and information concerning trades, industries, professions and business callings.

4. There is no aspect of our education whether in the United States or in our own state that is more disheartening or that raises more questions of doubt than the adequate supply and the adequate quality of teachers for our schools of every grade. To overcome this, undoubtedly two things are absolutely necessary. First, the independence of the teacher, permanency of tenure, the respect that is due to a great and dignified calling. No class of men or women of any spirit or ability will enter a profession, or having entered long remain in it, if their independence, their right of initiative and free speech as American citizens is in any way in question. Nor will they enter a profession or long remain in it if their tenure of office is lacking in permanency or subject to any uncertainty arising from the exigencies of politics or too frequent changes in administrative policy. Unless these evils are remedied I fear, from many evidences during the last few years, that we must look for a decrease rather than an increase in the number and quality of our teachers.

But perhaps the most vital consideration in this respect is the condition of teachers' salaries. I refer here to the salaries in all grades of schools, including colleges and universities. The salaries in our colleges and universities are, so far as relation to purchasing power and living conditions is concerned, lower I believe than they have ever been in the history of the institutions. The report of the commissioner of education for 1912, page 29, has a section dealing with this point. It gives a summary of the report of a committee of the National Education Association on

teachers' salaries and the high cost of living. Taking it as the basis of authority we may note that

> The United States Bureau of Labor found that in 1911 wholesale prices were 44.1 per cent. higher than in 1897. Measured by wholesale prices a teacher whose salary had remained fixed at $1,000 since 1897 would have no greater purchasing power in 1911 than $693 possessed in the earlier year.
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> The increase of wholesale prices has, of course, been reflected to a greater or less degree in retail prices generally. . . . In June, 1912, retail food prices were 61.7 per cent. higher than the average for 1896.

In any college or university, therefore, where the salaries of professors have remained at from $2,000 to $2,500 the teacher has found a tremendous decrease in the actual value of what he received. The result has been, as the Carnegie Foundation reports so ably show, a drawing off from the teaching profession on the part of many able men and women who for the good of our education ought to have remained. A further continuance of this condition will draw off a still greater number and make it more and more difficult to persuade men especially to enter the teaching profession.

5. One of the great problems confronting education in Kansas as elsewhere is still the moral and religious problem. If any were misled years ago into the belief that intellectual training provided sufficient safeguards and moral standards, certainly our experience in the last decade must have disillusioned him. There is nothing so futile as the attempt to make intellectual training take the place of moral and religious training and no man is so dangerous as the educated man gone wrong. In my judgment the grave point of danger in our schools is not the college or university. Long experience leads to this conclusion and statistics and general observation point inevitably to the same conclusion. The grave point of danger is the home and high school and here must the great work be done, for after all ours with all its defects is a Christian civilization. Historical Christianity is the basis of our whole life and we, as a nation, shall stand or fall with it.

6. One of the problems confronting all states having several institutions of higher education is their proper correlation. The demand for such correlation in Kansas has come about to some extent from the belief that large duplication exists which might easily be eliminated by an arbitrary decree fixing the field of each institution. It has been thought by some that it would be feasible to define precise and narrow limits for the institutions and to confine them strictly within such limits. As soon as one considers this problem carefully with a full understanding of practical conditions it becomes evident that such a narrow delimitation is impossible and if it should be undertaken upon any precise theory it might result in disastrous dismemberment of our institutions and great harm to our education. No one, so far as I know, would undertake to defend duplication which is artificial and gratuitous, which has no substantial basis and is not a necessary concomitant of the genius of the institution itself. But every institution must round out its life and do what necessarily arises in its field of operation.

The demand for correlation has arisen in the second place from a belief that large duplication exists, necessarily giving rise to an unusual and useless cost of education. The total cost of higher education in Kansas is large and at this point it is commonly assumed that the cost per institution and per student must be excessive and that duplication must be the cause of it. This belief is unwarranted. Now, there

is one infallible test of whether or not education in our Agricultural College or University is costing too much and that is a comparison of our per capita cost with that of other like institutions in other states, for taking a long series of years together there is no standard of the necessary cost of education so accurate as the average cost in institutions of practically the same grade. Indeed it would be impossible for any considerable duplication of effort to exist in Kansas without largely increasing the cost per student. To show that the cost per institution and per student in Kansas is not large one has only to compare the average cost of other institutions and their cost per student with our own. Such a comparison will show in practically every case that without question the cost of education in the Kansas Agricultural College and the University of Kansas, both as to the institutions themselves and as to their cost per capita, is below the average of other institutions of like rank. The large cost of education in Kansas arises rather from the unprecedented number of young people that Kansas undertakes to educate. There were students, residents of Kansas, in the University and Agricultural College in 1911–12, to the number of 4,594. If Iowa had educated as many according to population as Kansas, instead of 4,163 resident students in its University and Agricultural College it would have had 6,317; Wisconsin, instead of having 3,945 would have had 6,341; Indiana, instead of 3,889 would have had 7,339; Michigan instead of 4,509 would have had 7,636; Missouri instead of 2,740 would have had 8,949, and Illinois instead of 3,504 would have had 15,322. The question that arises, therefore, is not excessive cost per student but shall Kansas continue to educate its young people in unusual and ever increasing numbers and pay the necessary cost? I believe that most of us would answer most emphatically in the affirmative.

The question of coordination of institutions suggests another danger that might arise through an attempt to standardize institutions within a given state and make them uniform in their purpose, their spirit and their outlook. I believe that nothing worse could happen in Kansas education. The value of our institutions lies largely in their being different, in having different problems to solve, in having a different life, a different point of view. A college or a university has a soul as has a man and the personality of an institution and the integrity of its life at all hazards must be maintained. It must be held to its primary purpose and acquit itself valiantly in its own domain. It seems to me, therefore, that the watchword in Kansas must be cooperation; that the teaching bodies of each institution must have and exercise powers of initiative and internal control in order to visualize and develop their own problems and maintain their own integrity and independence; that at the same time they must cooperate most fully with the board of administration and every other proper agency of education in their every endeavor to secure a true and fundamental cooperation to the end that our education, while as diverse as the different agencies connected with it, shall after all have a true and noble unity.

Frank Strong,
Chancellor
University of Kansas

The American Society of Naturalists

The American Society of Naturalists in affiliation with the American Society of Zoologists, the American Association of Anatomists, and the Federation of American Societies for Experimental Biology, will hold its thirty-first