

the object-lesson State for the whole United States. He did not reckon when he said it, that even before his earthly body was cold in the grave, the realization of this ambition, which breathed of the love he felt for South Carolinians, and the gratitude he felt for the love and fidelity that they had manifested to him, would be practically at hand. It is seldom that it is given to any man to do the work in the world that writes his name upon the pages of history after he has passed the age when the vast majority of men and women have laid aside business and wordly cares and have retired to inactive life in contemplation of the Great Beyond. Yet Dr. Knapp, even to the last week of his life, possessed a mind that was as bright, as logical, as clear, as fair and as analytical as at any time in his entire career. To sit with him and hear him talk was only to marvel at the rich nuggets of wisdom which fell in rapid succession from his lips.

This man was a big man. There was nothing mean in his nature. He was a nobleman, born such, not made. He combined rare wisdom and intelligence with a pure soul. He was just and fair-minded. He loved humanity for humanity's sake. When he had to find fault with a subordinate he did it gently, but firmly, and then signed himself, "Faithfully, your friend." He was tactful and diplomatic, and if any mortal was ever given the power of looking into the future, he possessed that power. He was my friend and I loved him. Everybody who ever knew him loved him. I actually loved to steal from his wondrous storehouse of knowledge, wisdom and experience. I would to Heaven that this Nation had more men of his calibre and of his character. His work for the South will live and gather strength in the years to come. He has pointed the people to the gateway to "get there," industrially, morally and socially. Though he is dead his great work for the South, for the Nation, is not done nor will it be done in the days of this generation. He knew science and he knew literature, and he was the one

man that I have ever known, fully equipped in those regards, who could turn in an instant and carry scientific truths to the masses in such a simple, practical way that the masses could take those truths and apply them to their everlasting benefit. He felt that science that could not make some one's burden lighter was not worthy of the name. With him, from science for learning's sake it came to be science for humanity's sake. No wonder our people looked up to him in his majesty of wisdom, his loftiness of thought and fixity of purpose and almost idealized him. He was, as some one has called him "the missionary bishop of the gospel of agriculture to all the Southern people." The secret of his missionary work, perhaps, was due to his remarkable knowledge of men. He knew men from the poorest day laborer to the man with millions, and he knew how to reach each. He knew boys; he knew how to reach them, how to feel with them. He knew how to capture the youthful enthusiasm of the South, and utilize it, making it the means of bringing about one of the speediest and most amazing developments any country ever witnessed. He understood the cares of the farm housewife, and she, in her home today, feels the results of the potentiality of his well directed efforts in her behalf.

But why should I write more? I deemed it a privilege to be able to bow my head beside his bier in Washington, and listen to the inspiring eloquence with which his lifelong friends, James Wilson and Walter Page, paid tribute to his mighty accomplishments, and, as I did so, I felt like adopting, with profound respect, the words of Sir Thomas Moore in eulogy of Hume:

"How shall we rank thee upon Glory's page?
Thou more than soldier and not less than sage!"

UNIVERSITY OF SOUTH CAROLINA FOUNDERS' DAY, 1911

The celebration of Founders' Day, in the month of January of each year by the University of South Carolina, is intended to commemorate the wisdom and patriotism of the forefathers who founded this institution, in order (in the words of Governor Drayton) "to advance the political union" of the people, and "as a rallying point of union, friendship and learning for the youth from all parts of the State." The zealous efforts of Governor Drayton, seconded by his compatriots, especially DeSaussure and Hamilton, resulting in the founding of the College by Act of Legislature in 1801, its earliest organization with a president and one professor in 1804, and its opening for the reception of students in January, 1805, are well recorded in the masterly address of Professor Yates Snowden in commemoration of Governor John Drayton on Founders' Day, 1910, and need not be recounted here. In January, 1905, the centennial of the College was celebrated with appropriate and impressive exercises, which aroused a wide interest. The next year, by Act of the Legislature, the old College was chartered as the University of South Carolina, and, with the precious heritage of its past history, the institution entered upon a new era of progress and expansion. The gratifying growth of the University since that time, and the increasing development, under its influence and co-operation, of both elementary and high school education in the State, add fresh emphasis to our obligations to these patriotic founders, and give assurance that Founders' Day will hereafter be more and more gratefully observed in the history of the University.

For the year 1911, Thursday, January 12th, was selected for the Founders' Day celebration. The weather was delightful—a circumstance which added greatly to the success of the exercises and the pleasure of the occasion.

MEETING OF ALUMNI.

At noon an enthusiastic meeting of alumni was held in the auditorium of the new Science Hall. Gratifying reports were received from many quarters and the annual officers were elected. On motion of Dr. Joynes it was resolved to undertake the organization of local alumni clubs, and the executive committee was instructed, in co-operation with Dr. Joynes, to take steps to this effect.

FLINN MEMORIAL HALL.

At 3 o'clock the invited guests, the alumni and visitors assembled at Flinn Memorial Hall. This large and handsome building has been named in honor of the late Professor J. William Flinn, who began the collection of a fund for the Young Men's Christian Association of the University, to which the building is now specially dedicated. It is also the home of many other student functions, and is a favorite and attractive resort of the students during times of leisure or recreation. It is handsomely furnished and is provided with an attractive library, magazines and local newspapers, and forms a most agreeable and helpful element of student life in the University. During the past year it has been under the superintendence of Mr. W. P. Mills an A. M. of the University, and a Rhodes scholar of Oxford, whose influence has been most happy and helpful. Flinn Hall is now universally recognized as one of the most valuable additions to the University.

THE PROCESSION.

Under the skillful generalship of Professor Baker, the large company marched in procession around the campus, past the new Science Hall and into the University Chapel, where the exercises of the afternoon were held.

THE SCIENCE HALL—LECONTE COLLEGE.

The new Science Hall, named LeConte College in honor of the famous LeConte brothers, once professors in this University, was this day formally opened and dedicated. The build-

ing is a modern structure, furnishing accommodation for the departments of science, as Davis College does for the literary departments, including Chemistry, Physics, Biology (including Bacteriology), Geology and Mineralogy, Philosophy and the State Board of Health, with ample class rooms and laboratories. It is needless to say that this building adds greatly to the facilities for instruction and investigation. Along with the Davis College, the LeConte College marks an epoch in the development of the University.

ADDITIONAL EXERCISES.

Lieut.-Gov. McLeod; Professor Tate.

When the great throng had crowded into the University Chapel the exercises were continued according to the program, which is hereafter printed in full. Lieutenant-Governor McLeod presided with his accustomed dignity and grace. After an earnest invocation by Rev. Dr. W. C. Lindsay, the venerable pastor emeritus of the First Baptist Church, Lieutenant-Governor McLeod, with a few happy words of congratulation to the University, introduced Professor W. K. Tate, who delivered an address on "The Enrichment of Rural Life in South Carolina." (This address is printed in full hereafter.)

DR. KNAPP.

In introducing Dr. Seaman A. Knapp, Lieutenant-Governor McLeod said: "For many years no one has doubted that South Carolina could raise more 'Cain' than any other State. In a year or two it can be truthfully said that South Carolina raises as much corn as any other State. For this change in South Carolina's crop Dr. Seaman A. Knapp, of the Farmers' Co-operative Demonstration Work, who will now speak on 'The Application of Science to Agriculture and Industries,' is largely responsible."

Dr. Knapp was accorded an ovation when he arose to speak. During his masterly address he was frequently interrupted with bursts of applause. Dr. Knapp's address is printed in full elsewhere.

THE RECEPTION.

At the conclusion of Dr. Knapp's address the audience adjourned to the beautiful new gymnasium, where an informal reception was held by President and Mrs. Mitchell, the gentlemen and ladies of the faculty and the invited guests. Light refreshments were served by graceful young girls, and a delightful hour was spent in cheerful talk and in making and renewing acquaintanceships. A cheerful note of congratulation upon the condition and prospects of the University increased the enjoyment of this social hour.

EVENING AT THE STATE HOUSE.

Governor Ansel Presiding.

The exercises of the evening were held in the Hall of Representatives in the capitol. Governor Ansel, whose whole administration had been marked by cordial friendship for the University and by interest in education, presided and introduced the ceremonies in a few appropriate words.

PROFESSOR W. H. HAND.

The first speaker was Professor W. H. Hand, State Inspector of High Schools and Professor of Secondary Education in the University, whose speech on "The Purposes of the Founders" is given in full elsewhere.

DR. WALTER H. PAGE.

The next speaker, and the chief guest of the University, was Dr. Walter H. Page, editor of the *World's Work*, New York, a distinguished son of North Carolina, who spoke most impressively on "A Layman's Notion of a University." This address is given in full hereafter.

THE McMASTER MEDAL.

The McMaster Medal, founded by Fitz Hugh McMaster, Esq., an alumnus of the University, to be presented annually to that alumnus who shall be adjudged by the faculty to have ren-

dered the "most distinguished service to mankind," was this year awarded to Dr. Walker Gill Wylie, of New York. To make the presentation the faculty had selected

DR. ROBERT WILSON, JR.,

an alumnus of the University, now Dean of the State Medical College of South Carolina.

Dr. Wilson said:

"It is of no little significance that Dr. Walker Gill Wylie has been selected by the faculty of his alma mater as most worthy to receive the McMaster medal, conferred annually upon some alumnus of this institution on account of his distinguished service to mankind. The profession of which he is an honored member is one whose most cherished watchword is service. I like to think that every true member of this ancient profession is entitled, by divine right, to wear as his own that famous motto which was the trophy worn by the Black Prince upon the field of Crecy—that motto which was borne by the old king, who, reckless of life, and blind to everything save duty and honor, charged with his knights where the fray was thickest. The humble physician who goes in and out among his people, ministering to their sufferings and healing their wounds; the skillful specialist, who, by intensive cultivation of a limited field, achieves such marvelous results; the quiet laboratory student, who willingly sacrifices material gain, and oftentimes life itself, in the quest of new truths of science which will enable men to prevent disease and save lives; the patient teacher who strives to impart to others the knowledge of his art and to kindle in the souls of his pupils the Promethean fire of noble ambition, and to inspire their minds with exalted ideals of sacrifice and work; each wears upon his crest those princely words, *Ich Dien*.

GAVE HEALTH.

"In giving back health and life to suffering women, Dr. Wylie has sent the blessing of peace and joy into a thousand homes—nay, more, in warring with the evils that sin against the strength and beauty of motherhood, he has rendered a

service of more far-reaching significance than mere words can express. The mothers of our sons are the bulwarks of the nation. It is upon them and upon the homes they make that we found our hope of safeguarding the structure of national and social life against the corroding influences of 'the narrowing lust of gold' and debasing licentiousness.

"Dr. Wylie's contributions to the technical details of his special field of surgery have been most valuable, and have added largely to the great success of operative procedures; but these I only mention in passing on to refer to the one achievement of surpassing beneficence which appears to me to stand out pre-eminent as I turn the pages of his past career.

REVOLUTIONIZING HOSPITALS.

"While he was still an interne in Bellevue Hospital, the death of a little patient, who, after a serious operation, had been attended by a nurse doubly incompetent because intoxicated, suggested to his mind the pressing need of reform. After a conference with certain benevolent ladies, he visited Europe at his own expense to study the system of nursing instituted by Florence Nightingale; and upon his return, bringing with him a nurse trained under that famous woman, he organized the Bellevue Hospital Training School for Nurses, the first institution of the kind in the United States. Since that time training schools have become an essential part of almost every hospital of considerable size in the land, and the nurses graduated from them are now indispensable aids to the physician, increasing enormously the efficiency of his service, oftentimes, indeed, determining by their skill the successful outcome of his efforts, and, by their sweet presence and loving tenderness, serving to dispel many of the terrors of illness. Had Dr. Wylie accomplished nothing else than the institution of this system in our country, he would have earned the undying gratitude of all men.

ANOTHER SERVICE.

"Another service which Dr. Wylie has rendered, while less important, I believe, than his professional work, has been nevertheless of signal benefit to your State. I allude to the organi-

zation of the Southern Power Company, which has contributed so largely to the development of certain sections of our commonwealth. Following in the train of this enterprise new territory has been opened, new towns have sprung into existence, new railroads have been constructed and new mills have been established, all of which are civilizing agencies of very considerable importance.

"It gives me great pleasure, in behalf of the faculty of our beloved alma mater, to bestow upon you, Dr. Taylor, for Dr. Wylie, this medal. May it be a source of continual gratification, reminding him day by day that his labor has not been in vain. And may his children, and his children's children, cherish it as a precious memorial of the noblest heritage he can leave them—the record of a life spent in the service of his kind."

DR. JULIUS H. TAYLOR,

in behalf of Dr. Wylie, who was detained by sickness, made a brief and happy response. He said that Dr. Wylie had requested him to say, in returning thanks for this great honor, that he felt that he owed all his success in life to the instruction and inspiration received at South Carolina College, whose praise he prized above all other distinctions. Dr. Wylie's absence was much regretted.

SMOKER AT FLINN HALL.

The proceedings of this delightful day were concluded by an informal alumni smoker at Flinn Hall, at which all the boys, old and young, forgot "dull care" and extended their happy reunion into the "wee small hours."

As a memorial of the day, a copy of the program is added:

FOUNDERS' DAY

UNIVERSITY OF SOUTH CAROLINA.
One Hundred and Sixth Anniversary.
Thursday, January 12, 1911.

AFTERNOON.

Formal opening of Science Hall.

3:15—The academic procession forms at Flinn Hall.

3:30—Exercises in the University Chapel, Lieut.-Gov. Thos. G. McLeod presiding.

Invocation by Rev. W. C. Lindsay, D. D.

ADDRESSES.

"The Enrichment of Rural Life in South Carolina"—Prof. William K. Tate, State Supervisor Elementary Rural Schools.

"Application of Science to Agriculture and Industries"—Seaman A. Knapp, LL. D., Director of Farmers' Co-operative Demonstration Work, Washington, D. C.

5:00—Reception to the public in the Gymnasium.

EVENING.

8:00—Founders' Day exercises at the State House, Gov. M. F. Ansel presiding.

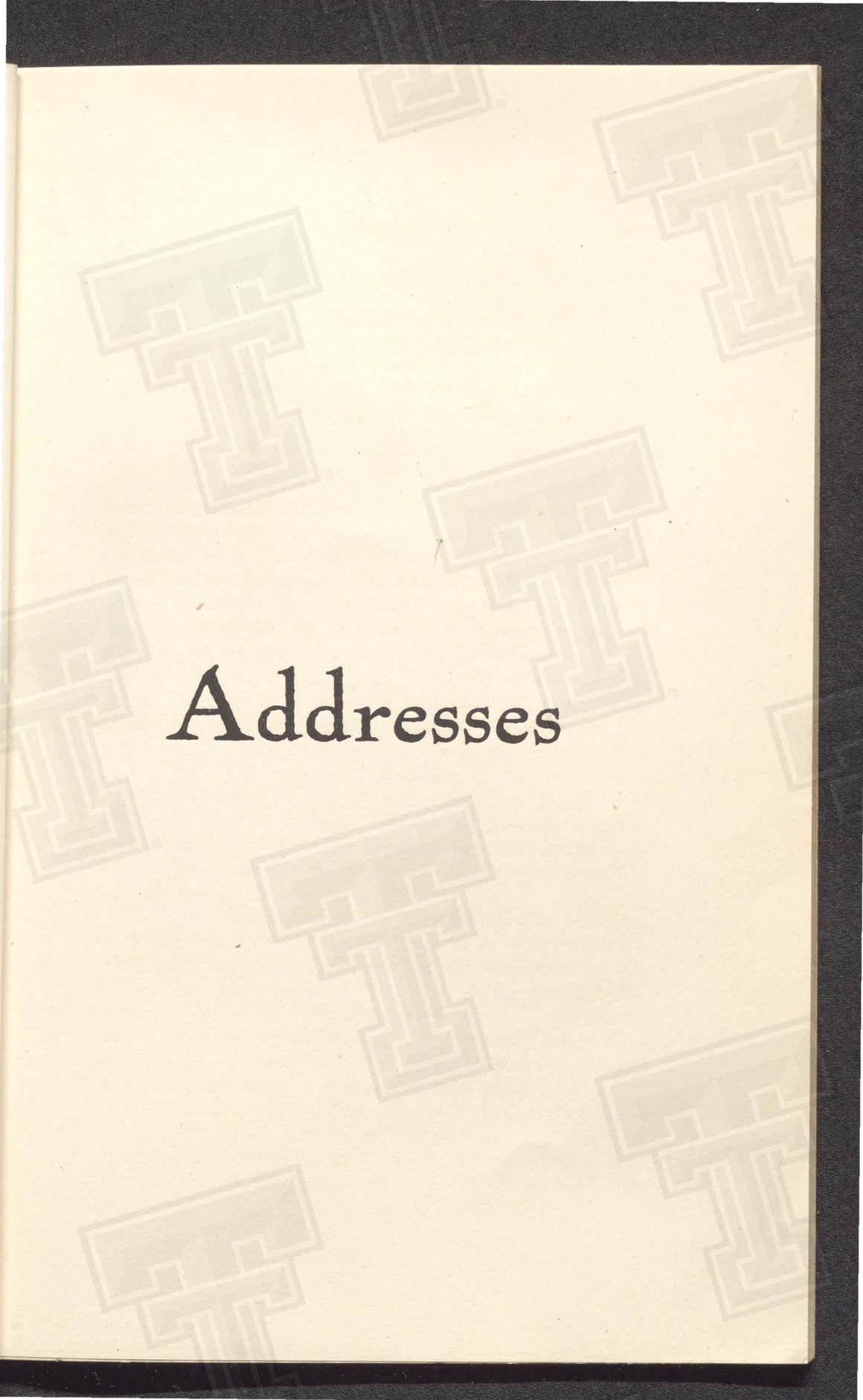
ADDRESSES.

"The Purposes of the Founders"—Prof. William H. Hand, State Inspector of High Schools.

"A Layman's Notion of a University"—Walter H. Page, Ph. D., Editor of *World's Work*, New York.

Presentation of the McMaster Medal by Robert Wilson, Jr., M. D., Dean of the State Medical College of South Carolina, Charleston.

Response for Walker Gill Wylie, M. D., New York, by Dr. Julius H. Taylor.



Addresses

ADDRESSES

THE ENRICHMENT OF RURAL LIFE IN SOUTH CAROLINA

Address by PROFESSOR W. K. TATE.

It was recently my privilege to hear from a Japanese scholar a lecture entitled "The Soul of Japan." From this lecture I realized as never before one secret of Japanese patriotism. To the citizen of this Land of the Rising Sun his native country is not merely an aggregation of seas and lakes and rivers, of valleys and mountains and plains, of busy cities and flowering gardens and fertile fields, it is not merely the energetic race of men and women who have startled the world by their brilliant achievements in peace and war. To him in his oriental pantheism Japan is a great personality with a living, growing soul, which has existed since the beginning of the national life and which watches with tender solicitude over the fortunes of the race. Every man and every generation of men constitute a partial incarnation of this soul, and after death the spirits of the heroes enriched by their achievements are again absorbed into the soul of Japan. The dynamic element of this worship of the race is the fact that it unifies past, present and future into one conception of national solidarity.

While the Western nations do not personify this sentiment, it nevertheless exists in the mind and heart of every patriot. The South Carolinian, with his intense admiration for the history and traditions of his State, can easily appreciate the feelings with which Admiral Togo before the battle of the Sea of Japan invoked the spirits of his ancestors for strength and wisdom, and fired the courage of his soldiers by an appeal to future generations as witnesses of their valor.

The State of South Carolina, as it exists today, is the harvest of the past and the seed of the future. Any wise plan for enriching the present life of the people must continually bear in mind the coming generations of South Carolinians. The

individual is normally selfish and short-sighted, and is prone to barter for the present gain the highest welfare of the future. The wealth of the State consists in the natural resources with which it has been blessed by the Creator and the people who develop and enjoy these resources. The supreme duty of the collective mind which we call the State is to safeguard with wise statesmanship these resources and to transmit unimpaired to posterity the opportunity for their highest development.

Before discussing the minor privileges, comforts and conveniences which go to enrich the present rural life of South Carolina, we should first make sure that the foundation for permanent prosperity and happiness is laid in sound economic principles.

STATE CONTROL OF WATER POWER.

Let us make this principle concrete for South Carolina. We speak with commendable pride of the great development of water power in our State. We boast that South Carolina leads the world in the long distance transmission of electric power and in its utilization in manufacturing enterprises. This development has brought prosperity to many people and wealth to many sections of our State. Before pronouncing a final verdict on this matter, however, it would be wise to inquire whether or not these abounding resources of South Carolina have been safe-guarded, so that they may be forever an asset of the whole people of the State.

In the very beginning of American jurisprudence John Marshall, Chief Justice of the United States, established the doctrine that the navigable stream is the property of the nation. Its control may not be determined by the man who happens to own the contiguous territory. In those days the wildest fancy had not imagined the possibility of transmitting power for long distances and thereby making the running streams of the State turn the wheels of manufacturing enterprises hundreds of miles away.

It is difficult for the forms of law to keep pace with the march of science. There is no more reason why the power streams of South Carolina should be considered the private property of the man who happens to own the banks than that

the navigable waters should be appropriated in a like manner. The free sunlight of heaven has lifted these waters from their ocean beds and the untrammelled winds have scattered them equally over the mountain heights. They belong to the people of the whole State. To give to any man unconditional private ownership because the course of the stream touches his land is to give him property rights over the sunshine and the air.

A million years ago this same sunshine beat down upon an atmosphere heavily laden with carbon dioxide, and in the plant laboratories of the carboniferous period, was transmuted into coal and oil and hidden away in the depths of the earth for the children of a later and more favored day. The room in which we are sitting is thus warmed by the sunlight of a far off time before the remotest ancestor of man had yet appeared on the earth. Transformed into electricity, that coal illumines our homes and we look into each other's faces by the sunlight of a million years ago.

This light and heat power, the gift of former geological periods to the whole nation, we have given away with prodigal hand and have wasted without thought of the morrow. The stored sunshine of the past ages will some time be exhausted, but happily we have learned to harness the water power, to transmute it into electric current, to send it far from the banks of the stream and with it to turn the wheels of industry. Science has spanned a million years and is using the sunshine of last week on the Atlantic Ocean to do the work of today in South Carolina. This sunshine belongs to all of us and not merely to the corporation which happens to own the river bank where flows the stream to which it gives its energy. With the exhaustion of the coal and wood supply, this transmuted sunshine will sooner or later be our chief source of light and heat and power. It will turn the machinery of the whole State, and without it the hands of industry will be powerless. Within twenty years the power companies of South Carolina will be able to force a cotton mill merger which will include every spindle in the State. Through the electric current generated by this water power we are learning to transform the nitrogen of the atmosphere into fertilizers for our fields. With the

exhaustion of our natural phosphate beds the importance of this discovery cannot be overestimated.

The corporation which owns the water power of South Carolina may own the State when it is ready to foreclose the mortgage. The sunshine and the winds are tireless servants, the rainfall is the Aladdin's lamp which performs its bidding.

We naturally wish to see this wonderful resource utilized. It may be developed by private capital and initiative. The State, however, should plant firmly in its fundamental law the principle that this resource belongs to all the people of South Carolina, that the man or corporation which develops it is merely a trustee for the rightful owners, and should be so easily subject to the control of the State that our natural wealth may never become an engine of oppression, a cause of revolution, or an excuse for the demagogue.

It is better for a city to wait ten years for a street railway system than to give away its streets in perpetual franchise. It is better for some water power of the State to remain for a time undeveloped than to sell for a mess of pottage the birth-right of the unborn generations.

THE DISTRIBUTION OF LAND.

The second great economic question which lies at the very basis of any discussion of rural life is the ownership of the land. The English race has taught the world by example many great lessons in government. The mother country is now showing the nations in a practical way how *not* to handle the land question. The large landed estate, a universal tenantry, and the degeneration of rural life is the momentous problem which England now faces in a life and death struggle. In Germany 87 per cent. of the people own the land which they cultivate. In the long run supremacy in peace or war will come to the nation where the masses own the land and live upon it. It is hard to separate patriotism far from the ownership of the soil.

I am thoroughly convinced that the permanent well-being of South Carolina demands that white people in increasing numbers shall own the soil and till it with their own hands. The State's progress may be measured by the decrease in

average land holdings. An increase in holdings and a decrease in farm owners is the surest mark of retrogression. Every white man who moves to town and leaves his farm to negro tenants makes the country a less desirable place for his white neighbors and hastens the tendency, so sadly evident in some sections, to absentee landlordism and negro tenantry, with its accompanying deterioration of soil and decline of social life. The nominal land tax in South Carolina is an unmitigated menace to rural welfare. It gives the absent landlord or the large holder the opportunity to place his money in large sums where it will largely escape taxation and will surely bring princely returns through the steady increase in land values. In the meantime, it is farmed indifferently by negro tenants and kept out of the hands of desirable white settlers. The country boy, unable to secure land, moves to town or emigrates to some other section of the country. After a section is once depleted of its white population in this manner it will be exceedingly difficult to induce a return to the resulting unfavorable social and educational conditions. The situation contains the seeds of negro segregation and ultimate ownership.

In this connection it is impossible to view with complacency the acquisition of large tracts of coastal lands for game preserves, and their consequent disappearance from the available assets of the State.

Happily for us the tendency to smaller farms tilled by white owners is very marked in many counties of the State. These counties are destined to play the title role in future progress.

Every man in South Carolina should read the pamphlet entitled "The Causes of Southern Rural Conditions, and the Small Farm as an Important Remedy," by that seer and prophet of Southern agriculture, Dr. Seaman A. Knapp.

RURAL EDUCATION.

The third economic factor in rural life is the subject of education. It is a public calamity when any man from the country in South Carolina moves to town and does not leave in his place a man just as good as himself. Yet this process is going on continually. Strange to say, the high price of cotton has

only slightly checked the movement. Its causes lie deeper than mere material prosperity. When you go to these men in the town and ask them why they have left a productive farm for an untried and often unsatisfactory city experience, in nine cases out of ten they will reply: "I have done so in order to send my children to school." The more prosperous the farmer, the greater his desire to give his children educational and social advantages. He has schools at home, to be sure, but these schools do not satisfy his new educational ideals for his children. It is easier to move to town than to develop at home the kind of a school which he demands. Recently it was my privilege to visit the rural schools of one of the most prosperous counties of South Carolina, in company with a local physician. With me he observed the buildings, equipment and surroundings, saw the teaching and observed the unsatisfactory and irregular attendance. After a trip of 175 miles he remarked: "We have been playing with the rural school problem in South Carolina." In many communities there are excellent schools, but the development of a county system has been neglected, the rural schools are without any adequate supervision, and progress is solely a matter of local initiative. Frequently the people themselves do not know what kind of a school they want, but are fully convinced it is not the kind they have. From such sections you find invariably that there is a steady exodus of the more ambitious type of citizens.

Within recent years, however, a school of the better type is finding a place in many communities in South Carolina. These people have abandoned the one-room school house with its miserable equipment, untrained teacher, its irregular attendance and its lack of social incentive, and have built the consolidated school, employing three or more teachers and affording to the people the opportunity for that co-operation which is necessary to the development of a strong community life. In a community of this kind the white population is contented as well as prosperous and there is a steady increase in the number of families composing it. The social life of the people becomes more satisfactory. Having learned co-operation in their work for the school, the habit is easily carried over into other phases of community life. To develop a well organized

system of rural schools with efficient administration and competent supervision, with a course of study adapted to the special needs of the country, is the first essential in the development and enrichment of rural life in South Carolina.

NOTABLE PROGRESS.

It is not necessary for me to say that every year witnesses marked advances in the comfort and convenience of the average farm.* The good roads movement is bringing the farmer and his products close to market. The rural free delivery puts him in daily touch with the current news and the great world-movements. The rural telephone annihilates the distance between neighbors and breaks the isolation which has so long been one of the drawbacks to rural life. The Agricultural College, the State Department of Agriculture and the Farm Demonstration work have combined to improve farming methods and to make the soil yield more abundantly. This fact in itself makes possible better schools, better churches and better home surroundings. A number of forces have joined hands to stamp out the diseases which constitute so great a drain on the energy of the country. The farm home has come in for a share of our attention and is gradually being equipped with the conveniences and labor-saving devices which ameliorate the lot of the woman in the country. The automobile and the improved farm implement have come to save the farmer's time and to give him leisure for the development of his intellectual tastes and for a fuller participation in the social life of his community. The best thought of the whole nation is now turned to the country, and we may confidently expect the next ten years to bring forth a new era in American farm life.

APPLICATION OF SCIENCE TO AGRICULTURE AND INDUSTRIES.

Address by DR. SEAMAN A. KNAPP.

Science is an exact knowledge of anything under consideration. In an ordinary sense it is mainly limited to a knowledge of such elementary facts as can be reduced to exact conditions. In chemistry it would thus include mainly inorganic chemistry because in this we are dealing with bodies that give fixed and definite results in their relation to other bodies, while organic chemistry is so affected by life forces that given combinations give varying results. In botany this narrow definition would limit the investigator to the nature and habits of plants, their structure, how they feed and grow, without regard to that larger relation of plants—their use and value to the human race.

There is, however, a broader definition of science, which extends natural sciences to their application, and applies science to the arts; to all occupations and industries; to trades; to professions; to political science and government—and in fact, to all the affairs of men; so that everything human may be classified and scientifically administered for the betterment of the human race.

In the earlier ages of the world, science was an occult art and was mainly followed for the purpose of devising some process of making gold, or silver, or diamonds, the object being to get rich quick—some short way of acquiring vast wealth, unknown to others; but gradually it was broadened somewhat. Yet, up to the present time, nearly all of these sciences have been studied mainly in their abstract and general relations rather than in regard to their application to the affairs of life. It is in this broader sense that I wish to discuss the great value of science, its rapid growth and development, and the enormous influence it can exert for the betterment of human affairs. Thus the broader science, if applied to agriculture, instead of limiting it to soils, their chemical and mechanical conditions, fertilization and plant growth,

would be extended to cover the renovation and preservation of soils, the science of production, utilization and marketing of farm crops and farm animals, so that every acre of land would be worked in the most intelligent way to produce the best varieties and the largest crops; it would cover the science of economic farm improvement, such as the most economic and the most durable fences, the cost of buildings and their efficiency with relation to the farm and the purposes to which the farm is devoted; the production of timber and wood for the uses of the farm; so that when the farm is complete it will be a unit with reference to the certain purpose for which it was intended, just as much as a factory with all its machinery is adjusted to the production of a given product, requiring that any machine that is obsolete should be cast aside. Most of the farms at the present time are nondescript. There is no unity of design; the fences are temporary expedients; the buildings are constructed, not with reference to an end, but to the size of the pocket-book or the owner's whim. Some are not even constructed; they artificially grow by a series of patch-work. The fields are not arranged for the greatest convenience and the buildings serve little purpose. It costs in some cases almost double what it should to work and manage such a farm. Again, the average farmer obtains from the soil only half to a fourth of what he should receive. In many cases this has been corrected, but it has been at the expense of additional labor. Science should be extended to the art of production, so that while we double the crop we at the same time halve the labor expended upon it and thus increase the profits more than four-fold. The appalling annual losses from these sources amount to more than two billions of money, all of which might be saved if all the farms and their management were brought under scientific observation and arranged in accordance with the best system.

We have noticed with alarm the cost of provisions for the masses. This is the result of the lack of scientific management. Factories have gone to the great cities; the operatives, owing to the cost of land and dwellings, are deprived of the comforts of a garden and necessarily lose the labor of a portion of the family that might be expended to produce the food

supply. If the minor cities of this country were brought under scientific direction and the effort that is now being put forth upon the school gardens could be transferred to the vacant home lots, a large proportion of the families in villages and smaller cities could produce a full supply of vegetables for the family without cost, and this would immediately reduce the expense of living very materially. Then in rural districts large sections of country have no home gardens. The children who attend school, if properly directed, could be of material assistance to their parents in furnishing the family with food, both animal and vegetable.

There is not one farm in a thousand where science has been brought to bear to give exact knowledge of what it costs to produce. If a thousand men were asked the question, what is the cost of producing a bushel of vegetables of a given kind in a garden, or of a dozen eggs for the family, it is a stretch of imagination to say that even two would be able to reply. There is neither sense, nor good judgment, nor wisdom for the high price of provisions in the United States. If all the people would go to work and use the education they have, or the training they have, in the direction of production, and thus classify and come to an exact knowledge of the cost of producing given articles of food and the best method of producing them, then we should be able to reduce the cost because we should have some standard of judgment. There are about two million persons employed by railroads, nearly all of whom are the heads of families, thus representing about ten millions of people. Nearly all of them could have gardens and poultry yards. There are approximately six million employees in factories, probably representing fifteen millions of people. Most of them, by a slight readjustment, could have gardens. Thus twenty-five million of people could reduce the cost of food nearly one-half if they were shown how; and what would be to the world a greater gain than the money value of the food? Idleness would be corrected; industry, economy and thrift would be taught, resulting in a more vigorous and potential population.

Take another line in which we are greatly interested, and that is transportation. It has been stated recently on very

intelligent authority that if the railroads would apply science to their management they could reduce the cost of transportation in this country three hundred millions a year. In the first place, our railroads are all constructed upon that heavy order designed only for long hauls. They are expensive and cumbersome and unscientific in the extreme, as a whole. For instance, they oblige the farmer to haul his products from one to twenty miles to reach a station, at an estimated expense of twenty-five cents per mile for each ton delivered. Then many of the small stations are non-paying; the business is too small for that class of railway. The method of stopping and re-shipping is not only slow, but cumbersome. In the transportation of goods from Lake Charles, Louisiana, to Washington, I noted that an ox team loaded with goods could have made better time than the railroad service. What is needed, allowing that the present system of railroads is adapted to heavy and long hauls, is a system of electric lines and of macadam roads leading out from every great center in a State, by which the products of the farm could be brought into that center for transportation to other great markets. Millions of dollars could be saved to the public, both in economy of time and transportation. Our transportation is too uncertain. I will give a single instance: In England a co-operative store with \$1,000 capital, can do more business than a similar store in the United States with \$10,000 capital. The reason is that their transportation is more exact and certain in England and goods can be bought to be delivered a few every day. The difference between part car-load lots and broken lots is less. In the United States if anything like basal prices are to be secured we must buy in car-load lots; First, because we can buy cheaper; secondly, because the transportation is so much less, and thirdly, the uncertainty of delivery makes it necessary to carry a large stock in order to be ready for trade at all times. Then, the methods of transportation should be more scientific. The farmer frequently sends to one market when, if he had sent to another market, he could have received 25 or 30 or 50 per cent. more for his product. One market was over-stocked and in the other there was a deficiency.

Our banking system is a patch-work of past inefficiency. It is really composed of all the impossible theories that have failed in the history of the world. The only good thing that can be said of it is that it is fairly safe for the owner of the stock. Now, money is only a commodity, to facilitate exchange. The amount at hand should be in proportion to the volume of exchange at a given time. Instead of that, when a stringency arises and the public needs more money it really has less, and when there is an inflation and it should have less money it has more. Then, too, there is a tendency for the money of the whole country to seek centers and to be piled up in great amounts at those centers, thus stimulating gambling in stock and the capitalization of all sorts of things, whether useful to the world or not. If a real scientific monetary system could be inaugurated in the United States it would be of incalculable value to all our industries.

In another respect we have violated what is for the best interests of the people. Our whole national system is arranged on a basis of using the money of all the people for commercial purposes. A mortgage is not good in a National bank. This should be modified or remedied in some way, so that the money of all the people may be available for the uses of all the people in a sane and safe way. There should be a scientific commission to investigate and report. Instead of that, all the reports come from the interests in banking, and, with due deference to the high honor of the parties making such reports, they are made mainly to aid the interests of the few as against the many.

Possibly of all the things nationally controlled, the most unscientific is the tariff. I speak of this without any reference to party policy. A tariff is blocked out by the Committee on Ways and Means of the House of Representatives. Then commences a struggle between the interests. Each interest strives to get the most that it can and to have the other party receive as little as possible. Generally a combination is made of the interests that can command the most votes upon an agreed schedule, and other interests are added till a working majority is secured. It is a question of interests and when the tariff is finished it is not possible for any sane man, if he be

honest, to defend it as a whole. This is true of every tariff that has existed from the foundation of the Government. We never have had a scientific tariff. That is, a tariff which is as nearly just as possible to all interests, and produces revenue with the least disastrous effects to other interests.

Another important topic which should receive immediate attention is the food and clothing of the world. With all our boasts of superior intelligence in the United States and the thousands of schools for elementary education and higher education, and the millions of money expended every year, we are the most unscientifically clothed and fed of all the nations of the earth. In fact, science has nothing to do with it, nor utility, nor even common sense. Our clothing is a dictate of fashion and our food a fiction of the appetite, and nobody knows, at least nobody has ever discovered, from what source the fashion originated and the appetite was evolved. Can anybody give a sufficient reason why, when we go to a high grade restaurant or hotel, we should be taxed at a given meal fifty cents for the food, one dollar for the waiter that stands behind us, and then add to the dollar a tip for inconvenience? Or can anyone give a reason why good and substantial clothing in a respectable condition should be thrown aside because it is out of fashion? It is safe to say that the American people could be scientifically fed and better nourished at half the present cost and greatly to the improvement of health and the abolition of disease, and that at least twenty-five per cent. might be saved in the clothing of the people and they could be equally well clad. If a saving in both of these directions could be made of \$20.00 per capita for the year it would mean nearly two billions of money annually.

Another still more vital item is the extension of the life period of all people. If we estimate that the number of persons in the United States who are workers, including all kinds of work, at fifty millions, and that their services are worth for productive and economic purposes \$100.00 per annum, the value of the extension of the average lives of the people one year would amount to five billions of money, and it is claimed that if there could be a scientific adjustment of food and

clothing and labor in all these different lines, human life might be extended at least twenty years upon an average.

Now, as to the remedy: Human society is organized in this country upon a purely selfish basis. The young person goes to school and becomes a teacher, and he feels that his calling is where the largest salary is offered. The doctor devotes himself to professional classes, gives his exclusive time to those who pay and in proportion to the amount paid, and the same is true of the attorney and, I regret to say, almost equally true of the minister of the gospel. It is not my intention to censure anyone. It is the plan upon which our society is organized—the plan of self-interest. Now, suppose we reorganize society and introduce the science element into all our organizations, what would occur? The teachers in all the rural schools and in the city schools would endeavor not only to impart a book knowledge, but the applied science knowledge. Every yard in town and city would be improved and used for food purposes or for flower purposes. Every child in town and country would have employment. The school garden would largely be transferred to the home and farm, and instructions would be given in dairying and the production of poultry for purpose of the food supply. Fruits would be studied and the teacher would find his or her vocation greatly enlarged, so that the teacher would teach books for perhaps half a day; the remainder of the time would be employed in demonstration work among the patrons of the school. So thus there would be great accomplishment. Everything would be produced, not only upon the best, but upon the most economic method, and abundance would prevail everywhere. Such a thing as poverty would be banished, particularly in the country, and the same to a large extent would apply to the city. The boys and girls would be studying crafts and producing foods and flowers in their yards or in the suburbs of the city, as they do in England and other countries. We should then have really an industrial population, intent upon the greatest success. Extended science thus far has been applied to factories, the great publishing houses and to great mercantile establishments, because the competition in those lines has been so great, and therefore they have been obliged to study

methods of management scientifically; but suppose this same method of management which applies to a factory, so that every item is known and estimated to reduce the cost of production and the science of selling is studied, and transportation considered, could be applied to the country merchant and to the rural supplies and methods of transportation, so as to inaugurate the greatest economy, what a tremendous result there would be! We will take as an illustration the Standard Oil Company, one of the most scientifically organized corporations in the world. It has made its vast fortune by scientific methods of production and of distribution. When it entered the field kerosene was distributed in barrels, a very wasteful system. Frequently half the contents of the barrel was lost from leakage, the freight costs were very heavy and the whole uneconomic. The Standard Oil constructed their pipe lines, sending their oil direct from the wells to the great ports of the country, so that they can transport the oil by water to all parts of the world. Then they adjusted ships to carry it in bulk. And then they made great tanks on the cars instead of transporting it in barrels, and a pipe line to the railroad, so that automatically these tanks could be filled. They then arranged for such tanks at every point of distribution and then finally a tank on a wagon to transport it around; and thus oil for which we used to pay 50 cents per gallon before the Standard Oil entered into competition, was reduced to 10 and 12 cents after they had completed their remarkable methods. Standard Oil carried its methods into England and drove the Russians out of that country by reason of its scientific methods of distribution, and just so in Europe and Asia. Now, what is true of Standard Oil could be true of a great many other industries. They could be reduced enormously to the people if it were not for this extravagant and unreasonable and unscientific method of manufacture and distribution. We are paying an enormous price for the lack of system and organization and scientific methods. Suppose science be universally introduced, what will occur?

The tendency would be to cut out all monopolies, or, at least, to reduce the price so low that many things now beyond the possibility of possession by the average toiler could be

enjoyed, not as a luxury, but as a part of the daily life. The doctor, instead of confining himself to the treatment of those who pay, would be employed by society to prevent disease, to teach the laws of sanitation, proper nourishment and exercise, and thus promote so high a vigor that disease would find every avenue to the human body fortified against its attacks. In other words, he would become a great missionary for the uplift of the body towards universal health and vigor. The lawyer, instead of simply devoting his services to the litigant, would organize the people to prevent disputes so that the average man might understand his rights under the law and how to observe them. In many countries this is done because the common people are too poor to go to law, and, therefore, they must be taught how to obey the law.

Under the new regime the churches, instead of devoting their funds to the maintenance of an organization for their own comfort and simply expounding the truths of the gospel on the Sabbath, would put most of their energies into efforts to better the people every day, and would become a force of great effectiveness in the welfare of men. They would be leaders in practical morals and in social reforms; in simple habits and plain living; they would be first at the bedside of suffering and last to leave the abode of want or penury.

If the school teachers and doctors and lawyers and churches would thus combine and create a public opinion that would systematize every industry, not only the farm, the garden, the production of animals, methods of living and clothing the people, the more economic preservation and consumption of foods, the distribution of all products, etc., but a day of general uplift would be at hand, and we should soon behold our nation surpass all others because it availed itself of its possibilities, improved its opportunities, arranged all its affairs so that there should be no loss of economy in anything, and reduced all human effort to a scientific basis, and thus glorified science by the saving of the race from selfishness, from penury and from ignorance.

THE PURPOSES OF THE FOUNDERS.

Address by PROFESSOR WILLIAM H. HAND.

Seers, prophets, founders, builders! How much mankind owes to their genius and their courage! The material, social, intellectual, and institutional growth which mark the ages are due to the constructive genius of a few choice spirits able to discern and brave enough to do. Men of clear and enlightened vision, of rational and determined purpose, and with souls on fire to do deeds of lasting service do not stop to ask what short-sighted opponents may say or do. Strong men, inspired with great ideas, stake their all on what they undertake, and mankind reaps the fruits of their faith in themselves and their devotion to their causes.

Such thoughts come to us as we are assembled here to do homage to the memory of a group of men through whose wisdom, foresight, and heroism was founded what is now the University of South Carolina. At one sweep these seers measured the needs and the possibilities of a commonwealth and set to work to found an institution that would minister to her needs and develop her possibilities. Theirs was a task of constructive statesmanship. None here need be reminded that the institution was founded in the face of ardent opposition. That opposition, as is often the case, came chiefly from those whom it was to benefit most. However much we may admire the splendid courage with which these founders strove, we are more particularly interested here in the purposes which inspired them. Governor Drayton, in his message to the General Assembly, states the purpose in one ringing sentence: "To found an institution not promoted by local views or party prejudices, but springing from the united voice of an enlightened Legislature; projected as a rallying point of union, friendship, and learning for the youth of all parts of the State."

A century ago the people of the State were sharply divided into two camps—the low-country and the up-country. In the absence of modern modes of transportation they were widely separated geographically, and still more widely politically.

Peoples thus separated usually entertain against each other strong prejudices, and prejudice thrives on ignorance. These founders saw with the vision of inspiration that light is the best solvent of prejudice, and that light was the one thing necessary to union and friendship. The solidarity of a State through some common medium was the problem.

The founders of the college were sagacious in locating it at the geographical center of the State, at a place easy of access to all the people of the State, and at the seat of government of the State. At the capital gather frequently much of the best brain and character of the State, giving wholesome impulse and direction to the lives of the young men here in training; and from this center the influence of strong men has radiated to every nook and corner of the State. The very location was destructive of provincialism and conducive to catholicity of spirit and concert of action.

Measured by present standards, neither the faculty nor the student body has ever been large, but in its history not a few of the strong men of the nation have sat in her chairs of letters and science. Some of these men have wrought mightily not only in building a college and a commonwealth, but in formulating and promulgating principles in world-wide fields of thought and action. They, too, were founders, as truly as were Drayton and DeSaussure. From its walls have gone men of superior power, effective training, bold courage, high character and lofty ambition to spend and to be spent in the service of mankind. These men have made permanent contributions to the betterment of their fellow men in numerous fields—in science, in statecraft, in commerce, in manufacture, in agriculture. More than once it has been declared by men not given to extravagant speech that the life and services of one of these great leaders have repaid the State for every dollar invested in the institution since its establishment. Such might truthfully be said of any college with a century's history behind it.

The purposes of the founders bid us not to be content with the past alone, but to consider the present and to continue to build for the future. No institution deserves to live for any other reason than that it serves a definite purpose. No institution has any right to ask for support for its own sake, nor has

it any right to exist solely for the sake of past service. An institution to merit support must render present service and give promise of constructive force for future service.

The function of a State college a century ago was narrow as compared with the function of such an institution today. Its sphere has widened tremendously. Its function is no longer to prepare a few men for a few learned professions. The function of a modern State university is almost universal. In the language of President Van Hise, "The aim of the State university should be as broad as human endeavor and as high as human aspiration." The State university is supported by the whole people, and its aim should be to serve the whole people wisely. It should do for the people what they cannot do for themselves. The life blood of the State university should pulsate through the veins of every interest and activity of the State. Government, education, commerce, industries—all should be vitally related to the State university, or, better, the State University should be vitally related to them. Every public high school and elementary school in the State should be so linked to the State university that every heart-beat of one could be felt in the others. The health and comfort of every home in the State ought to be its care. The university is as much concerned about the public roads of the State as about interstate commerce; wholesome food is as necessary to a people as are wholesome laws; and the State university ought to be as deeply concerned about the purity of the water our people drink as about the purity of the language they speak. More and more are people coming to measure a university by the standard of Ezra Cornell. Said he, "I would found an institution where anybody can find instruction in any study."

Service is as imperative of an institution as it is of an individual. *Dulce et decorum est pro patria mori* sang old Horace two thousand years ago. A noble sentiment! But the singer who has caught the spirit of modern civilization would add, "It is sweeter and nobler to live for one's country." The university for the service of all the interests of the State!

People of South Carolina, the institution is yours. Every brick in its buildings was put there by you; every man in it is kept there by you. Every sentiment, and aspiration, and service

belong to you. The institution is still a-building; you are its builders. The University would say to you:

“Build me straight, O worthy Master!
Staunch and strong, a goodly vessel,
That shall laugh at all disaster,
And with wave and whirlwind wrestle!”

A LAYMAN'S NOTION OF A UNIVERSITY.

Address by DR. WALTER H. PAGE.

It is greatly regretted that Dr. Page's masterly address could not be secured in full for publication. The following abstract, copied from *The State* of January 13, 1911, gives only a partial view of this able and instructive address:

Somewhere in the course of a man's education he ought to have a chance to try to do anything he likes, so that he may discover his own aptitudes. By such an educational system we should develop not only farmers and builders and mechanics, but sculptors, musicians, statesmen, poets—anything that youth finds itself enthusiastic about. A boy would come to know some trade well. It might be farming; it might be fruit-growing; it might be the law; it might be scholarship. Really it matters little what it is—either to him or to the community. The only thing that matters is that he shall know and do something well.

He may or may not go to college; but in any event he will be educated—that is to say, trained. He may or may not be cultivated. But being trained to some thing, he will see to it that the community has no untrained person in it. To be untrained will become a disgrace, as to be sick will become a mere folly or crime.

MASS OF FACTS.

All the while, too, of course, a sufficient mass of facts could be easily taught about history and literature and the like. But much of our present waste of time on these subjects would be saved. Useless exercises in them would be cut out, and as a rule only those pupils would give most of their time to them that would profit by them. We should develop activities—develop the creative, the doing, faculties and aptitudes.

A child can be taught the underlying great facts about the most important processes of nature and about the most important uses that men make of natural objects within the time of

a usual school-experience, all this, too, along with the usual knowledge of history and literature and such things. And in this process, he will at every stage be taught by doing some thing. He will be trying himself.

Now the point is that somewhere even in his activities a boy would find what he was born to do—a trade—a craft, an art, no matter what. He would discover that he loves the earth and wishes to make things grow—that he loves music, that he is a born builder, or a sculptor. No matter what he discovers if he discover himself, and the school is the thing to enable him to find himself and to start in the way his aptitudes prompt him.

I do not mean to say that such a step as this is easy to take or that it can be taken quickly. I mean only to say that it is inevitable and necessary. And this fact—that such a complete revolution in education is inevitable and necessary—is the explanation of the present unrest in the whole educational world. The old metaphysical system, which by mysterious ways was supposed to “train the mind,” has failed, with its mysteries and the amount of rubbish that it had to carry. It has failed because it was based on the metaphysical explanation of man and his nature, and not on the biological explanation. And the biological explanation of man and of his ways of progress must determine the education of the future.

FOR OLD STANDARDS.

I wish here to make sure that I am not misunderstood. I am not crying death to all that the old education did and does. On the contrary, I stand for its aims. I have said, for instance, and I shall never recant, that a man can never become quite so cultivated a man in any other way as by once coming really to know the perfect workmanship of a Greek drama or a Greek oration. So far as I am concerned, there is no so-called practical piece of knowledge that is worthy of mention in the same lifetime alongside of the gleams of the infinite and of the intangible, and the tingle of the aesthetic sense that comes from the practice or even the appreciation of any great art.

But this seems plain to me—that the better way to teach

these things and the only way to save them and to make them live in our lives, is to teach them, not by a routine of dull compulsion, but to teach the arts—the arts and literature about them—by practice. Practice—the effort to do and to make—will awaken the artistic spirit. The new education will not only save what we call the culture studies, it will for the first time put real life into them.

I trust, therefore, that you will at least not regard me as a bloody revolutionist, but, if you please, as a cultural or even æsthetic revolutionist.

And now to go on with the story. As I was about to say, we are already passing into this new conception and practice of education. But the important task—the overwhelmingly important task—is to adapt it and apply it to the public schools—to the masses of the population, children and adults. You are beginning to do this—making some notable efforts at it surely—in South Carolina. And you can do it the more easily here, perhaps, because your public school system is yet in the process of developing and has not become hardened into the routine of the old system.

PERIOD OF TWILIGHT.

So we are passing or have passed through a period of twilight about manual training—a period of educational fads.

To see education whole and clear one must see man whole and clear. Man is an animal of intelligence and character. Body, mind and character are inextricably bound together, and dependent on the body. We must look at man as a unit. He is not merely mind. He is not merely character. He is mind and character—he is body and mind and character. There is no such thing in any school room in South Carolina as a mind without a body. In the long journey from partial views of life to the view of life as a whole, what a rough way we have come! And the tragic unevenness of the road!

THE DEAD PHILOSOPHER.

I knew a man who spent his life in one-sided educational endeavor. To him education meant work in a particular

psychological groove. He was a scholar in philosophy, so-called. He worked at theories of mental activity. He wrote learned treatises, which only a small group of similar men read. By these he made a reputation among that little group—a little group that worked on the mind as if it were something quite independent of the soul. He was sure that he was making headway with education. But the world knows nothing of what he discovered or formulated.

Although he was born strong, and had had a robust boyhood, a good constitution, as we say—yet he lived only a little beyond fifty. After he died, a tablet was put up in his college to his memory. It is sad to read this tablet in praise of his great scholarship, and of his large wisdom, and then to recall the horrible truth—he committed suicide by constipation. If his view of life and his view of education had included even the simplest facts about eating and of the care of his own body, he would have been alive today. And to be a live man is better than to be a dead philosopher.

The school is, of course, fast getting away from the old-time subject-matter of all schools—the foolish old arithmetic, the scrappy reader, the criminal grammar and the start straight toward Latin, even if a boy was in training for the plow and would never read a line of Cæsar in his life. All that rubbish, I suppose, is gone. And any man who would weep over it would shed tears over the shifting of a sand dune on a desert.

WE ARE UNEDUCATED.

Let us look at the result of our old system. Make a frank and candid judgment of it. We (you and I) are not educated—that is, we are not trained. For instance, what can you do yourself—what have you trained yourself to do so well that you are expert at it—that you get joy from it, that you have pre-eminence in it? How have you added beauty or culture or grace or real value to your community—more than the ordinary?

Did you ever make a beautiful piece of furniture with your own hands, or can you play a great piece of music? Can you put the plumbing in order in your house? Can you write a

sonnet? Can you read Homer or Vergil or Dante or Goethe at sight? Did you ever plant a tree to make any sunny place more shady? Is there an acre of ground that is more rich or fertile because of your work—or a scene more beautiful because of anything that you have done?

We do not get all the high joys of life. Let us modestly look facts in the face and realize that we have been fooling ourselves about ourselves and about the great glad chances and high pleasures in life that we have missed, and let us set to work and train our children so that they will find life a glad succession of efficient activities and primary joys—from all their senses. That would be education in fact!

THE GOOD THINGS.

What are the desirable things in life? Are they not health, a reasonable plenty, skill at some good work and joy in doing it, an equable temper, fair judgments, pleasant relations to our fellows, sound thinking, freedom of opinion, domestic happiness? These are the things that mean success and joy of life. We have a fair measure of them. But think them over and see how far our present methods of education contribute directly to them; or let us take a practical measure of ourselves as Americans. We call ourselves efficient. We have in our so-called higher education taken much from the Germans. But there is one thing that we have not learned from them—namely, skilled training.

Of the things that we export from the United States about 90 per cent. of the value consists of the value of the material and about 10 per cent. consists of work done on it. Of the things that the Germans export about 10 per cent. of the value consists of the raw material and about 90 per cent. of skilled work done on it. Much, of course, of that raw material is our own, and he has his chance to make useful and beautiful things of our material because we can not make them, because, in a word, we are untrained.

There was a very high level of civilization in South Carolina at the beginning of the last century. The great men of the Revolutionary era yet lingered or were just passing away

and the high impulse of that noble struggle was yet active. There was a generally diffused prosperity—among the whites; and there was a social order of very extraordinary merit for a land that was yet in its first youth. But the enervating effects of slavery, the shifting of political power to other parts of the Union, the rise of modern organized industry elsewhere and the persistent inability of the old South to recognize the value and necessity of organization, and especially the coming of a war that turned the land into a battlefield—these forces and events definitely set civilization back. The South Carolina of your youth and mine was not as good a land to live in as the South Carolina of half a century before had been.

BETTER AND BETTER.

But how is it today? If my measure of civilization be made by the right standards, the South Carolina of today is a better place to live in than it ever was before; and most of the change that has come has come in these 20 years. Prosperity is diffused, training is within the reach of an increasing number, freedom of opinion, very like the freedom of the spacious old days, is restored; and the land is better tilled and conserved and the people are full of hope. They know and feel that they are going forward.

It is, then, on a rising tide that you sail. You know that you are making life better worth while for all the people who dwell in this big commonwealth.

You who teach or you who direct this great awakening—perhaps even you sometimes encounter personal discouragement; for most men do—even the most resolute. The world is full of fools who are obstructive; sometimes they exert positive opposition, and always they are in the way by adding to the general inertia. If you ever feel discouraged, even for a moment, I assure you that, looked at from the outside—by which, it may be, the best measure of it is got—your work seems among the very noblest done anywhere in the world.

When a man reaches middle life and tries to make true judgments of values and no longer accepts conventional values—then nothing counts so much as the solemn gratifica-

tion that comes of having unselfishly served one's fellows; and that high and lasting satisfaction awaits you in very large measure, and, I am sure, there awaits you also the grateful appreciation of your countrymen and of those who will come after you.

THE UNIVERSITY.

The boys or girls that come up to college, therefore, will be the picked boys and girls. It will be a great distinction to be admitted—a physical distinction, an intellectual distinction and a moral distinction. The college will consist of moral, well-trained, strong, joyous, eager, upright youth, and no others will be admitted. The dull, the lazy, the physically weak, the erratic, the immoral—there will be asylums and sanitariums and hospitals for them. The college is no place for them. For there belong the elect, the chosen—the clean, the efficient, the happy, the ambitious, the capable.

And the first task will be to fix on them still more definitely all good habits of life—the proper care and feeding of the body (think of a college, of all places, where all food is not perfect—from the stomach's point of view), systematic exercise; the good habits of mind—methodical, intellectual work and the training of the judgment; and regular practice at discovery and at some art—finding out new things in an orderly way (research) and making something in an orderly way.

To take literary studies and work, with which I happen to be more familiar than with other kinds of work. In a college every boy should, of course, come in contact with as much literature as possible—should learn the large facts of literary history and should read as many great books as possible. But the boy who has an aptitude for literature should learn it also by trying to make it, not by merely reading it. That's the especial task he should have to do. I conceive that a boy who wished thoroughly to understand Shakespeare would be most likely to do so by taking the subject of a play—say Julius Cæsar or Macbeth—and try to make a play himself. If literature is going to be his business he might begin to work in literature, as well as to read it—just as, if law or engineering or chemistry is going to be his business, he does now begin in the school to work in law and engineering and chemistry. He must learn, in a word, by doing.

THE LIFE AND WORK OF THE LATE DR. SEAMAN A. KNAPP.

Address before the University

By IRA B. WILLIAMS.

The following address, commemorating the life and work of the late Dr. Seaman A. Knapp, is added as an appropriate appendix to the exercises of Founders' Day, in which Dr. Knapp bore so prominent a part:

The purpose of this address, I feel sure, is not to eulogize Dr. Knapp, but to give some facts in regard to the life of a man who did a great and useful work, in order that it may be helpful to you, young men, in starting out in life to live a life of the most usefulness to yourselves and to others. I am sure that Dr. Mitchell entertained this feeling when he invited me to talk to you, and it is in this spirit that I have prepared what I have to say in regard to Dr. Knapp's life and work.

Young men, especially college students, think a great deal about the life they should live and what they should do. The best way to help solve these questions is to study the lives of great men; see what it is about them that has been revered and has given their name to posterity. Living in the age we do, and facing the future we must face, it is especially important that we study the life of Dr. Knapp. When we review the lives of great men we do not find any who became renowned as a benefactor of mankind as he did. We are facing and will continue to face new conditions. We are looking toward an age of peace and uplift rather than of war and destruction. Having this spirit, he rendered service in this way. Then, too, he did not grow old, as some men do, thinking of the past and the good old days, but as a prophet with a vision of the future. This makes his life a more beneficial study for us, especially since his dreams were about the South, which we love so well and where we should cast our lives. One of his thoughts about the South is this: "To me the Southern States surpass all of the countries of the earth of equal area in material resources, mainly undeveloped. Underneath almost every acre is concealed a mineral wealth of surpassing value; within almost

every acre are agricultural resources that, touched by intellect and labor, will reveal marvelous products. To me the Southern people are the purest stock of the greatest race the world has produced. The rural population has lived under unfortunate conditions for the best development, but the essential material of their nature is not impaired, and it requires but leadership to maintain great results. 'Scratch a Filipino and you may uncover a Malay;' scratch a poor white of the South and you reveal a hero. Great gains have already been made and greater are yet to come."

That he produced results, I have only to cite you to some of his accomplishments. At the time of his death, especially in the South he was probably known and revered by more people than any other man that has lived in the past or is living today. His life was such that all the people, the farmers, the merchants, the business men, the women, the boys and the children knew him. In my judgment, history does not record a man who, for similar reasons, has been so much honored. We have read in history, a few of us, about the great men in the past. A few more of us probably know something about the great men who have figured in the political development of our country, or who have been brave in war and made a name for themselves as leaders along these lines; but all of us know something about this simple great man, who became a leader and a thinker along lines which tended to broaden, to uplift, and to give a happier home and a better life to more people than any other man who has lived in this generation.

One man says that his power lay in organization; another, in the fact that he knew men and how to help them; another, that he knew the needs of the people of his time. Dr. Page said, "He knew better how to help humanity than any man I know"; another notes his kind spirit and idea of service to humanity. It seems to me that the things which characterize him most were said by the man who, realizing that he had the spirit and the love to do the work he did, said that he not only knew the needs of the people and what to do, but also had the ability to do it.

Probably one of the first things you would like to know is the kind of education he received as a boy. I understand that

he was well trained in literature; that he had the culture given by a close study of the languages, such as Latin and Greek. I know that he took a great deal of pride in the study of English. In talking to me once along this line he said: "We should be careful in diction." One illustration was this, that if a man was going to speak of a plain, in order to describe it with much force, he would say "not a great plain, or a large one," but his meaning would be best conveyed by saying "an extensive plain." He advised especially a careful study of the standard writers of the English language. I speak of this, because I think it was not an unimportant point which contributed to his ability to do this work. He realized that a man to lead others must not only have the right spirit and know things, but he must also have the ability to convey his ideas to others. One man also says of him: "He longed, in his younger days, to sway men to the effectiveness of human speech. He was even then a polished orator. He had the gift of lucid statement. He could weld logic into forcible argument and ornament it with the graces of speech. Clear of thought, perfect in diction and with an attractive voice and manner, yet he, himself, has said that not until the later years of his life had he come into the power he sought." At the time of his death I considered him one of the greatest, if not the greatest of orators, and he was probably sought as a speaker purely for his ability as a speaker more than any other one man. These facts in the life of one of our greatest scientific thinkers, I think very important. It also teaches us, as young people and old, an important truth that:

"The heights by great men reached and kept
Were not attained by sudden flight."

It is also important for us to note that he spent nearly seventy years in preparation to do the great work which he did the last ten years of his life.

Dr. Knapp was born December 16th, 1833, in Essex County, N. Y. He took his collegiate preparatory course in Troy Conference Academy at Poultney, Vermont. He graduated at Union College, Schenectady, New York, in 1856. He mar-

ried, in August of the same year, a lady who had been a student with him in the preparatory school. He and his wife became teachers in a collegiate institute at Fort Edward on the Hudson. In January, 1863, he left the academy and bought the school at Poultney, Vermont. Because of an accident and bad health he was forced to give up his work here, which had a very bright and prosperous outlook, as well as personal attractiveness, and moved to a home in Iowa on the prairies. This marks the beginning of his agricultural work and is one of the most important incidents in his life. When we think of the wonderful work which he afterwards accomplished, which was brought about by reason of this change, we cannot help but think of the hymn:

"God moves in a mysterious way
His wonders to perform."

He spent a year in the country and he was then for two years pastor of a Methodist church in a small town. Afterwards he was for six years president of the college for the blind, regaining his health during this period. It is stated that for seven years following his removal to Iowa, he had to use crutches. During this period of his life, he, no doubt, learned a great deal of practical agriculture and the needs of a pioneer people, and saw the forces that could be brought to bear, in order to help them to a better living.

In 1880 he took charge of the Department of Agriculture in the Agricultural College at Iowa and for one year served as president. It is said that, "during this time he modified the course of study and introduced new lines of work, improved the farm and increased the number of students until no other college, at that time, could claim as large a number of students taking the course in agriculture." In 1885 he moved to Louisiana, where he did a great work in building up that State. In settling people and teaching them how to make a living he probably learned a great many things which were of value to him in the farm demonstration work. In 1898 Secretary Wilson sent him to Japan, China and the Philippine Islands. On his return he introduced some new varieties of rice into

Louisiana and with his work there built up the great rice industry of the West. The Department of Agriculture sent him, in 1900, to Porto Rico; in 1901 to Japan, China, Ceylon and Burmah. When he returned to this country he was given charge of the Farmers' Co-operative Demonstration Work. He started, in a very small way, in Texas, with only a few agents, but the work was of such value and he guided it with such ability that it spread rapidly, until at the time of his death it was known to be one of the best organized divisions of the Department of Agriculture, and covered twelve States with a force of five hundred and fifty agents. Seventy-five thousand farmers received direct help and forty-six thousand boys were enrolled in its forces. These people were progressing rapidly with his leadership into that field, which he described when he said: "I am thinking of the orchards and the vineyards, of the flocks and the herds, of the waving woodlands, of the hills carpeted with luxuriant verdure and the valleys inviting to the golden harvest."

When Congress adjourned last year he had \$75,000 more than he had asked for. The General Education Board, which contributed liberally towards this work, always gave him any amount he named, and the only question asked was: "Can you not use more?" This year the Government appropriated \$350,000; the General Education Board \$113,000, and other organizations \$100,000. This, you see, is over a half-million dollars to carry on this work.

In looking over the statistics we see that in almost every instance these 75,000 demonstration farms produce twice as much as the average productions. Think of what this means in an industrial revolution. This does not include the 46,000 boys, whose average was even greater.

It is my purpose, in this address, to quote largely from Dr. Knapp in order that you might get his ideas as he expressed them, so the following remarks will be largely what he has said. We have probably heard too much in our school days about the fact that we should not devote our life or our ambition to making money. This fact is true if we mean the accumulation of wealth by a few, but one of the fundamental principles running through all the teachings of Dr. Knapp was

that the masses of the people should seek to create more wealth and should have more money. He stated that: "We must teach the doctrine—a universal prosperity based on intelligent agriculture and thrift, so that the average man is able to be a great man and an independent man, and on that hangs not only our prosperity, but our national existence and our liberties. It is on the thrift, prosperity and independence of the average man that our citizenship is based. I do not glory in the wealth of a few, but rejoice in the general distribution of wealth and prosperity for the common people." His spirit is made plain to his agents when he says: "I believe that when the common people come to their own they will be able to hold their own. Every man should be so stalwart that he is a model of defense and defiance to the world. Our project would have been sufficiently ambitious if we had said: 'We will increase the wealth and give the people greater earning power.' But other things that we teach incidentally are that we must improve the moral tone, the moral condition, and the whole prosperity of the people, and try to turn all avenues of the wealth that we create into the proper channels, so as to create a better people. But even this is not quite enough. We may have wealth and social prosperity and home comforts and not be a high-minded, stalwart, courageous, and brave people. We must teach that. I want you to feel today that you have hold of one of the greatest lines of social uplift and development and greatness that exist. You may have conceived that something else was greater; that if you could use a facile pen like Washington Irving or some of the great writers of the age, that would be the acme of your ambition; or you may have thought that if you were able to speak with the wonderful expression of Demosthenes, or Burke, or Henry, that would be the summit of your hopes. But you are beginning at the bottom to influence the masses of mankind, and ultimately those masses always control the destinies of a country. If you allow their practices to sink lower and lower the country must ultimately drop to a lower level in its moral, political and religious tone, and we go down to degradation and infamy as a nation; but if we begin at the bottom, and plant human action upon the rock of high principles, with right cultivation of the soil, right

living for the common people, and comforts everywhere, and make wealth and prosperity all through the rural districts, the people will lend their support and all civilization will rise higher and higher, and we shall climb to the summit of human excellence and become a beacon light to all nations of the world."

I will give you now some short quotations from Dr. Knapp, which were selected by some of the men in the office and inscribed on a loving cup, which was presented to him:

1. "The greatest of all acquisitions is common sense."
2. "A prosperous, intelligent and contented rural population is, therefore, essential to our national perpetuity."
3. "A patent to land is a title to nobility, a right to sovereignty."
4. "A great nation is not the outgrowth of a few men of genius, but the superlative worth of a great common people."
5. "No nation can be great without thrift."
6. "Training is the great item which fashions a race."
7. "The world's most important school is the home and the small farm."
8. "The public school teacher's mission is to make a great common people and thus readjust the map of the world."
9. "The common toiler needs an education that leads to easier bread."
10. "It appears to be a philosophy of the Southern people to let money slip through their fingers without sticking."
11. "Let it be the high privilege of this great and free people to establish a republic where rural pride is equal to civic pride, where men of the most refined taste and culture select the rural villa, and where the wealth that comes from the soil finds its greatest return in developing and perfecting that great domain of nature which God has given to us in an everlasting estate."
12. "Any race betterment to be of paramount value must be a betterment of the masses."
13. "An idle saint only differs from an idle sinner in a coat of paint and direction."
14. "The greatest failure as a world force is the man who knows so much that he lives in universal doubt, injecting a

modifying clause into every assertion and ending the problems of life with an interrogation point."

15. "In general it is not the man who knows the most who is most successful, but the man who imparts an implicit belief in his message."

16. "Agriculture in most sections consists simply in a series of notions inherited from Adam."

17. "This learning Agriculture—which is a compound of the following ingredients, one-eighth science, three-eighths art, and one-half business methods—out of a book, is like reading up on the hand-saw and jack-plane and hiring out for a carpenter."

18. "These mechanic farmers now reside in a town or city, live out of a canned garden and milk a tin cow."

19. "The great battles of the future will be industrial."

20. "We are now prepared for the accomplishment of what we have so earnestly sought, the placing of rural life upon a plane of profit, of honor and power."

In talking with me a little more than a year ago, he told me that he had organized a work for the men and boys, and he did not want to die until he had done something for the girls. In discussing this question he said: "I want you, young men, to help think of something that we can do which will be of benefit to the girls, their mothers and their homes." In a speech shortly afterwards before the Rural School Teachers, in Aiken County, I related this statement, and told them that if they would organize some work for the girls, Dr. Knapp would gladly help them make it a success. Miss Marie S. Cromer, who was then president of the Teachers' Association, as well as the Rural School Improvement Association for the county, after the meeting, said she would like to do something for the girls, and suggested tomatoes. I then told her to proceed to organize a club and send in her rules and regulations, and that if they were practical, Dr. Knapp would be glad to give her all the help that he could command through the Department to make this work a success. Miss Cromer organized the club with the help of the County Superintendent, Mr. C. H. Seigler. Everything was forwarded to Washington and such help as was possible was given immediately. Later I visited,

with Miss Cromer, a number of the girls in the country and wrote a letter to Dr. Knapp, telling him of the work and how much life it brought into the lives and homes of the people where it was introduced. I understand he took this letter to Secretary Wilson and they were so much pleased with the work that Secretary Wilson told him to draw on him personally for money to carry on that work. In speaking at his funeral, which was held in Washington recently, Secretary Wilson said that this request was the only one that he ever made that Dr. Knapp did not carry out, but Dr. Knapp found a better way. Miss Cromer was then employed to give her entire time to the work, first being paid from the funds appropriated to the demonstration work from this State through the State Department of Agriculture. A short while before his death Dr. Knapp went before the General Education Board and told of his work among the girls and women, and asked them for nearly \$5,000 immediately, \$17,000 in October, and afterwards \$25,000 annually, to carry on this work in the Southern States. By this means his wish expressed to me was realized before his death, and this work I consider one of the greatest and most far-reaching of all that he did. By this means, and this was the beginning, thousands of girls, mothers and homes are being helped at this time, and its influence will reach through generations yet to come.

In summing up all these things, as a parting word, I would like for you to take home with you this one great truth, which he uttered, if none other:

"The power which transformed the humble fishermen of Galilee into mighty apostles of truth is ever present, and can be used as effectively today in any good cause as when the Son of God turned his footsteps from Judea's capital and spoke to the wayside children of poverty."

I want to say this to you, seek the truth and the expression of it and apply it to the uplift of the common people. The leader of the humble fishermen said, "Seek the truth and the truth shall make you free." He also said, "I am the truth." The people, when they saw what he did, stood in wonder and said, "Who is this, that even the winds and the sea obey Him?"

Department of Land Records and Agriculture, Punjab.

DATED LAHORE, 22ND MAY 1901.

Final Report on the Wheat Crop of the Punjab for the year 1900-01.

THE present report on the wheat crop has been delayed by about a week owing to the fact that the winter rains lasted longer than usual and the crop inspections were delayed partly on this account and partly to meet the necessities of Census arrangements. The area under crop also was very large, and the field to field inspections and compilation of statistics therefrom proved a task of larger magnitude than usual.

The season.—After the heavy rains in August and September large sowings were made on unirrigated lands, and the winter rains from December to March were so opportune throughout the Province that in some districts the crops on well lands were matured without the aid of irrigation. The fall in March was normal at Delhi, less than usual at Sirsa, Ludhiána and Mooltan, and in excess of the average at all the remaining stations; the excess was very large at Pesháwar, Umballa and Simla.

Area.—The first estimate of the area under wheat was 7,804,800 acres; the second estimate in March was 8,452,900 acres. The actual area according to the late crop inspections was 8,766,400 acres. This may be compared with 6,366,500 acres in the rabi of 1900—an increase of 2,400,000 acres. The increase per cent. over the 5 and 10 years' averages has been respectively 17·9 and 21·6.

As anticipated in the second forecast, the total area this year has been the largest yet on record in the Punjab. Simla is the only district which shows a decrease, namely of 9·8 per cent., compared with the sowings of last year. Increases above 100 per cent. occurred in the following districts:—

Hissar	...	...	...	187·7
Ferozepore...	...	...	...	100·9
Montgomery	...	...	...	118·0
Jhelum	...	...	...	101·9
Hazára	...	...	...	162·1

The increases in all districts are due to the excellent autumn and winter rains. The effect of this unusual rain on wet and dry lands will be apparent from the following figures of sowings :—

	<i>Irrigated.</i>	<i>Unirrigated.</i>	<i>Total.</i>
	Acres.	Acres.	Acres.
Rabi 1900...	4,024,000	2,342,500	6,366,500
Rabi 1901...	3,715,700	5,050,700	8,766,400

Thus the proportion of the irrigated crops this year has been 42·4 as against 63·0 per cent. of the whole in 1900, *i.e.*, in some places the crops on wet lands were matured without the aid of well irrigation, and consequently the unirrigated crops are more than double those of last year. The canals have been working well during the year.

Yield.—The total outturn of grain during the year is estimated to be 2,940,602 tons against 1,823,182 tons last year, giving an increase of 61·3 per cent. This gross outturn is 44·9 per cent. above the estimated average outturn of the last ten years, and 43·6 per cent. above the quinquennial average. In Umballa and Gurdáspur the outturn is said to be one of the best, both as regards area and outturn; the quality was specially good in Gurdáspur. In seven districts the crop was above the average. In Kángra the irrigated crops were below average and in the remaining districts the crop is reported to be about average in quantity. The estimated yield of irrigated crops per acre sown comes to 11·7 maunds, of unirrigated crops 7·2 maunds, giving an all round rate of 9·1 maunds per acre. The average outturn of all classes of soils last year was $7\frac{3}{4}$ maunds per acre, which was considered a 12-anna crop.

The character of the harvest.—The harvesting of this huge crop has been attended with more than the usual risks of failure. The crop was attacked in eight districts by rust, favoured by the cloudy weather of February and March. In nine districts locusts appeared during the month of April, but the wheat by this time was practically beyond the reach of their ravages. In Karnál, Hazára and Jhelum the grain shrunk somewhat owing to strong dry winds. In Rohtak, Delhi, Hazára, Kohát, Bannu, Dera Ismail Khan and Dera Gházi Khan hailstones slightly damaged the crop. Again the wheat crop also suffered from high floods in Hissar and from the excessive rains in the low-lying tracts of Hoshiárpur and from water-logging on irrigated lands of Tahsíl Pálampur in the Kángra District. But perhaps worse than any has been the

damage caused on the very threshing floors by the untimely rains and sudden storms of the last few weeks. There is reason to fear that to some extent the grain has been damaged; even sprouting has been spoken of; while in some places the bhúsa and chaff have been blown about and lost or damaged by the damp and rendered unfit for storing. The yield of corn on the whole is, therefore, estimated acre for acre at 14 annas (16 annas = 100 = normal). The gross outturn, considering the enormous area, will of course be much above the normal as estimated above.

Prices.—It will appear from the accompanying diagram that the prices of wheat at both the markets of Amritsar and Ferozepore were steady up to the first fortnight of June last year; from July to August they were nearly stationary; and up to the second fortnight of March the prices have been fluctuating between 11 and 13 seers per rupee. In the first fortnight of April the rate fell to 13 and in the second fortnight to 16 seers to the rupee owing to the advent of the new grain in the market. In Amritsar prices declined to 17 seers. A further drop in rates is probable, as the grain has been somewhat damaged by the recent rains.

Export.—The exports from the Punjab during the year ending 31st December 1900 amounted to 181,412 tons only compared with 294,794 tons in the year 1899 and 493,322 tons in 1898. The exports by sea from Karáchi fell from 7,267,470 cwts. in 1899 to 1,555,434 cwts. in 1900. These results were of course due to the famine.

Stocks.—The practical exhaustion of old stocks may be judged from the fact that prices of wheat have given way only slowly in anticipation of the present harvest, and that the drop in prices has not been greater than it has notwithstanding the large crop now coming into the market.

R. SYKES,

Offg. Director of Land Records and Agriculture, Punjab.

Final Forecast of the Wheat Crop in the

1	2	3	4	5	6		
DISTRICT.	ACREAGE.						
	Of current year's crop (1901).	Of previous year's crop (1899-1900).	Average of pre- ceding years.		Percentage by which column 2 exceeds (+) or is less than (-) area in		
					Column 3.	Column 4.	
						(a) Five years.	(b) Ten years.
			Acres.	Acres.	Acres.	Acres.	(a) Five years.	(b) Ten years.
Hissar	53,800	18,700	37,800	39,340	+ 187.7	+ 42.3	+ 36.7
Rohtak	69,200	37,600	80,040	77,670	+ 84.0	- 13.5	- 10.9
Gurgaon	62,000	38,500	49,160	47,010	+ 61.0	+ 26.1	+ 31.9
Delhi	125,300	84,600	127,340	131,430	+ 48.1	- 1.6	- 4.7
Karnál	213,400	188,700	185,840	155,010	+ 13.1	+ 14.8	+ 37.7
Umballa	210,100	136,800	204,440	196,190	+ 53.6	+ 2.8	+ 7.1
Simla	4,600	5,100	4,920	4,300	- 9.8	- 6.5	+ 6.5
Kángra	268,500	199,000	185,020	182,060	+ 34.9	+ 45.1	+ 47.5
Hoshiárpur	270,600	263,100	274,620	288,970	+ 20.9	- 1.5	- 6.4
Jullundur	291,700	239,900	283,020	278,210	+ 21.6	+ 3.1	+ 4.8
Ludhiána	188,700	157,800	138,840	129,040	+ 19.6	+ 35.9	+ 46.2
Ferozepore	569,400	283,400	461,560	456,360	+ 100.9	+ 23.4	+ 24.8
Mooltan	351,300	254,800	318,160	322,210	+ 37.9	+ 10.4	+ 9.0
Jhang	752,600	659,700	326,720	260,440	+ 14.1	+ 130.4	+ 189.0
Montgomery	241,100	110,500	188,440	208,180	+ 118.0	+ 27.9	+ 15.8
Lahore	527,400	335,900	428,520	422,470	+ 57.0	+ 23.1	+ 24.8
Amritsar	341,400	288,000	317,640	296,770	+ 18.5	+ 7.5	+ 15.0
Gurdáspur	320,500	285,800	266,160	268,540	+ 12.1	+ 20.4	+ 19.3

Punjab Province for the year 1900-01.

7	8	9		10	11	
OUTTURN.						
Estimated yield of current year, i.e., of area in column 2 (1901).	Yield of previous year, i.e., of area in column 3 (1899-1900).	Average of preceding years.		Percentage by which column 7 exceeds (+) or is less than (-) outturn in		
				Column 8.	Column 9.	
		(a) Five years.	(b) Ten years.		(a) Five years.	(b) Ten years.
Tons.	Tons.	Tons.	Tons.			
15,000	5,299	10,222	10,195	+ 183.1	+ 46.7	+ 47.1
24,037	12,248	26,542	26,162	+ 96.2	- 9.4	- 8.1
20,477	13,035	16,723	16,364	+ 57.1	+ 22.4	+ 25.1
39,224	33,901	42,280	42,694	+ 15.7	- 7.2	- 8.1
75,790	58,665	55,616	49,916	+ 29.2	+ 36.3	+ 51.8
55,641	26,599	56,004	51,732	+ 109.2	- 0.6	+ 7.6
971	823	944	819	+ 18.0	+ 2.8	+ 18.6
53,374	25,674	37,542	32,522	+ 107.9	+ 42.2	+ 58.7
58,473	39,669	55,940	59,400	+ 47.4	+ 4.5	- 1.6
106,090	65,059	90,220	92,077	+ 63.1	+ 17.6	+ 15.2
74,884	64,407	49,502	47,959	+ 16.3	+ 51.3	+ 56.1
174,679	70,475	113,005	121,808	+ 147.9	+ 54.0	+ 43.4
131,215	78,901	111,255	105,013	+ 66.3	+ 17.9	+ 25.0
375,471	298,711	112,951	87,302	+ 25.7	+ 232.4	+ 330.1
89,900	35,379	66,997	79,960	+ 154.1	+ 34.2	+ 12.4
183,548	96,872	132,930	135,957	+ 89.5	+ 38.1	+ 35.0
128,763	119,663	105,560	97,577	+ 7.6	+ 22.0	+ 32.0
122,055	90,138	89,704	87,362	+ 35.4	+ 36.1	+ 39.7

Final Forecast of the Wheat Crop in the

1	2	3	4	5	6		
DISTRICT.	ACREAGE.						
	Of current year's crop (1901).	Of previous year's crop (1899-1900).	Average of pre- ceding years.		Percentage by which column 2 exceeds (+) or is less than (-) area in		
					Column 3.	Column 4.	
					(a) Five years.	(b) Ten years.	
	Acres.	Acres.	Acres.	Acres.			
Siálkot ...	376,800	274,300	344,160	341,060	+ 37'4	+ 9'5	+ 10'5
Gujrát ...	308,600	159,700	306,000	314,760	+ 93'2	+ 0'8	- 2'0
Gujránwála ...	406,100	324,600	270,480	245,290	+ 25'1	+ 50'8	+ 65'6
Shahpur ...	248,000	150,000	220,260	220,580	+ 65'3	+ 12'6	+ 12'4
Jhelum ...	432,300	214,300	451,420	419,090	+ 101'9	- 4'2	+ 3'2
Ráwalpindi ...	408,500	407,600	477,360	426,460	+ 0'2	- 14'4	- 4'2
Hazára ...	268,400	102,400	113,820	109,46	+ 162'1	+ 135'8	+ 145'2
Pesháwar ...	377,000	250,200	272,080	256,350	+ 50'7	+ 38'6	+ 47'1
Kohát ...	109,700	90,400	108,560	99,250	+ 21'3	+ 1'1	+ 10'5
Bannu ...	297,500	224,800	291,140	289,330	+ 32'4	+ 2'2	+ 2'8
D. I. Khan ...	309,600	236,500	311,200	318,700	+ 30'9	- 0'5	- 2'9
D. G. Khan ...	140,800	135,500	154,140	164,300	+ 3'9	- 8'7	- 14'3
Muzaffargarh ...	221,500	208,200	234,880	238,940	+ 63'9	- 5'7	- 7'3
Total ...	8,766,400	6,366,500	7,433,740	7,207,770	+ 37'7	+ 17'9	+ 21'6

Punjab Province for the year 1900-1901—concluded.

7	8	9		10	11	
OUTTURN.						
Estimated yield of current year, i.e., of area in column 2 (1901).	Yield of previous year, i.e., of area in column 3 (1899-1900).	Average of preceding years.		Percentage by which column 7 exceeds (+) or is less than (-) outturn in		
				Column 8.	Column 9.	
		(a) Five years.	(b) Ten years.	(a) Five years.	(b) Ten years.	
Tons.	Tons.	Tons.	Tons.			
121,644	133,065	101,728	102,425	- 8.6	+ 19.6	+ 18.7
118,122	30,239	78,270	79,956	+ 290.6	+ 50.9	+ 47.7
149,695	108,421	95,702	81,142	+ 38.1	+ 56.4	+ 84.5
91,103	38,126	62,061	65,997	+ 139.0	+ 46.8	+ 38.0
121,076	14,992	93,460	98,892	+ 707.6	+ 29.5	+ 22.4
101,870	49,203	60,201	74,013	+ 107.0	+ 69.2	+ 37.6
72,206	25,446	25,647	24,935	+ 183.7	+ 181.5	+ 189.6
113,560	33,706	66,039	64,454	+ 251.8	+ 79.5	+ 83.9
29,545	24,058	27,634	23,855	+ 22.8	+ 6.9	+ 23.9
76,670	50,821	69,797	68,743	+ 50.9	+ 9.8	+ 11.5
91,899	76,841	85,598	92,162	+ 23.5	+ 10.9	+ 3.0
40,546	34,184	41,009	39,639	+ 18.6	- 1.1	+ 2.3
75,974	68,559	66,311	68,215	+ 9.5	+ 13.2	+ 10.1
2,940,602	1,823,182	2,047,394	2,029,249	+ 61.3	+ 43.6	+ 44.9

Diagram showing the Rise and Fall in Prices of Wheat during the years 1899-1900 and 1900-01.

AMRITSAR DISTRICT.

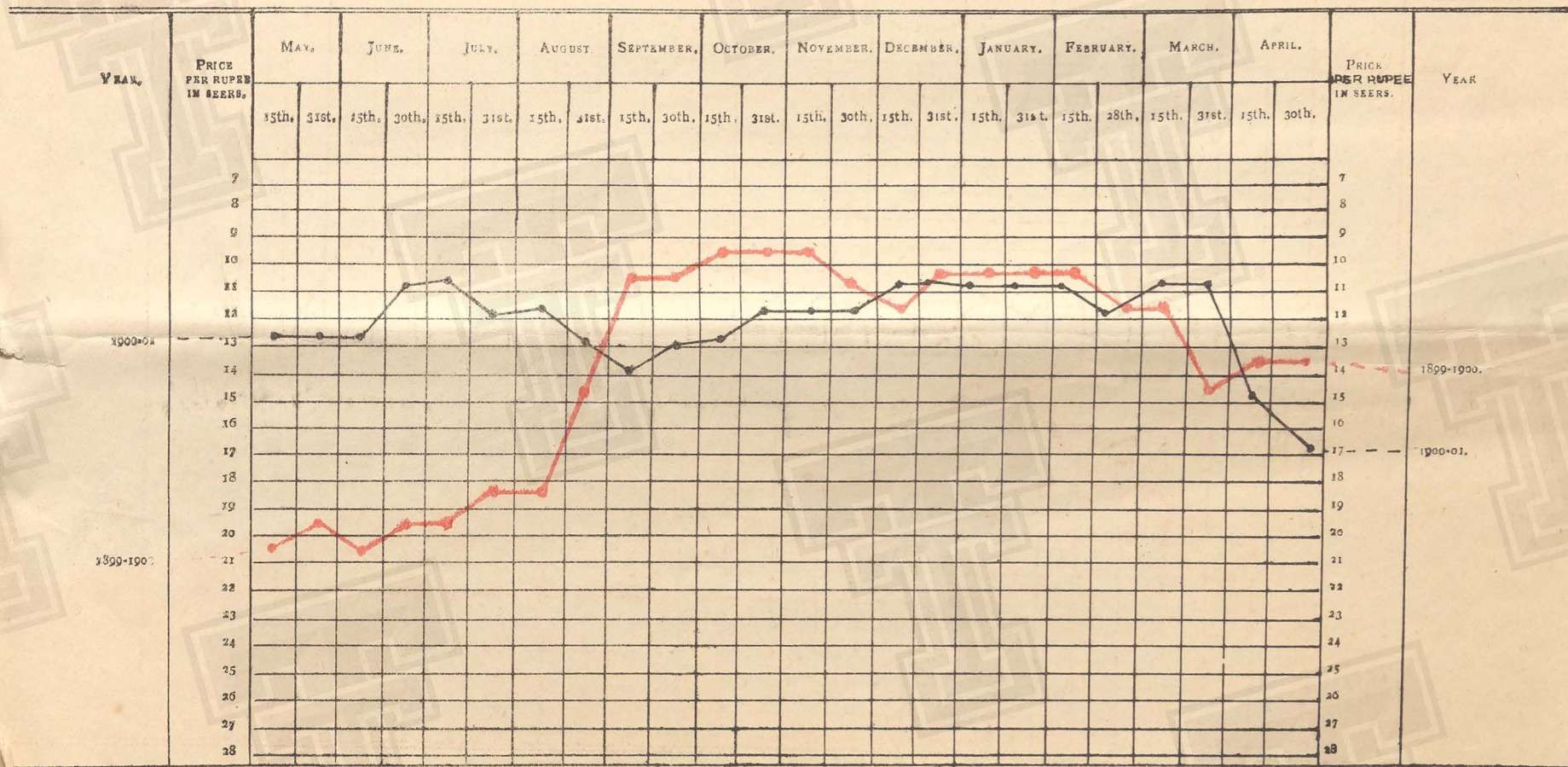
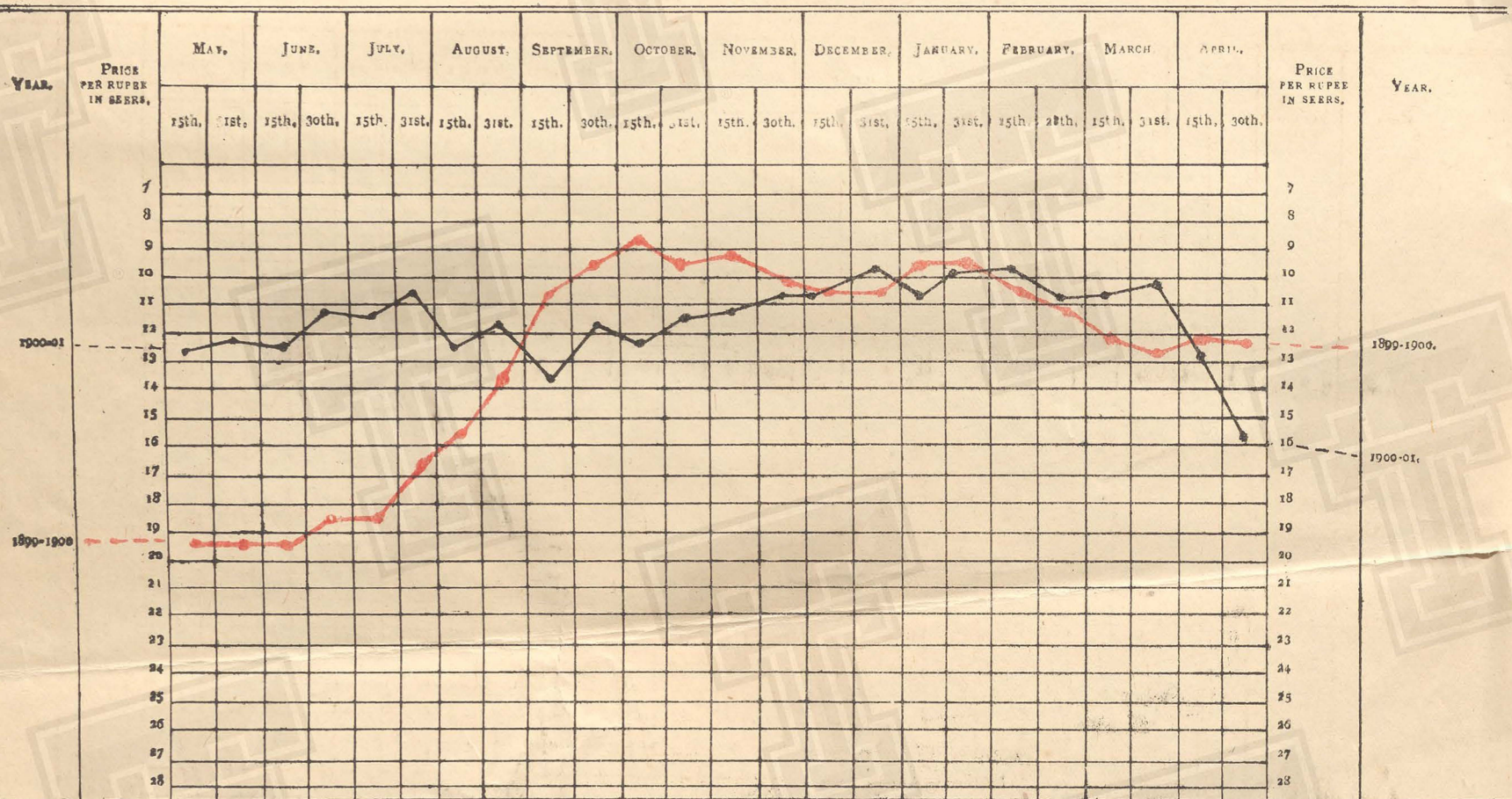


Diagram showing the Rise and Fall in Prices of Wheat during the years 1899-1900 and 1900-01.

FEROZEPORE DISTRICT.



DEPARTMENT OF AGRICULTURE AND TECHNICAL
INSTRUCTION FOR IRELAND.

CATCH CROPS.

BY

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CATCH CROPS.

By T. WIBBERLEY, Itinerant Instructor in Agriculture, Co. Limerick.

It is possible that the much debated problem regarding the profitableness or otherwise of tillage in Ireland will be solved eventually by farmers adopting a more intensive, but at the same time cheaper, system of cultivation.

Such a system must embrace the practice of catch cropping which aims at producing, in many cases, two and even three crops in the year, instead of one.

Catch cropping is of special importance to the dairy farmer, for by this system it is possible to increase materially the number of dairy stock carried on a given area. Indeed, did space permit, several instances could be quoted where farmers in County Limerick, who previously had practically the whole of their holdings under grass, have been able to double the number of live stock on the farm by adopting a complete system of catch cropping. The more stock a farm can carry, the greater the quantity of manure produced, with the result that the land can be maintained in a higher state of fertility.

At any period of the year, a milking cow, or, for that matter, any class of beast—greatly appreciates the succulent green feeding supplied by catch crops. In early spring, after a winter passed on dry feeding—often hay alone—green feeding serves the double purpose of food and a tonic to the newly calved dairy cow, and the farmer who had not previously seen the relish with which cattle partake of green catch crops at this period of the year cannot fail to be struck thereby. Again, in summer time cattle if so fed will milk better, and will only require about half the usual amount of pasture. If milking cows are kept indoors for part of the day during the summer months and fed on soiling crops, they will milk better and require much less pasture than under the ordinary system. They will also suffer less from the warble fly.

The quantity and quality of pasture grass deteriorates in autumn, and it is just at this season of the year that the price of butter-fat materially improves. A little rape, rye grass, etc., fed to spring or summer calved cows during the months of September, October and November, will usually stimulate a fresh flow of milk similar to that observed in spring when cows are changed from the stall to pasture. In the writer's opinion, winter dairying in County Limerick can seldom be carried on profitably unless winter catch crops are grown. It may be mentioned that this opinion is the result of six years' experience of growing catch crops on practically every variety of soil in the county. No part of the

work of the Limerick County Agricultural Committee has been watched with such keen interest by farmers, and the methods adopted on the catch crop demonstration plots have been carefully observed and copied. During the past season over 350 farmers grew catch crops in West Limerick alone. A few years ago it would have been impossible to find a single catch crop in the county, with the exception of a few isolated patches of rape in the mountainous districts bordering County Kerry.

Catch crops, according to the purpose for which they are intended, may be classified as :—

1. Spring Catch Crops.
2. Summer do.
3. Winter do.

SPRING CATCH CROPS.

Spring catch crops are usually sown on a lea oat stubble with the object of producing green food in early spring before pastures have made sufficient growth to carry cattle.

For early spring cutting, early sowing in autumn is imperative, and, in this connection, it may be mentioned that hardy varieties of oats are obtainable which, if sown in winter, will ripen from ten to twelve days earlier than the spring sown varieties. A difference of a week in the sowing of, say, hardy green turnips or rape may enable the crop to be cut three weeks earlier in spring, with the additional advantage that the subsequent crop can be sown quite as early as would be the case if the oat stubble had been left bare all winter.

It is important to use farmyard manure for autumn sown catch crops, especially for hardy green turnips and rape. The farmyard manure should be used in the long unrotted state, as in that condition it keeps the land open and warm during the winter months.

If farmyard manure is not available, or if a full quantity cannot be given to the crop, a mixture consisting of :—

- 3 parts superphosphate,
- 1 part sulphate of ammonia,
- 3 parts kainit,

sown at the rate of 5 to 7 cwt. per statute acre, may be used. No matter how much artificial manure be used, autumn sown catch crops will not be so productive or so early as they would were farmyard manure supplied.

Bearing this in mind, farmers would be well advised to use less dung on their ordinary tillage crops, supplementing the lighter

dressing with artificials ; or, a quantity of dung could be made by having a summer fodder crop and feeding cattle indoors during part of the summer.

The kind of catch crops most suitable for autumn sowing are rape, hardy green turnips, rye, and vetches.

Kind of Crop It is better to sow a little of each of the foregoing crops, no matter how small the area, rather than to sow the entire area with only one or perhaps two crops. By this means a continuous supply of feeding will be available in spring, whereas if, say, a considerable area of rye alone is sown, and cutting commences when the crop is about three feet high, part of the crop will become fibrous and unpalatable to stock before the cutting of the crop is completed.

Catch Crops after a Grain Crop.—Immediately the grain crop is cut, no time should be lost in getting a portion of the stubble sown with hardy green turnips and rape. Early sowing of these two crops is especially desirable, and they are seldom very successful if sown later than the first week of September. To facilitate the sowing of these two crops after a late harvest, the grain crop should be stooked or hand-stacked in such a manner as to leave a clear space of from one-half to one acre. Half of this area should be sown with hardy green turnips and the remaining half with rape.

If farmyard manure is used for these two crops, it should be carted on to the stubble and ploughed in. The land should then be reduced to a fine tilth with a spring tooth harrow, and finished with a light zig-zag harrow.

Seeding.—The seed can be scattered broadcast and rolled in. Both crops should be sown thinly, say, at the rate of about six or seven pounds of seed per statute acre. *Thick sowing of either hardy green turnips or rape tends to produce a weak growth unable to withstand severe frost*, or, if not affected by frost, the plants become stalky and hard.

To facilitate the even distribution of such a small quantity of seed, it is a good plan to mix the seed with fine earth, sand, or a little nitrate of soda to increase the bulk. A simple plan is to place the seed in a wide necked bottle, fitted with a cork through which a large goose quill, or a piece of tin tubing about quarter of an inch in diameter is passed. By walking at a moderate pace, shaking the bottle from side to side, and sowing about five feet wide at a time, just about 6 or 7 lbs. of seed per statute acre will be sown. If this plan is adopted, a little flour or lime-dust should be mixed with the seed, so that, in the event of the seed becoming clogged in the quill or tube, the sower will immediately notice the fact.

Hardy Green Turnips, it may be mentioned, are simply hybrid

turnips which are available for late sowing, and can withstand a cold temperature. Sown broadcast, the crop resembles rape, and may be cut with a scythe in the same manner. If sown in the same way as the ordinary swede, and thinned, a crop of bulbs is produced. Even when sown broadcast, small bulbs about the size of a large potato are formed, and, latterly, many farmers have adopted the plan of pulling the crop instead of mowing it, separating the tops from the bulbs and pulping the latter for stock feeding.

Under certain conditions, mentioned later, two cuttings of hardy green turnips may be obtained from one sowing.

Rape.—It has been disputed latterly whether there is any essential difference between what has been previously known as dwarf rape and giant rape. Whether there is any botanical difference is a matter for the botanist to determine, but there is the greatest difference between crops from rape seed obtained from different sources. What is at present regarded as dwarf rape gives, even on rich land, a miserable dwarfed crop suitable only for sheep-folding; whereas the giant variety with good cultivation often attains a height of over six feet, and has a leaf almost as large as that of a kale plant.

As previously mentioned, even giant rape grows with a very dwarfed appearance when sown thickly, or on very poor land. Giant rape is also known as Cole, Dutch or Broad-leaf Rape.

Rye and Vetches can be grown more successfully with artificial manures alone than hardy green turnips or giant rape. They can also be sown later than the two latter crops, and are generally sown on stubble land after the corn has been carted. The earlier they are sown, however, the earlier can the crop be cut in spring.

Both crops are broadcasted on the newly ploughed land and covered in, in precisely the same way as lea oats. As regards rye, 18 stone of seed per statute acre is suitable seeding. Giant Essex Rye is superior to the common winter variety for catch cropping, as it produces a larger amount of leafy foliage.

On light or fairly clean land, a second crop of rye, which may be allowed to ripen, can be obtained by grass harrowing the ground as soon as the first crop is cut and applying 5 to 7 cwt. per statute acre of the mixture of artificial manures previously mentioned.

Vetches.—There are two varieties, the Winter Vetch and the Spring Vetch. The winter variety should be used for autumn sowing, as the spring vetch is not sufficiently hardy to withstand frost.

The vetch sown for spring feeding should be mixed with rye or wheat: with rye if sown early, say during September, and with wheat if the sowing is delayed until October. A suitable seeding