

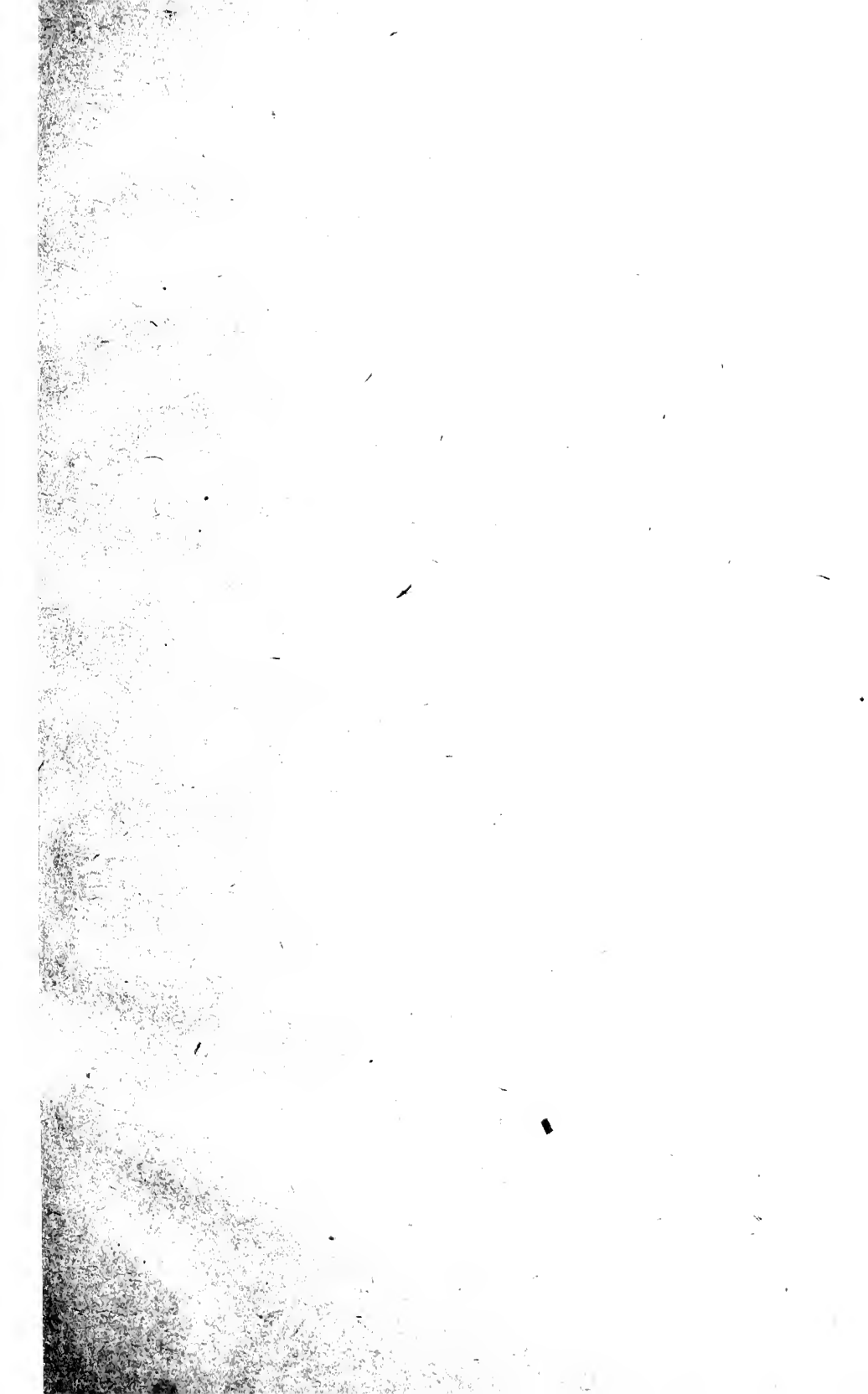
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# A TRIBUTE

TO

## LEVI STOCKBRIDGE,

PROFESSOR OF AGRICULTURE IN THE MASSACHUSETTS AGRICULTURAL  
COLLEGE FROM 1871 TO 1882, AND PRESIDENT OF  
THE COLLEGE FROM 1880 TO 1882.

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BY WILLIAM H. BOWKER  
OF THE CLASS OF '71.

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READ AT THE MEMORIAL EXERCISES AT COMMENCEMENT.  
AMHERST, JUNE 15, 1904.

LOAN STACK

GIFT

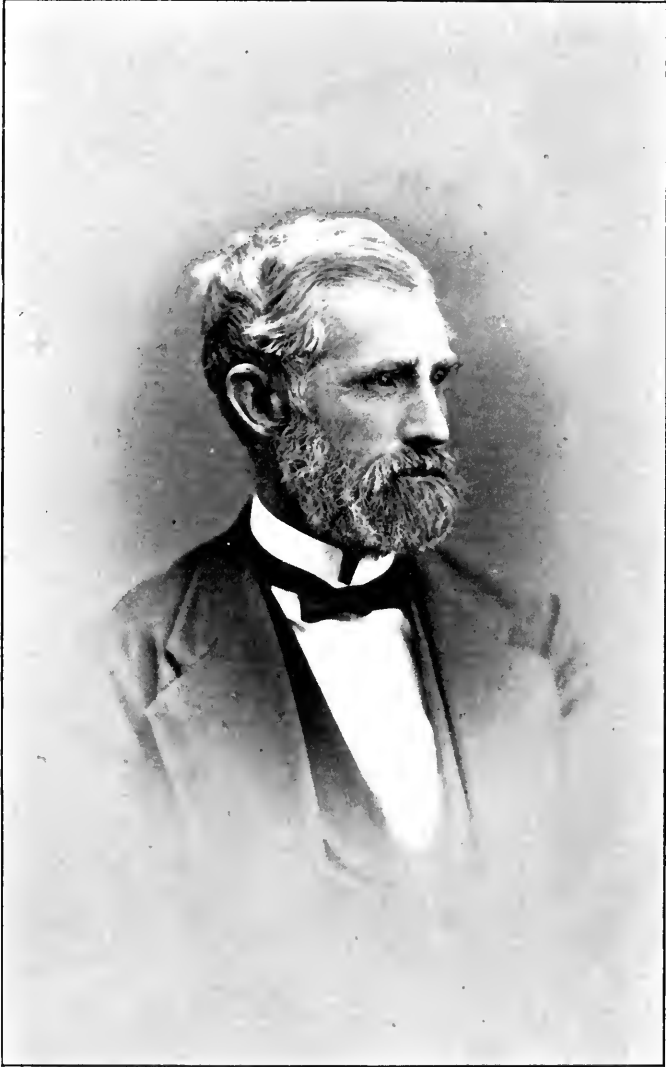
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LEVI STOCKBRIDGE.



# A TRIBUTE

TO

## LEVI STOCKBRIDGE,

BY

*WILLIAM H. BOWKER, of the Class of '71.*

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Read at the Memorial Exercises at Commencement, Amherst, June 15, 1904.

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Professor Stockbridge was very near, very dear, and very necessary to "his boys;" and he counted us all as "his boys," whether we had just entered the College or had grown weary and gray in life's battle. He was a father to many and a counsellor to all. We cannot think of him in an impersonal way, but always in the relationship of friend and comrade—one to whom we could take our troubles—one who would meet us on our own plane, whether we came from the farm or from the city. He had been a farmer's boy himself—he knew the boy's environment, his habits of thought and his ambitions, and therefore could meet him on a common ground; yet he was equally interested and successful in dealing with the city-bred boy. He loved young manhood from every station of life. To him all boys possessed great possibilities, and he felt it incumbent upon him to find these out and direct them into proper channels.

He came of the purest New England stock, of a large and devout family, whose parents, like so many others, were ambitious for their children, but not able to give each one a college education. In the Stockbridge family it fell to the lot of the oldest brother to enter Amherst college. Levi, no doubt, felt that it was unfortunate, if not

wrong, that he should not have an equal chance, but very likely he never expressed regret or displeasure to his parents. He was one who never complained, and accepted his lot with the duty it entailed. He did not, however, let the inability of his parents to send him to college daunt his courage or dampen his ambition, for when his brother was taking his course in the old college, Levi was studying the same books at home, and attending many of the lectures, particularly in chemistry, that his brother studied at Amherst. Thus, while he had little personal contact with the teacher and the professor—so important an influence in moulding young life—he was pursuing, as far as he could, many of the studies which so admirably fitted him for his life work. Very likely at that time he had no thought of becoming a teacher, much less a moulder of character in an institution new in the field of education. Rather, he was fitting himself to be a good citizen and a good farmer. He saw, as but few others did at that time, the wide field and the great need of the educated farmer. He had read the works of Liebig, the founder of agricultural chemistry. The experiments of Lawes and Gilbert, in a field which he afterwards occupied and broadened, were not unknown to him. He was familiar with the teachings of Jethro Trull, and I am sure, with his enthusiastic nature, he must have enjoyed the writings of Charles Downing, that poet of the orchard and philosopher of the garden. As a young man, he kept in touch with the proceedings which led up to the founding of the Board of Agriculture, and finally of this College. He knew and respected the work of Marshall P. Wilder, the philanthropic merchant, and Simon Brown, the talented agricultural editor. Just who was his prototype I do not know, but he must have been of a high order. Perhaps he has left somewhere a record of the man who exercised the greatest influence over him. There is rarely a man who cannot point to some one who, earlier or later in life, has helped to shape his course, either for good or for evil. We older men, in our contact with young men, sometimes forget our unconscious influence over them, but the teacher and the professor in a college should never do so. Professor Stockbridge always remembered his relationship to the student body, and yet he was never stilted or unapproachable. Underneath his quaint, humorous speech and sometimes droll ways, there was a dignity and firmness of manner which the boys felt and respected.

No teacher in my day preserved better order in the class room, and no one was more successful with his classes.

We have heard to-day, or shall hear, of his work in connection with the establishment and upbuilding of this College, and of his scientific and practical work in the field of agriculture, but after all, I feel, as you all must feel, that his most beneficent influence, his greatest achievement, was his personal, close relationship to the student body of this institution ; for while he was a natural instructor, clear, brilliant and enthusiastic, yet he was greatest and best as friend and adviser. The College was extremely fortunate in having at the start such a man—healthful, helpful, courageous, buoyant and optimistic, but always possessed of good judgment. He was sunny, hopeful, sane. In all my thirty-seven years' acquaintance with him I never saw him cast down.

Many of us found him a helpful friend in a substantial way. I do not know how many young men owe the completion of their college course to his financial aid. I fear many would not have gone through this institution if he had not helped them. We can all see him now, at least some of us can, when we were strapped—and what young man does not get in that fix now and then?—we can see him, after he had asked us a few leading questions, put in such a way as never to disclose his feelings but always ours—he was as keen as the keenest lawyer—we can see him pull out his old leather wallet from a pair of ungainly-fitting trousers, leisurely unstrap it, and hand out a five or a ten dollar bill without further comment. How relieved we were! How the clouds lifted, and how life took on a new hope for us! I sometimes think he took a secret delight in our temporary discomfiture, and in our manifest pleasure when the ordeal was over, for the twinkle of his eye and the smile of his lip were very expressive and will ever be remembered by his numerous boys. I wonder if he always kept account of the aid which he gave. I hope and believe that the boys did, and returned it with interest; but whether that was the case or not, he enjoyed helping them, for he had been there himself. Moreover, he had been taught that it was good to cast his bread upon the waters, knowing that it would come back to some one, if not to him, in God's own way and time. He wanted no young man to fail of going through his beloved institution for lack of funds ; and yet he believed in every man helping himself. If he had been a millionaire he would not have been lavish in his aid—he

would have assisted only those who assisted themselves. He was a keen reader of character. He sifted the wheat from the chaff, and no doubt many a boy stayed in college and many a boy went away because of the advice which he gave him, in that kindly way which never offended. Probably there was not in this institution during his day a student who did not at some time consult him. Thus he helped to mould as best he knew—and for the best, as I believe—the life of every man who came under his influence.

What a work he undertook! It must be borne in mind that when he came from the Hadley farm to take charge of the College farm and to superintend the erection of the first buildings, it was practically the first agricultural college to be started in this country. The field was absolutely new; there was not a model to go by. The buildings were to be built and arranged not only for academic but for practical training. Again, when he undertook instruction in agriculture there was not another chair of agriculture in the country, and there was no one to whom he could turn for advice. He had to blaze the way, without books and without chart. And how well he did it! His lectures were to me the most interesting of any I attended. They were clear, concise and always practical. They could not be otherwise, for he possessed a clear, logical mind and a terse form of speech. His English was exceptionally good.

He had an original and inventive mind. He saw, as others did not see, the necessity of taking what chemists, botanists, geologists and other scientists had worked out, and of applying it to practical ends; stripping it, as far as possible, of all technicality, and making it plain and simple, not only to the farmer's boy here in the College but to the father at home. He popularized and made assimilable the teachings of all the sciences related to agriculture, but he lectured to a larger audience than the students of the College—he spoke to the farmers of the land.

It is claimed that agriculture is not a science, but an art—that there is no need of a chair of agriculture in any college; and I sometimes think that it is true, for agriculture is made up of so many collateral branches. Stockbridge realized this, and by his great insight and practical training was able to glean from all sources of knowledge that which was essential to the upbuilding of agriculture. As he taught and exemplified agriculture in his day, he demonstrated the value of the chair of agriculture in all our agricultural colleges.

He ploughed and sowed for all of them, and all of them are reaping the fruits of his labor.

May I be somewhat personal, for I take it that personal reminiscences will be interesting at this time? I came here a green lad from a small farm in northern Worcester county, and I shall not forget my first meeting with Professor Stockbridge. I can see him standing on what is now the campus, superintending some of the finishing touches to the buildings, on which the paint was not dry—a tall, spare man, dressed in a rough suit of clothes and a slouch hat, with sandy hair and beard slightly streaked with grey, with keen, kindly eyes looking out from beneath shaggy eyebrows—a striking character in the full vigor of manhood. He was thirty-seven years old when he began the work of his life, and eighty-four when he died. As you may imagine, he was far from my picture of a college professor, who should have been dressed in black clothes, with gray beard and gold-bowed spectacles, and of whom I expected to stand in awe. We were all standing at that time in a fifty-acre field surrounded with Virginia fences and filled in here and there with corn fields and apple trees and tumble-down tobacco sheds. An incongruous picture it made, with the modern buildings towering above it all. But the impression which he made upon me was that he was one of our kind—an approachable man, who could drive a yoke of oxen or preside at a town meeting with equal ease. Boys get curious impressions, but I know it went through my mind that if I got homesick—which I did—I could go to him and talk it over—which I did not do, however, because it is a boy's way to bluff it through.

The next recollection I have of him is in the management of a class of sixty unruly chaps from farm, city and village, in our first lesson in husking out a field of corn. It was a bright October afternoon, and although I was brought up amid beautiful scenery I shall never forget this picture and its superb setting. It had its healthful influence on us, as it must have had on those who have followed us. Neither shall I forget his masterful and tactful way of handling us; and just here let me say that I think his tact and judgment were, after all, his greatest gifts, which he had occasion many times afterwards to bring successfully into play in his management of the student body in manual training, then a new departure in college education. We must have been a sore problem to him, for it should be remembered that we were the pioneer class—the experimental class—and he and

we were green together. The harvesting of this corn crop was a splendid object lesson to us in the management of men and teams and in the selection of seed, but I think it also opened his eyes to some things.

I next remember him taking a class into the hay field to learn how to make hay, to run a mowing machine and to use the scythe in trimming out. Some of us knew how to do it, for we had come from the hay field, but there were some from the city who had never seen a scythe—at least, had never swung one. When Herrick, a beaming boy from the city of Lawrence, looking through big, round, rimless glasses, started in with his scythe, everybody else fled for fear of accident. Stockbridge said, "Keep your heel down, Herrick!" and Herrick, not knowing what he meant, plunged away, stamping his heel into the wet soil and running the point of his scythe into the ground, the rest of us laughing at him. Finally, "Old Prof," with infinite patience, stepped up to him and said, "Young man, it is not the heel of your boot, but the *shank* or the *heel* of the scythe which you must keep to the ground if you would cut a swath in this life." Young Herrick was cut off by the great reaper too early to demonstrate the teachings of Stockbridge.

The next time I remember him as standing out prominently, to us at least, was in the fall of '68, when Grant was first elected to the presidency of the United States. When the news of the election came to town, a glorification meeting was held to celebrate the victory. All the students of both colleges, of whatever political faith, joined in a procession and marched around to the professors' houses, both of the old and the new college, calling each man out for a speech. We began down town, and were first addressed by President Stearns, Professors Seelye, Tyler and I think by dear old Professor Snell, one of the sunniest men I ever met; then up to President Clark's house, where he gave us a rousing reception and a good speech. Finally, we lined up in front of "Prof. Stock's" house. Stockbridge expected us, and evidently had been preparing something for us. I can see him now, coming down the rickety stairs of his little old woodshed office and deliberately walking up to the doorstep in front of the house. I cannot recall his language, but I remember his eulogy of Lincoln, and then of Grant, who had been Lincoln's mainstay, closing with a splendid outline of the future for "us boys," as he called us, who were then coming on the stage, with

a plea for good citizenship and patriotism, as exemplified by these two great Americans. It was voted by the students of both colleges to be the best speech of the evening.

Shall we ever forget him as a writer and public speaker? He was clear, earnest, often brilliant, and always sensible; but if he happened to be pleading for his beloved College or for the cause of agriculture, then it was that he rose to the occasion, convincing and unanswerable!

May I again be personal? Perhaps no one has had closer business relations with Professor Stockbridge than I during the past thirty years. I came to know him intimately in a business way. I touched him on the money side, and it is said that if one would know a man's true character, one must have financial transactions with him. In all my thirty years' association with Professor Stockbridge I never found him sharp or underhanded. He always took a broad, clear, business-like view of every situation, and was fair and liberal in his dealings. When he placed the Stockbridge formulas in my hands—I was then a young man of twenty-five—I could but feel that it was a mark of confidence, for there were large and rich concerns in New York that had applied to him for the opportunity to manufacture them under his name. It was a gray, cold December day when the trade was closed in his woodshed office. I can see him now, with his long legs stretched out, toasting his shins at the little old broken-down stove which would hold only a stick at a time, and I remember wondering how he ever got time to write his lectures and keep that stove going. When he was about to sign the agreement, he remarked: "I know you; you have been one of my boys and one of our College family, and I think I'll take my chances with you." I hope he never regretted the step, and I think he did not, for he voluntarily remained a director in our company, in which he took a great interest, to the day of his death. And let me say, in passing, that he always insisted upon our business being done on a high plane, and was as jealous of the good report of the company as of the formulas which bore his name. He set a high standard and expected us to live up to it.

It will be well to record here that the first money received by Professor Stockbridge in royalties for the use of his name (his formulas were given to the world for anybody to use) was devoted to experimental work at Amherst, which practically laid the foundation

for the first experiment station to be established in this country in connection with an agricultural college, and the second station to be incorporated in the United States. The first was incorporated by Connecticut at New Haven, and the second by Massachusetts at Amherst.

These two stations were afterwards consolidated with the government stations, and along with forty-two others, one in each state, were endowed under the Hatch bill, and are now known as the Hatch Experiment Stations. But to Johnson and Atwater, of Connecticut, among the greatest of living agricultural chemists, and to Stockbridge and Clark, of Massachusetts, the wisest of practical educators, belongs the credit of inaugurating this great educational movement. Out of it, also, has grown the enlarged and vigorous Department of Agriculture at Washington, which in connection with the stations and the agricultural colleges is doing yeoman's service for the advancement of knowledge. These stations and the agricultural colleges, each supplementing the other—the one to develop men and the other to develop methods—may well be considered the renaissance of our new agriculture.

I want to mention another personal recollection. In one of his lectures—or talks, as he liked to call them—the question of the large personal fortunes that were beginning to pile up was under discussion. He, as you all know, was very democratic in his feelings, inclined to side with the under dog, whether the dog was right or wrong. He regretted the advantage which the crafty and unscrupulous were taking of the people and of the laws of the people, in amassing wealth in *lawful*, but, as he thought, *improper* ways. And I remember his flashing out one day with this remark :

“No man has a right to more than a stated amount of property, a million if you please. If he amasses more than the allotted amount he should yield up the excess to the state. The prizes should be divided more equally and distributed more widely.”

When asked how he would accomplish it, he replied :

“Through the probate court, through which all estates must pass sooner or later, or by some other effective means.”

I suppose he meant that if a man's estate was found by official appraisal to be more than the allotted amount he would have the excess pass to the government, and thus he would hope to check



greed and selfish ambition. This remark was made more than thirty years ago, and he lived to see, in the inheritance tax, a partial step in that direction. He probably felt then, as many have come to feel since, that the game should be played more fairly, and, if necessary, that the rules of the game should be modified; that the prizes, as in schools and universities, should be as many as possible, but limited in size—a maximum *cum laude*, the highest with praise—beyond which no one should go. And why not? If our universities find it wise to fix a maximum prize, and our boys in their games find it necessary to place a handicap on the strongest player, to equalize conditions and to make the game fairer and more interesting, why not, in the game of life, have some kind of bar to the crafty and unscrupulous, to the end that the prizes shall be more fairly divided and more widely distributed? Stockbridge's sympathies went out to the weak, and if he had been born in this century I believe he would have become, in the best sense of the word, a socialist. He abhorred a plutocracy, and believed in every man having a fair chance.

You all know how useful and influential he was in the early years of the College. I wonder if you know how many times, when it was without friends and without funds to pay current expenses, he raised the money at the local bank on his own notes, or on the College notes endorsed by himself. I remember a bank friend of his taking him to task for doing it, saying that if he had to pay the notes it would ruin him. Stockbridge's reply was prophetic:

“Oh, I am not afraid! Never you worry! The state of Massachusetts has entered into a contract with the United States government to maintain this institution, and the State of Massachusetts will never go back on her contract. What is more, some day she will see the error of her way, and will come to the rescue of this institution and do all that may reasonably be asked of her. I tell you, it is going to be a success!”

We have lived—and, what is more gratifying, he lived—to see that remark come true. Not only did the state honor the paper which he endorsed, but it has given thousands upon thousands of dollars since then, and will give, as we require it, all that we may need for the development of this institution. It stands here to-day a monument to Levi Stockbridge as much as to any other man in Massachusetts.

Let us hope that some day there will be erected on the campus a statue to his memory, or, better still, a building which shall be known as "Stockbridge Hall," for the agricultural department, in which shall be placed a tablet, stating in simple terms what he did for the College and for the young men who came under his beneficent influence. The impetus and the stimulus which he gave to our lives by his splendid manhood and buoyant, hopeful outlook on life, have left their imprint upon us all, and are an inheritance which we shall hand on to those who come after us. The bright, cheery boy from the Hadley farm, self-taught, lives not only in this institution, but in the lives and character of hundreds of students who remember him and ever will remember him as "dear old Prof. Stock," whom they all loved.

If I were asked what was Stockbridge's greatest contribution to agriculture, I should say that it was not his formulas for crop feeding by which he is so widely known; for, useful as these were, they were but stepping stones to a better knowledge of the object and use of fertilizers. His greatest contribution to agriculture, as it seems to me, was his new conception of the office of fertility in farm economy. Up to the time of the publication of the Stockbridge formulas, the practice had been to *manure the soil* in order to restore lost fertility and to supply deficiencies in the soil, as ascertained by a chemical or crop analysis of the soil. Stockbridge saw that this method was not a practical solution of the problem, for neither chemical nor crop analysis of the soil could be relied upon as a true guide to its enrichment. The chemist disclosed too much that was misleading and the crop too little that was conclusive. But, what is more to the point, Stockbridge saw that we had taken hold of the problem at the wrong end. It was not the soil, but the crop, that we should first consider. We should study it and its needs, and supply it, as far as we were able, with the necessary elements of plant nutrition by the use of properly balanced manures. In a word, he turned from the inert soil, which could not answer, to the living crop, which could, and put this question to it:

"What shall I supply *you* in excess of what you may obtain from the soil or air by your own habits and conditions of growth to make you a perfect and profitable crop?"

On the other hand the farmer was asking him :

“What shall I use to produce profitable crops—how much and in what form?”

Starting then from the crop, with the farmer's question ever spurring him on and with such data as he could find, he worked out his well known formulas, which were published broadcast in 1876. And let me say here that besides being published in many agricultural papers and reports more than half a million pamphlets containing them were distributed.

He did not claim that his formulas were infallible, for he anticipated and announced, what we soon discovered in practice, that they would need to be modified, as experience should point the way. They served, however, a greater purpose even than Stockbridge dreamed at the time—they centered our thought and our study on the crop. From that time on we discussed plant food and not soil food—plant feeding instead of soil manuring. “Feed the crop rather than the soil,” was a frequent expression at this time.

It is well to observe here that crop formulas were not new. Ville and others had published various sets. The Stockbridge formulas, however, were unique in this: that they were based not alone on the analysis of the crop, but on its power of absorption from all the sources of fertility—from soil, air and water. Thus Stockbridge boldly prescribed :

“To produce fifty bushels of shelled corn per acre (without any stable manure) and its natural proportion of stover, *more* than the natural yield of the land, apply so many pounds each of nitrogen, potash and phosphoric acid. Or to produce a stated quantity of tobacco leaf of the desired color and texture, apply a stated quantity of plant food elements, preferably in the form of sulphates and nitrates.”

Here then, for the first time, a definite way was prescribed to attain a definite object. It was a startling proposition, and, as might be expected, it brought ridicule from many quarters, but Stockbridge did not allow that to disturb him. He knew that the commercial farmer needed a tangible starting point. He knew that to consider the needs of the crop, the living thing, both as to amount and kind of plant food, rather than the needs of the soil, an unknown and unknowable quantity, was not only a common sense way of meeting the problem of plant nutrition, but a very direct way of helping the farmer

out of the quagmire of doubt. The formulas might not be accurate; in some cases they might supply excessive amounts of plant food elements and apparently be very wasteful, yet he believed that in the end it was better economy to apply too much and *insure a crop*, than use too little and *lose a crop*. Nevertheless, as Professor Stockbridge anticipated would be the case, the fertilizers based on his formulas were modified from time to time as we gained light, chiefly by the reduction of nitrogen and the increase of phosphoric acid, as it was found that many crops were able to gather from natural sources, through bacterial action or otherwise, some part of the required nitrogen, and that an excess of available phosphoric acid would hasten maturity. It was also found that to supply the full complement of nitrogen in addition to what the crop would assimilate for itself tended in many cases to produce an unbalanced growth; yet, on the other hand, it was found that in some cases, especially where a forced growth or a tender leaf was required, an excess of nitrogen was desirable. Thus it will be seen that the crop was both the starting and the objective point. Not only its chemical needs, but its habits and conditions of growth, the object for which it was grown, and its market qualities, were all factors which influenced the composition or modification of the fertilizers; and the same factors are as potent to-day. Since, then, it was the crop that chiefly concerned Professor Stockbridge, how natural and sensible was his question: "What shall I supply you to make you a perfect and profitable crop?"

Let us now consider for a moment another phase of the subject, namely, the potential fertility of the soil, or "the natural yield," to which Professor Stockbridge frequently referred. It has been known for a long time that practically all tillable soils are rich in plant food elements, and yet many of them are barren, and most of them will not produce profitable crops without the aid of manure or fertilizer.\*

\* Professor Frederick D. Chester, of Delaware, states in an able bulletin recently published:

"An average of the results of 49 analyses of the typical soils of the United States showed per acre for the first eight inches of surface 2600 pounds of nitrogen, 4800 pounds of phosphoric acid and 13,400 pounds of potash. The average yield of wheat in the United States is 14 bushels per acre. Such a crop will remove 29.7 pounds of nitrogen, 9.5 pounds of phosphoric acid and 13.7 pounds of potash.

"Now, if all the potential nitrogen, phosphoric acid and potash could be rendered available, there is present in such an average soil, in the first eight inches, enough nitrogen to last 90 years, enough phosphoric acid for 500 years, and enough potash for 1000 years.

"This is what is meant by potential soil fertility, and yet such a soil possessing this same high potential fertility may, under certain conditions, be so actually barren of results to the farmer as to lead him to believe it absolutely devoid of plant food."

In a word, potential fertility represents plant food which is so tightly locked up that it is not available for present needs, and becomes available only through the process of decay and disintegration, which is too slow to meet the requirements of the commercial farmer. Stockbridge realized the situation, but instead of asking the soil how much of the potential fertility could be depended upon for each crop (a question which will never be satisfactorily answered), he went to the crop and asked it how much it was necessary to supply for a stated yield over and above the natural yield of the land. In all cases he found it to be a very small quantity. For the corn crop not over 200 pounds of nitrogen, potash and phosphoric acid was necessary, which the crop would return fifty fold (at least five tons in stalk and grain)—so little to produce so much—and yet if this little quantity of 200 pounds was not supplied the crop would be a failure.

It was this little essential balance of available plant food which stood between success and failure that concerned Professor Stockbridge, as it concerns every farmer to-day. Although it was small, he did not deem it wise to depend upon the potential fertility of the soil to supply it, or even any considerable part of it. For the commercial farmer it was too risky and uncertain. To insure a crop, as far as one was able, was a cardinal principle with him; not to do it was in his eyes almost a crime. But he felt that all these things would right themselves as we came to know more about farm crops and their environment.

As bearing on the economy of his system of plant feeding, I want to quote here one of his apt illustrations. He said in effect:

“In a sense the farmer is a manufacturer and the soil is his machine, into which he puts plant food, and out of which, by the aid of Nature and his own efforts, he takes his product at harvest time. If the soil machine is a good one, so much the better. If it has a balance of crop-producing power to its credit, let us preserve that balance for an emergency. Let us not draw on it for present needs.”

He had no patience with the so-called single-element doctrine, which depends for its success on the potential fertility—no patience with the farmer who was trying to find out for himself if he could leave out any one of the three leading elements of plant nutrition (nitrogen, potash and phosphoric acid), or how little of each he could get along with. That was a proper subject for the scientific worker

to investigate, but until we knew more about it the practical farmer, who had his living to make and bills to pay, should not tinker with it. To Stockbridge it meant, in the end, improvident farming. At best, the farmer had to take great chances, especially with the weather—the largest factor in crop raising, over which he had no control; but he should take no chances with the things which he could control. Among these were the amount and kind of manure which he applied to his crops. Thus, if he hoped for a stated crop he should at least fertilize intelligently for that crop. For the man who was dependent on his crops any other course was unwise. Moreover, any other course would leave the soil machine in a poorer condition than he found it. Broadly speaking, to encourage him to take out more than he put back was not only bad economy, but bad morals, and should be discouraged, for in the end it would lead to crop bankruptcy.

It is needless to say that the farmers appreciated this bold course. As Stockbridge put it, they jumped on his wagon before he was ready to start. He was indeed their prophet, who led them out of the wilderness of speculation into the light of practical methods. As might be expected, this new conception of the use of chemical manures—or plant food, as he liked to call it—not only revolutionized all our notions of fertilization, but the entire fertilizer business as well. It immediately raised the standard of commercial manures from ordinary superphosphates, containing no potash, to “complete manures,” many of them rich in potash. Special fertilizers for special crops or classes of crops were brought out by various makers, and the business received a new impetus and a new recognition in the community. It was put on a sound footing, from which it can never be displaced.

As in stock feeding we chiefly concern ourselves with the study of the animal and its needs, so in plant feeding we must make an intelligent study of the needs of the living crop. As we know how to feed the cow for milk or beef, so we must know how to feed the plant for leaf or seed. Not only must we know the amount of plant food to be supplied, based on crop requirements, but the form and association of the different elements must be considered; and in the study of this problem we must also continue to study the soil, its potential fertility, its physical and chemical characteristics, and particularly the lower orders of life which it contains, the bacteria and

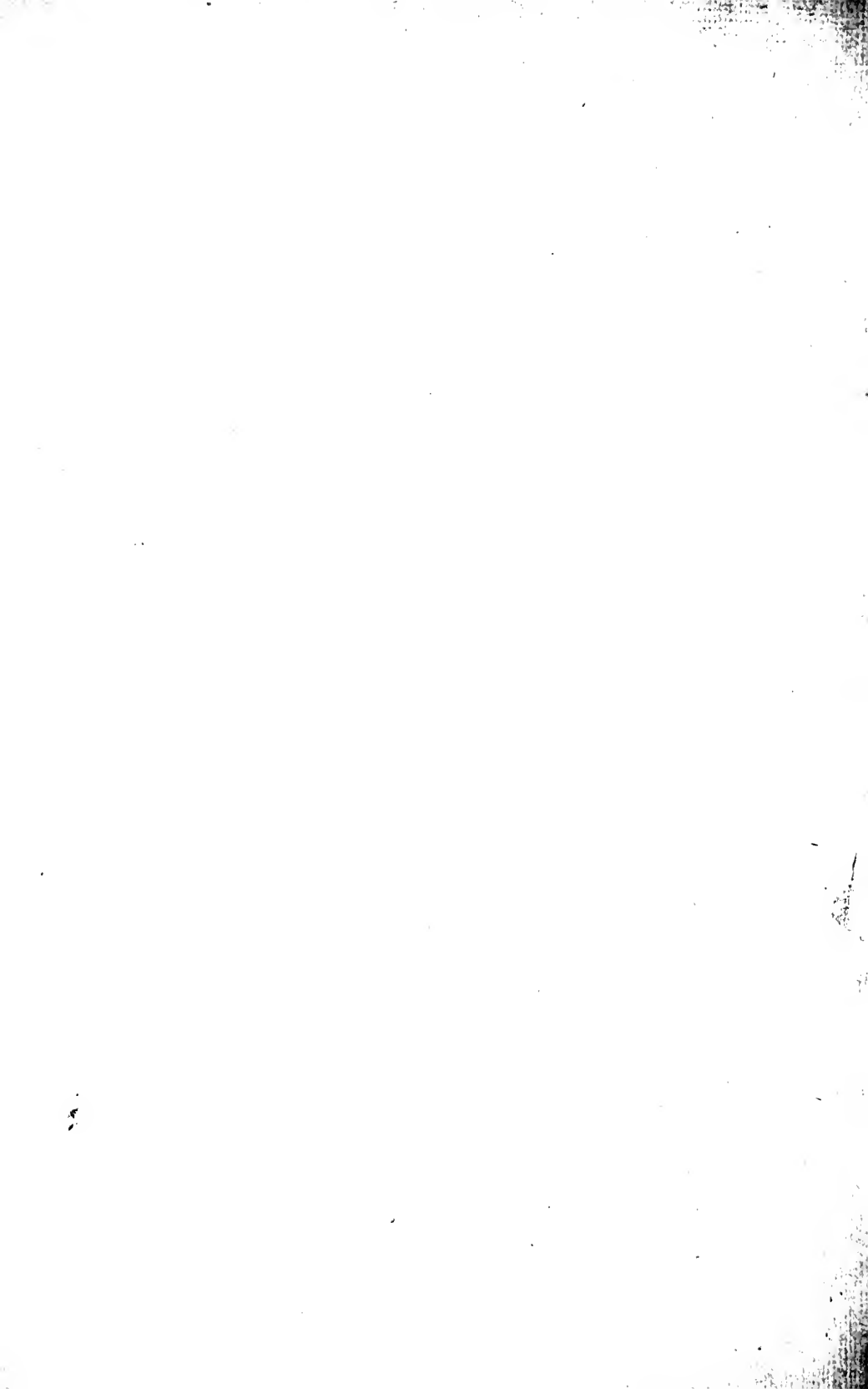
other unseen forces. In short, we must continue our study of all the sources and forces of fertility, to the end that we may know what each contributes to the upbuilding, not necessarily of the soil, but of the crop life above the soil. Thus did Stockbridge teach and practice.

As Stevenson made practical the discovery of Watts, as Singer improved upon the invention of Howe, so Stockbridge took the teachings of Liebig and Johnson, the tables of Wolf, and the experiments of Goessmann, Atwater and Sturtevant, and applied them to practical and useful ends. While the system of plant feeding which he employed, or perhaps I should say the method of application as prescribed in his formulas, did not appeal to the scientific mind in the beginning, it did appeal to the practical farmers, for it met their needs as no other method ever before had done. As good practice and good science must agree in the end, so I believe the scientific world is coming to agree with the practical farmer that the system and the method of application for which Stockbridge stood and labored is as truly scientific as it is thoroughly practical, and to accord him a high place among the workers for the advancement of scientific as well as practical husbandry.

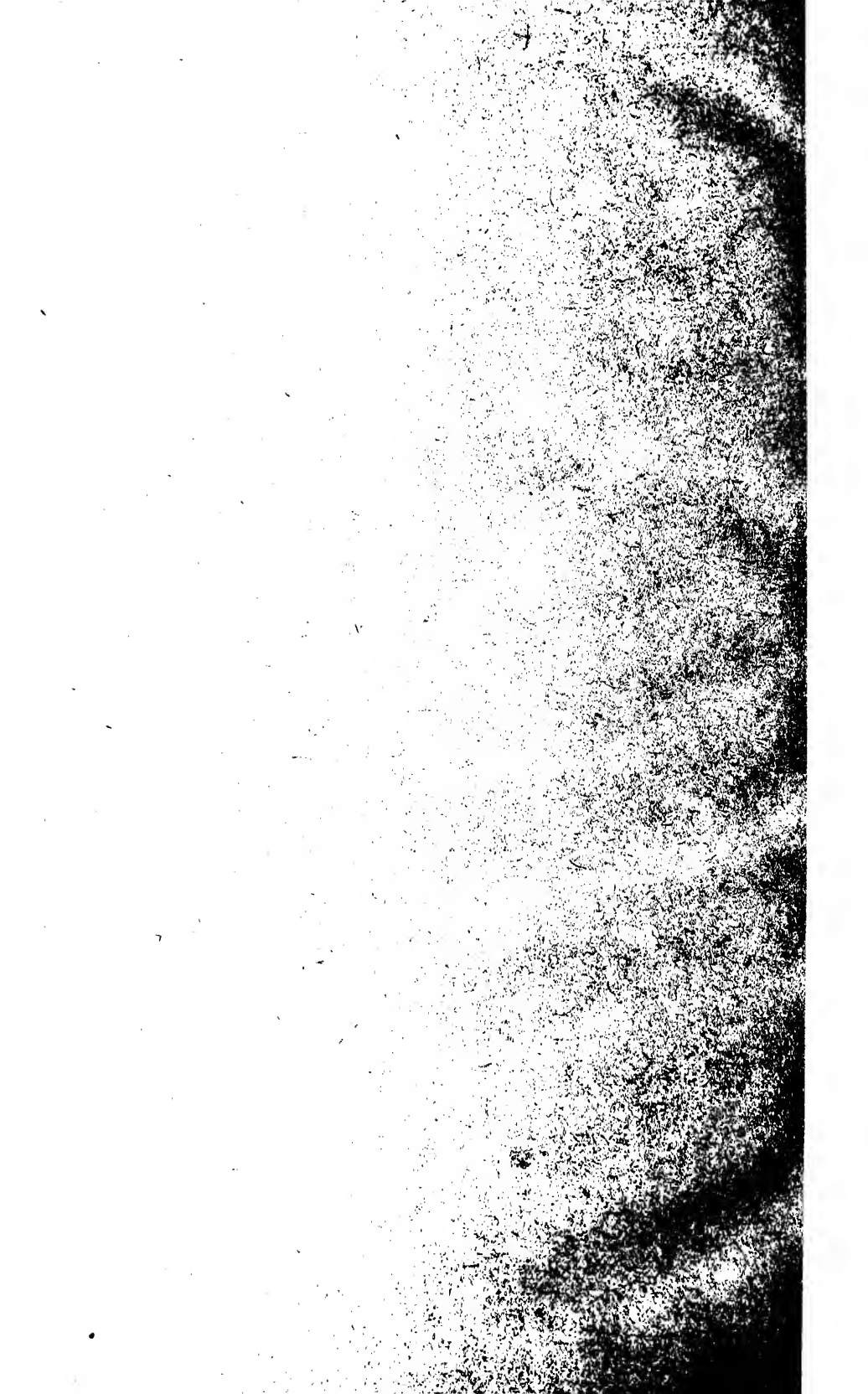












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