

Education & Agriculture

A HISTORY OF THE NEW YORK STATE
COLLEGE OF AGRICULTURE AT
CORNELL UNIVERSITY

by Gould P. Colman

[Part 1: Chapters 1-5]

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CORNELL UNIVERSITY

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Preface

A RECORD of history provides the chronology of events that lead to the present. As it is reviewed, we recognize our great debt of gratitude to the men and women in the Empire State who through ingenuity, enthusiasm, sacrifice, and accomplishment have brought agriculture forward from colonial times. With the continuous changes and adjustments that have taken place through the years, agriculture today remains a strong, dynamic industry, important in the State's economy.

The College of Agriculture at Cornell University reveals through this history its contributions of nearly a century of continuous service. Ezra Cornell's desire that agriculture be among the significant fields of knowledge in his new university, continues to be recognized. Mr. Cornell envisioned a more efficient agriculture in America, and in addition to the passing of practices from father to son, it was his desire that the college classrooms contribute to agricultural improvement. Today's modern agricultural practices bear little resemblance to those of a century ago. This is in large part a tribute to Ezra Cornell's concept that educators and scientists should serve the interests of agriculture. It is this concept of service which remains our objective today.

Cornell University, as the private land-grant university for New York, has worked in partnership with the State of New York through long years of its history. In 1904, through a legislative act, the College of Agriculture was supported by New York State and has since been a contract college under the administration of Cornell University. This strong relationship has provided the fundamental support for the development of much of the program since that time. Farm organizations and others have been generous in their interest and support of the work of the College. Its efforts to meet the needs of the people in the State has been characteristic of the New York State College of Agriculture from the beginning. This teamwork

PREFACE

between the State and the University has worked for mutual good.

Much has been accomplished in our first century. The College of Agriculture recognizes its broad responsibilities in the fields of teaching, research, extension, and international agricultural development. Today the broadened concept of agriculture to include the commercial farm and the host of allied industries that provide goods and services, gives us an expanding opportunity, as well as responsibility. The great strength that agriculture assumes in national well being is becoming increasingly important in the concept of world peace.

Through a strong program, oriented toward the training of well qualified men and women to work in the broadening fields of biological, social, and physical sciences, and the related technology built upon them, we hope that the College may continue to play an important role in the future developments in agriculture. The breadth of this service reaches all of our citizens. We are a part of the greater effort which characterizes the cooperation among many interested agencies working for the continuing benefit of modern agriculture.



CHARLES E. PALM

Dean

College of Agriculture

Author's Notes and Acknowledgements

"HISTORY is valuable," Liberty Hyde Bailey once declared, "not because it affords us certain isolated or interesting facts, but because it enables us to discover the gradual unfolding of life or ideas, to correlate any movement with the time or epoch in which it occurred, and to forecast something of its future trend or destiny." This statement, which Bailey made at a farmers' institute nearly seventy years ago, can serve to introduce the method of this book. The content of this history is organized chronologically on the assumption that an institution has a life span and that at any moment it can be described (and its vitality measured) in terms of the forces generated within the institution interacting with forces produced within other institutions to which it is related. From this point of view the history of the New York State College of Agriculture at Cornell University is the examination of the interaction of internal and external forces over the series of moments comprising its life span. To use this approach within the pages of a single volume, I have chosen to measure these moments by decades in the belief that this period is sufficiently long to permit recognition of the major elements affecting the development of the College and, at the same time, sufficiently short that the interplay of forces does not defy analysis. The last chapter, where the information is drawn largely from published sources and the life of the College is examined less intensively than for the years preceding, covers two decades.

Many persons merit recognition for their contribution to this book, not the least of whom are Isaac P. Roberts, Liberty Hyde Bailey, and other historic figures whose lives were of such interest and significance as to be worthy of record. To four persons thanks are due for background assistance of considerable importance. First among these is my father, who introduced me to New York agriculture by communicating his affection for the land and its products. To Professor Paul W. Gates I am indebted for many stimulating conversations on the history of agriculture and, along with Richard Bliss and Warren Leonard, for encouragement to try out ideas which seemed to me important. Of those directly responsible for the genesis of this history,

AUTHOR'S NOTES

former Director Lloyd R. Simons stands preeminent; it was he and former Dean William I. Myers who took the initial steps toward securing its preparation. The support of these men and of Dean Charles E. Palm, Dean F. H. Stutz, and Director W. K. Kennedy is much appreciated. Dozens of persons currently or formerly connected with the College have provided information or criticized parts of the manuscript; the aid of A. W. Gibson, L. A. Maynard, T. E. Milliman, W. I. Myers, L. R. Simons, H. C. Thompson, K. L. Turk, and S. W. Warren is especially noteworthy. Thanks are due my wife Cynthia and Professor Gates for reading the entire manuscript at several points during its preparation. Needless to say, many improvements are due to their efforts.

This study is largely based on manuscript records housed in Cornell University's Collection of Regional History and University Archives. To its staff I am indebted for hospitality and assistance freely given.

Acknowledgement is due the Macmillan Company for permission to quote from L. H. Bailey's *The State and the Farmer*.

This history of the New York State College of Agriculture is part of Cornell University's contribution to the observance of the centennial of the Morrill Act. It is not, however, an official history. In accord with Cornell tradition, I have been given a free hand in its preparation. Responsibility for the result is mine alone.

G. P. C.

June 1, 1963
Ithaca, New York

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EDUCATION AND AGRICULTURE

**A History of the New York State College of
Agriculture at Cornell University**

CHAPTER I

Backgrounds, 1850-1867

IN the nearly one hundred years which have elapsed since that June day of 1866 when Ezra Cornell turned a spadeful of earth to mark the location of a classroom building for the university carrying his name, the institution he initiated has developed to bear witness to his foresight. With a fortune garnered from Western Union dividends and an impressive strength of will, this Tompkins County farmer had decided to make his adopted village of Ithaca, then as now distinguished for beauty of location, a center for business and cultural enterprise. Once he set his sights, Cornell was not a man to accept lesser goals, yet even his sizable fortune was insufficient to make Ithaca a commercial entrepôt during a period of economic instability. His support for higher education, however, more in phase with the movement of events, remains his enduring monument. Although success was consequent to drawing on other men for ideas and energy, a large element was of his making. It was his farm, located high on a plateau overlooking Ithaca and Cayuga Lake, that provided the site for the new university. It was his fortune which supported the initial construction. It was the fortunes of his friends, particularly that of Henry W. Sage, which made possible additional construction. It was astute management by Cornell and Sage of New York's share of the Morrill land grant that secured for Cornell University an endowment which proved highly significant in the years before the University built up a substantial body of alumni.

Until shortly before the University was established, Cornell's interest in higher education had centered on the possibility that a college could provide a means for improving New York State agriculture. For at least a quarter of a century he had pursued the vision of agricultural improvement. Yet when the time came to establish his educational institution, circumstances required him to

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combine his ideas with those of other men; and, in the process, agricultural education was reduced from the status of primary objective to a subordinate role in the University curriculum. To the extent that the University was founded by Ezra Cornell it was rooted in New York agriculture, and it is with these roots that this history will begin.

There was much in New York State in the years before the Civil War to excite a person interested in agricultural reform. Farm practices generally left much to be desired, and since farmers were numerically by far the largest occupational group—over 310,000 of 888,680 males enumerated in the census of 1850—there was a great challenge to that small band of reformers who would lead farmers away from the errors of their current practices.* Tillage was primitive by modern standards. Although great improvements had been made in the plow since 1820, the capabilities of the implement were rarely matched by the man who held the handles.¹ Seldom did plowing exceed a depth of six inches, thereby assuring a shallow bed for seeding. The principal implement for fitting the land was the hinged spike-tooth harrow. This implement, it was widely claimed, could be readily cleaned of trash, which suggests the frequency of trash, especially weeds, in the fields at the time. Noteworthy was that hardy perennial, the Canada thistle. Abundant in all parts of the state, it resisted eradication by all means except digging out the roots. Should a farmer go to this length to end the thistle's competition with his crops, a new infestation was assured from seeds blowing in from the four-foot belt of weeds growing within the angles formed by the worm fences around his fields. The hegemony of the pigeonweed (*Buglossoides arvensis*) over domesticated plants in many New York fields was another indicator of the level of cultivation. Reproducing annually and therefore subject to control by cultivation in the fall and spring, this plant was considered the weed most destructive to agriculture in the middle counties of the state.

The fertility of the soil was neglected. Manure which should have been returned to the soil was wasted. John Delafield, that astute

*There were in addition a large number of farm laborers. Probably a majority of the nearly 175,000 males listed by the census as laborers were farm workers.

BACKGROUNDS, 1850-1867

observer of agricultural practices, thought that in Seneca County only about one farmer in ten used it wisely. Modest amounts of wood ashes were occasionally used as a fertilizer. Except for a very few farmers who were experimentally inclined, the use of guano was practically unknown. Gypsum, which provided a source of calcium, was the most widely applied fertilizer. Delafield noted that in Seneca County it was a "universal" practice to apply gypsum to land seeded to clover at the rate of one bushel per acre. It is fortunate that larger quantities were not applied, for New York soils were not notably lacking in calcium; whatever effort was expended in applying gypsum was largely wasted. The rotation of crops, which could have assisted materially in the maintenance of soil fertility, was either neglected or carried on haphazardly outside of western New York. The application of lime, which would have been of substantial benefit, was rarely undertaken.

Soils other than those naturally well drained were "cold," prone to heaving in the winter, and difficult to till adequately because of excessive moisture. Only the slightest beginning had been made on tile drainage.

The tendency to cut costs of production by stinting on fertilizers also applied to the seed that was used for planting. Good seed, then as now, cost more than seed of inferior quality. The latter was commonly used, apparently in the belief that it would yield full measure at the harvest. Some farmers went so far as to sow tailings from their fanning mills. It may well be that the oft-repeated notion that wheat degenerated into chaff was given added currency by the use of inferior wheat seed that failed to germinate, thus leaving the field to the chaff seed already in the ground.

Horses, numbering nearly half a million in 1850, furnished the principal source of power, especially in the flatter, more mechanized areas of western New York. Even though their use was encouraged by some of the better farmers, only 963 asses and mules were discovered by the census enumerators. Oxen were used more extensively in the hilly areas of the state. In 1850 working oxen numbered 179,000, and much space in agricultural publications was given to methods of breaking oxen to the yoke.

Dairying was an important New York State industry, made so

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less by the quality of the cattle than by their numbers, nearly one million in 1850. Although estimates of milk production per animal vary, all were astonishingly low by present standards. Delafield thought that the milk produced in the state per cow per year yielded on the average about 90 pounds of butter and 110 pounds of cheese, but census figures for 1850 suggest that his estimate of cheese production was excessive. There was considerable variation within the state. Northern New York, which specialized in dairy farming, had higher-producing cows than western New York, which was primarily a grain-producing area. Butter and cheese making were home industries, and luck was frequently the principal ingredient in a successful product. Outside butter produced in Orange County, where an enclave of butter-making skills existed, the New York product had a poor reputation. Ultimately, much of it was sold as grease, at about half the price of the genuine article. Cheese making fared a little better. Cattle, other than dairy cows, numbered about 760,000 in 1850. In Wayne County about one-third of the cattle consumed for beef were slaughtered in the county, the rest driven to city markets. The quality of the meat may be inferred from the common practice of feeding cattle through the winter on straw and other coarse provender that had no cash value. Although some Shorthorn and Devon cattle had been imported into the state and crossed with native cattle, the improvement by breeding was limited to a few localities. The general pattern was one of neglecting to utilize what good blood was available. Nevertheless, cattle were more profitable than sheep, and in 1850 many New York farmers were switching to cattle.

Although there were about thirty times as many sheep on New York farms in 1850 as there would be a century later, even then the number had fallen to one-third of those on New York farms at the beginning of the previous decade. With low wool prices prevailing after 1842, sheep followed the frontier westward to a region of lower production costs associated with grazing on cheap land or on the public domain. During the same decade of 1840 to 1850, the number of hogs in the state fell about 50 per cent. As midwestern farmers found these animals good consumers of their corn, New York farmers discovered it was more profitable to feed their corn to cattle. The

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care of swine was generally neglected by New York farmers. Better management of these animals might well have led to a more profitable adjustment to midwestern pressure. At that time, however, neither the knowledge nor the inclination was present. In this transition from sheep and swine to cattle, New York farmers were making, in the area of animal husbandry, as dramatic an adjustment as they would again accomplish in a hundred years.

The production of poultry on New York farms in 1850 was thoroughly unorganized. Although the breeding, feeding, and housing of the larger animals was primitive by modern standards, at least most farmers were aware of these matters and some were making an effort to improve them. This was not true with poultry. As poultry yards were practically unknown, chickens of nondescript origin fended for themselves in fields and barnyards. The annual egg production is, of course, unknown, but it was estimated at the time at eight eggs per hen. Poultry products were a luxury for city people. When the gradual extension of the Erie Railroad into upstate New York in the 1840's made possible quick transportation of poultry and eggs, prices of these commodities immediately increased 25 per cent, and even then buyers were unable to secure an adequate supply.

Substantially more grain—wheat, corn, oats, and rye—was produced by New Yorkers in 1850 than their descendants would produce a century later. Wheat production was at its height, and yields in western New York were respectable (the Seneca County average was twenty bushels an acre) in spite of attacks from the midge and the Hessian fly. That farmers successfully met such formidable pests was due to the development of tillage and planting practices which circumvented the worst effects of the fly and the midge. Unquestionably the yield of wheat had declined over the years in western New York, but the decline had been less precipitous than in the eastern part of the state. Famed horticulturist Andrew Jackson Downing observed that areas of Dutchess County that once produced thirty bushels of wheat to the acre produced six in 1851. This decline Downing attributed to farm practices which resulted in "skinning" the land of its fertility. Also relevant were the effects of the black stem rust, which spent part of its life cycle on the barberry bushes native to eastern New York.

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The production of corn in New York was increasing in 1850 in spite of cutworm depredations, although the rate of increase was small when compared to that of the Midwest. Corn was grown in all parts of the state and was used for both grain and fodder. Cornfields received what manure was applied. Some selection of seed was occurring in order to obtain varieties which would ripen under New York conditions.

Hay was the state's principal crop. In 1850 New York was the largest hay-producing state, accounting for more than a quarter of the nation's production. One might anticipate that this degree of specialization would have led to improved practices, but such did not generally occur. Hay, usually consumed on the farm, was subordinated to those crops normally sold for cash. The preparation and maintenance of ground for hay and pasture was neglected in favor of planting grain. Clover, which was frequently rotated with wheat in western New York, was not cut until the blossom was ripe and the most nutritive elements in the plant had departed. Timothy was harvested after the wheat, when little remained but woody fiber. In other parts of the state even this poor-quality hay was exceptional, for all too frequently weeds and self-seeded grasses dominated meadow and pasture.

Potato production declined 50 per cent in the decade 1840-1850, following the appearance of a blight then called "potato rot"; but since the blight struck other areas also, New York still accounted for about 25 per cent of the national production. From the point of view of farm management, the blight was not an unmitigated disaster, for the decrease in quantity quickly led to an increase in price. Attention was thereupon called to the practices of certain farmers who by careful attention to cultivation and seed selection were able to increase their income from potatoes in spite of the blight. Before its advent New York potatoes were consumed at the table and by livestock; but the varieties fitted for table use, being less blight resistant, had largely given way to the coarser varieties by mid-century.

Apples, like potatoes, were valued as feed for livestock and their relative merit was a subject of considerable discussion among farmers. Also discussed, but to a lesser degree, were the relative merits of sweet and sour apples. One observant farmer noted that

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his pigs, if allowed to make a choice, preferred their apples sour. Certainly the production of apples had increased considerably in the five years before 1850, especially in the areas best adapted to fruit growing—the Hudson Valley and the Lake Ontario plain. It was estimated, on the basis of Erie Railroad clearances, that Wayne County shipped 400,000 to 500,000 bushels in 1851. Thanks primarily to the writings of New York horticulturists Andrew Jackson Downing and John J. Thomas, the volume of sound information about fruit varieties had increased substantially in the years immediately before 1850. At the time, however, this information had little influence on the practice of itinerant grafters who made exaggerated claims for the quality of fruit which would follow use of their scions and who, by their fraudulent misrepresentations, contributed to the current meaning of their occupation in the American speech.

Diseases and destructive insects posed a major handicap to increasing the production of orchards, animals, and fields. How little was known about the nature of diseases is indicated by the emphasis put on purging and letting blood from the bodies of humans and animals as a means of relieving their ills. People consumed patent medicines in vast quantities, lacking more certain remedies. "Cures" for plant diseases like the "potato rot" were numerous, and if many of these had some relevance to the disease, none was in itself an adequate remedy. Insects at least were large enough to permit man to observe their life cycles. This knowledge made possible such minimal controls as late planting of wheat to avoid the worst damage of the Hessian fly, plowing trenches around fields to trap crawling insects, digging grubs from trees, and shaking insects from branches.

Forests were not regarded as a crop to be replanted after a harvest of timber. Trees that survived the initial clearing and the increased market for timber created after the construction of the Erie Canal were being cut around 1850 to provide lumber for plank roads. It was confidently assumed that these roads, financed by joint-stock companies, would provide the means of rapid overland transportation. In 1849 Jefferson County alone had 140 miles complete or under construction. Plank roads, however, were soon dismissed as a craze, for the planks quickly rotted, thereby posing considerable danger to horse and traveler alike. With the exception of a few turnpikes con-

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structed prior to 1850 on stone foundations, roads returned to the condition of previous years—muddy in spring, dusty in summer, rutted or snow filled in winter.

It was a rare farmer who kept methodical farm accounts. Even some of those respectably literate individuals who answered the simple inquiries of the commissioner of patents—and this alone separated them from the mass of farmers—admitted an inability to make adequate reply because they had no records.* Many farmers, indeed, did not know with any degree of precision the size of their fields or the yield of various parts of their farms. Under these circumstances farm management was a matter of following tradition or intuition.

Wages for laborers on New York farms in 1850 were in the range of sixty to seventy-five cents a day, including board and lodging, although in the north country a skilled cradler could earn as much as \$1.50. Wages for men employed by the month ranged from \$8 to \$14, depending on the part of the state and their degrees of skill. Low though they were by present standards, these wages were high relative to the selling price of farm products at the time. So scarce was labor at prices farmers could afford to pay that many farm operators turned toward mechanical aids to accomplish the work. This was especially true in western New York, where agriculture was more commercialized and the land sufficiently level to permit the operation of the somewhat cumbersome machines. In 1843 the first reaper introduced into Seneca County did the work of seven cradlers, and by 1850 the Hussey reaper was being manufactured at Auburn. Mowing machines were widely used in western New York, and grain drills were attracting some attention. Threshing machines, which had generally replaced more primitive methods, were operated by the horse power, a device for utilizing the energy of horses attached to a sweep or moving in a treadmill. Crops of recognized value not then subject to mechanization, such as turnips and carrots, were being discontinued.

In terms of the effort required, the lot of the farmer's wife was at least equal to that of her husband. The lower wage for female help

*Until 1862, when the Department of Agriculture was established in Washington, the federal official responsible for agricultural improvement was the commissioner of patents.

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—\$1 a week—provided little incentive for mechanization. The replacement of the fireplace by the wood-burning stove, however, considerably simplified woman's work in winter. Advertised in 1850 as "automatic heat," this simple device was ridiculed by a number of traditionalists, who probably feared it would weaken the fiber of the younger generation. There were, however, few other major mechanical improvements in homes. Women were expected to raise large families, manage a large house, make the butter and cheese, and sometimes milk the cows. Of course, in the butter-making process they were often aided by a sheep or a dog which walked in a treadmill to provide power to operate the churn.

Since farm and homemaking practices have altered so markedly in the century following 1850, it is easy for us to assume—inculcated as we are with the concept that change is inevitable—that the major trends in 1850 were clearly in the direction of these changes. Such an assumption would be far from correct, for at that time pervasive socioeconomic forces operated toward the stabilization of existing conditions. Predominant among these was the educational system.

Agricultural education began when children were young and took the form of acquainting them with farm tasks to the measure of their ability. Little theory was involved. Children learned by doing, either at home or while working for neighbors. Charles Y. Lacy, the first graduate in agriculture at Cornell University, remembered driving two horses on a harrow for a half day when seven years old and doing the same thing all day for weeks on end when eight.² By similar means girls were introduced to sewing, cooking, and other household tasks. This method of education, conservative in its essence, involved the transmission of farm and household skills from generation to generation in the same way that earlier people had transmitted skills in hunting game.

The content of formal education and the conditions under which it was conducted added little to what understanding of agriculture was acquired at home. The typical learning situation involved a one-room school serviced by wood stove, common drinking bucket, and unsanitary privy and presided over during winter months by a youth who regarded teaching as a steppingstone to a more attractive occupation. Indeed, in 1850 fewer than three thousand New York males

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would admit to being teachers (and teaching school was then an occupation for males). There were fewer teachers than there were carters, coachmakers, coopers, joiners, peddlers, sawyers, and wheelwrights.³ The teacher was essentially a taskmaster, the learners' task being to commit to memory books in reading and arithmetic, to recite long passages from the former with proper gestures, and to write with a round firm hand. Neither the readings, which tended toward the patriotic and sentimental, nor the examples in arithmetic had much relevance to the farm lives most of the students would lead. Downing insisted that the local schools were actually subverting agricultural improvement by luring the more talented youngsters away from the roles of farmer and farmer's wife, a condition he claimed occurred when they were exposed to teachers and textbooks oriented toward the learned professions—law, medicine, and the ministry.⁴

Agricultural reform could hardly be expected from the colleges, for they served these three honored occupations with the same methods pursued in the local schools. Themselves poorly differentiated from the academies (later called high schools), they admitted students at the age of fifteen and then subjected them to a highly structured curriculum which emphasized learning by rote. To gain admission, proper social background or orientation toward the ministry were desired qualifications. The occasional suggestion that the admission policies and the educational program of American colleges should be democratized was dismissed as visionary by spokesmen for the existing institutions.⁵

Since the books produced by the American educational system contained little that was relevant to farming, it is not surprising that farmers were highly skeptical of what little agricultural information was to be found in them. "Book farming" was used as a brickbat for assailing foolish ideas. William H. Brewer, a Tompkins County farm boy who was for many years professor of agricultural chemistry at Yale, recalled, "I continually heard that term used with profound contempt all through my youth and manhood by many men not otherwise ignorant."⁶

There was no dearth of men anxious to reform education as it affected agriculture, but their effectiveness was reduced through

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failure to agree on the goals to be adopted or the means to be pursued. In a noteworthy instance where an element of agreement was attained, the effort failed through the inability of those who administered the plan to approach the dedication of those who set it in motion. This was the experience of the New York State Agricultural Society in the 1840's. Organized in 1832 through the efforts of Jesse Buel of Albany and reorganized in 1841 after a series of lean years, the organization at that time secured a subsidy from the state of \$8,000 a year, part of which was allocated to county units on condition that the allotment be matched by local contributions. The principal educational instrument of the New York State Agricultural Society was the agricultural fair. These annual events, held at both county and state levels, provided a meeting place for the inspection and judgment of a wide range of farm products and farm implements. The educational value of these fairs was largely a function of the standards used in judging the displays. If production standards were used in awarding premiums, the quality of an item was judged in relation to production conditions most farmers would be able to meet; if fanciers' standards were used, judgment was rendered without relating the item to the means of production possessed by most farmers. In terms of advancing the education of large numbers of farmers, production standards were as valuable as fanciers' standards were destructive.

The outlook was hopeful with the clear-cut adoption of production standards in 1841. However, the substantial sums of money and the element of prestige attached to receipt of premiums provided considerable inducement to win prizes by giving fancy treatment to a small number of animals or a small area of land. To make certain that items entered for competition did not result from such practices, a notarized statement of the conditions under which each entry was produced had to be submitted to the officers of the society. Unfortunately, it soon became apparent that this requirement was not being met.⁷ Failure to insist on the submission of records, from which the commercial applicability of the methods used to produce the premium entries could be determined, vastly reduced the value of the agricultural fair as a method of improving agriculture.

The development of model farms was also advocated by a number

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of reformers, the assumption being that farmers who saw these farms would then go home and recreate the operation they had witnessed. That this concept still had vigorous support as late as the 1870's indicates how thoroughly unrealistic a number of agricultural reformers were. Advocacy of model farms was based on a simple view of agriculture not unusual among reformers who had no personal acquaintance with farming. These men remained secure in their faith by remaining unaware that a farm was an unreproducible complex of soil-plant-animal relationships. Although vocal and persistent, the advocates of model farms were always a minority among agricultural reformers in New York.

Greater support was given the view that formal agricultural education for young people would be an effective approach to improving agriculture. At issue among those who held this view was the kind of school to be established. Some wanted a school of practical farming where the student would learn how to plow and mow and "make ends meet"; others wanted a school which would teach the sciences underlying agriculture with perhaps some ancient language added; still others wanted to achieve both ends with a school teaching the theory and practice of agriculture. The latter position was taken by Simeon DeWitt as early as 1819. The method by which schools would be financed was also an open question. Those advocating a self-supporting institution were countered by those who insisted that state endowment was vital to success.⁸

A number of agricultural schools were actually opened in the state in the 1840's and early 1850's. All were privately financed, in several cases by stock subscriptions, all featured manual labor by students as the basis of the educational program, all had a small enrollment, and most had a short life. Here are three examples. In October, 1846, the Western New York Agricultural School advertised for students, the cost for forty-four weeks of instruction being \$100, which included "board, washing, tuition, lights and firewood." Three months later the school closed because of insufficient funds.⁹ The Dutchess County Agricultural Institute began with three students in 1846. By the spring of 1849, when it had moved to Mt. Airy at Germantown, Pennsylvania, it had fourteen students.¹⁰ The Oakwood Agricultural Institute had a life span of one year. It was housed

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in a farmhouse near Buffalo, and the student body consisted of a dozen boys, aged fourteen to seventeen.¹¹

These failures bear examination. In terms of educational objectives, these schools sat squarely on the horns of a dilemma. Manual labor expended in acquiring farming skills had little value for farm boys who could learn much the same thing at home while contributing to the family income. There was little demand from farmers for instruction in the theories underlying the practice of agriculture. Farmers were not generally inclined to see the relevance of agricultural chemistry to growing corn and potatoes and, given the development of the subject at the time, they had much reason for their skepticism. On the other hand, the schools could not attract nonfarm youngsters, for farming was then widely regarded as an unprofitable occupation. In urging the establishment of an agricultural school, DeWitt devoted a substantial part of his forty-two-page pamphlet to an attempt to lay that particular hobgoblin to rest.¹²

Efforts to introduce agriculture into elementary schools, and in the process correct their orientation toward the so-called learned professions, met with little more success. Several books were published, including *The Farmers' School Book* by J. Orville Taylor. Published in Albany in 1837 and republished at Ithaca two years later, this 238-page compendium of agricultural practice was designed to be used in place of *The English Reader*, *The Columbian Orator*, and similar books. By giving "practical knowledge to the labors of manhood" the author hoped to "make farming *delightful, honourable, and profitable*." If we judge by the number of copies extant in 1960 relative to those of titles it was designed to replace, there is little evidence that the book had more than a modest sale.

Another group among agricultural reformers advocated an experimental farm. There was much logic in this position. If schools were to serve as a vehicle for agricultural improvement, they needed a body of sound information concerning agriculture from which to draw. In 1850 no such body of information existed. This is not to say that there were no good farmers at the time; indeed, a number of men were applying techniques later demonstrated to be scientifically sound. However, the reasons for success were often misunderstood. All too frequently progressively minded farmers learned to

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their sorrow that practices which brought prosperity to their neighbors brought disaster to themselves. Until the principles underlying farm practices were established by scientific experimentation, successful farm management would remain an art.

There were a number of attempts to turn science to the use of agriculture in the 1840's. Agricultural chemistry had been developed as an experimental science by Baron Justus Von Liebig at Giessen, Germany, and his conclusions were eagerly received in America following the English publication of his *Familiar Letters on Chemistry* in 1843. Liebig dismissed the view that the organic portion of manures had value for plants; only inorganic substances could be assimilated, he insisted. His explanation of plant nutrition made possible a simple means for increasing crop production. All that was necessary was to analyze the ashes of a plant to determine its needs, then analyze the soil to determine what it lacked, add the necessary mineral supplement, and let nature do the rest. Unfortunately, his explanation of plant nutrition was erroneous but Liebig, a somewhat overly proud genius who was quick to draw conclusions but reluctant to admit mistakes, left it to farmers to proclaim the error of the mineral theory when they found that yields did not meet expectations following the application of his principles.¹³ Some experimentally inclined farmers in New York and New England had come to other conclusions than Liebig's but, like him, had derived their conclusions from very limited observations. In 1848 John Stanton Gould, later to be the mainstay of agricultural education at Cornell, declared:

Hitherto, experiments and observations have been so loosely made, that scarcely a single mooted question in agriculture has been definitely settled. So great has been the discrepancy of the results that have been published, that it would seem that each experimenter believed that there was but one soil, one climate, and one set of circumstances, to influence results.¹⁴

The status of agricultural chemistry among farmers had declined by 1850 after the fanfare of earlier years failed to produce viable results.

Drawing erroneous conclusions about basic botanical processes was practically inevitable at the time, for agricultural science had not yet passed through the natural history phase of its development.

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Little was known about the components entering into agricultural production, to say nothing of their range of variability. Until the basic elements affecting plant growth were recognized there was little possibility of generalizing beyond the conditions under which experiments were conducted.

Given the element of uncertainty of outcome following the adoption of new practices, it is understandable that most farmers stayed close to traditional methods. For some, conservatism was so innate that it did not seem to require logical justification. John Johnston, the Geneva farmer who introduced tile drainage into this country, recalled that, when he began laying tile in 1835, "some would ask if I was going to *put crockery all over my farm.*" Other men, whose conservatism arose from seeing farmers go bankrupt after investing in improvements which cost more than they returned, warned Johnston that tiling would surely cost him his farm.¹⁵

An abundance of inexpensive land also mitigated against improvement in agriculture. It was considered cheaper to occupy new land than to improve land that was decreasing in production. The ready availability of land led New York farmers in the 1840's to spread their energy over more land and more animals than could be cared for to best advantage.¹⁶ Widespread efforts toward agricultural improvement awaited more intensive agriculture, but in 1850 the end of low-cost land in the West that could be taken up by emigrating New Yorkers was not yet in sight.

Finally, the subsistence element bolstered the agricultural *status quo* in 1850. Once the land and basic implements were obtained, farmers needed little cash. Since social services were few, taxes were low, and one of these, the tax on highways, was paid in labor. As long as the farm produced most of the family needs, there was less incentive to make improvements which, in a purely market economy, would be necessary to continue in agriculture.

Against the social and economic pressures tending to stabilize the agricultural practices of 1850 must be weighed other pressures tending toward change. Basic among these was the snowballing effect which occurred as improved machinery replaced less efficient equipment. Farmers made this change in order to reduce the cost of production, but they tended to increase the number of units produced

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in order to finance the cost of the new machines. In addition to this planned increase there was an additional output due to the improved efficiency of the new machines. Spring-tooth harrows, for example, made a better seedbed than the spike-tooth harrows they replaced; seed planted with a drill had a higher and more uniform germination than that sown by hand. Agricultural production increased more rapidly than the demand for agricultural products. To circumvent the resulting low prices the individual farmer often increased production in order to increase income, and this, in turn, called for further mechanization.*

The growth of cities, combined with the development of rail transportation, created a demand for certain agricultural products not currently emphasized on New York farms. Poultry has already been mentioned. Fluid milk is a more significant example. By 1850 urbanites were becoming aware that New York farms provided a source of fluid milk that was more tasty and wholesome than that which came from cows housed near cities and fed exclusively on distillery slops. Fluid milk was first shipped from Orange County in 1842, and thereafter the production of milk for fluid consumption slowly displaced production directed toward butter and cheese manufacture.¹⁷ The rapid decline of cheese and butter manufacture in New York, however, was not to occur until the early decades of this century.

As railroads extended into upstate New York, they not only changed agriculture by orienting it toward a market economy but, by annihilating distance within the memory of living men, prepared many people hitherto unaware of the dramatic possibilities in the technical applications of science, to believe that such applications opened the way to a better, more exciting life. Even more was this true of the telegraph, popularly called "the lightning," for while the steam train involved the application of principles widely understood, few had any understanding of the electromagnet. Dramatized by itinerant demonstrators who sometimes suggested that magnetism might open doors to the occult, telegraphy made a profound impact

*"If prices fall," noted the *American Agriculturist* in a description of McCormick's reaper, "we must endeavor to grow our products at less cost" (Aug., 1844, p. 238).

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on a generation which measured distance in terms of how far a horse could travel in a day.¹⁸ Change was in the air, and changes, once widely adopted, suggested new directions for education.

In 1842 a small book was published in Boston bearing the title *Thoughts on the Present Collegiate System in the United States*. Its author was Francis Wayland, President of Brown University. After reviewing the educational methods then in vogue, he dismissed manual labor schools as irrelevant to the needs of society. A college meeting these needs, he declared, must give attention to the sciences. By calling for a wider choice of studies to furnish the basis for the new education in science while maintaining the substance of the old classical curriculum, Wayland anticipated the elective system later popularized by Charles W. Eliot and Andrew D. White. Wayland's was not a voice crying in the wilderness. Within the decade the basis was laid for the Lawrence Scientific School at Harvard and the Sheffield Scientific School at Yale. In New York State, Regent Samuel Luckey warned that any agricultural school established in the future should avoid "every appearance of affinity with the old hackneyed theories of manual labor schools."¹⁹

The impact of European agricultural science promoted change. The most virulent period of American nationalism, when things European were dismissed as unworthy of American consideration, had passed by 1850, and the way was open for the study of European scientific developments on their own merits. The consequences which followed the uncritical acceptance of Liebig's explanation of plant nutrition did not lead to a general reaction against European science. The work of J. B. Lawes and J. H. Gilbert at Rothamsted in England was highly respected. The investigations in plant nutrition conducted at the experiment station on Lawes' farm were closely followed, and considerable space was devoted to their description in the *Transactions of the New York State Agricultural Society*.

Newly established agricultural periodicals promoted change by linking together islands of agricultural improvement. Subscribers could learn about new agricultural practices and the conditions under which they were adopted without waiting for the annual publication of the *Transactions*. They also could read the recommendations of farmers with a reputation for successful management.

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Of the three agricultural periodicals established in New York in the 1840's, the *American Agriculturist*, founded in 1842, and the *Rural New Yorker*, established in 1849, were still important publications over a century later. *The Horticulturist*, after an honorable life beginning with the editorship of Downing in 1846, ceased publication in 1875. Two periodicals started in the 1830's continued with increasing vigor through the following decade. These were the *Cultivator*, established in Albany in 1834 as the voice of the New York State Agricultural Society, and the *New Genesee Farmer*, reorganized in 1839 after publication for nine years under the title *Genesee Farmer and Gardner's Journal*. Those who wrote for these publications, either on a regular basis or by occasionally contributing their farm experiences, carried the main burden of agricultural education in New York until the College of Agriculture at Cornell and the New York State Agricultural Experiment Station at Geneva were firmly established.

In any analysis of the forces leading to agricultural change in New York, the impact of a small number of observant and articulate individuals who not only promoted changes but played a notable part in determining their direction must be considered. Some of these men contributed to the sciences related to agriculture — Samuel L. Mitchill, Ebenezer Emmons, and Asa Fitch. Some were practical farmers who used a trenchant pen in the agricultural press; in this group John Johnston stands preeminent. The contribution of others, especially Amos Brown and Ezra Cornell, lay in providing financial support or in persuading others to provide financial support for agricultural education. John Delafield effectively combined the roles of farmer and publicist. Andrew Jackson Downing and John P. Norton were both scientists and publicists.

Numerous contributions had been made to sciences related to agriculture — chemistry, entomology, geology, pomology — in the years immediately preceding 1850. Some progressive farmers, duly impressed with the increase in scientific knowledge and improvements in technology, believed they had passed from a dark age into one of agricultural enlightenment. In the light of our knowledge of science and technology, it is easy, in mid-twentieth century, to dismiss the enthusiasms of over a hundred years ago. To appreciate

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the basis for the feeling of progress at that time, the accomplishments of the years immediately preceding 1850 must be considered in relation to what had gone before.

The first organized efforts in New York State toward the improvement of agriculture were those of the Society for the Promotion of Agriculture, Arts, and Manufactures, established in New York City in 1791. In spite of its wide-ranging title this was an agricultural society organized not for literary display or studies of the unusual but

to supply the wants and relieve the necessities of mankind, and thereby to *render human life more comfortable*; to multiply the productions of the land, to shorten or facilitate the toils of the labourer, and to excite a Spirit of honest industry, whereby *riches may become more abundant*, and by inculcating the importance of ordinary and common things, and of practical everyday truths.²⁰

Probably few agricultural educators of today would take exception to these objectives.

Science had not yet acquired the aura it later enjoyed; indeed, the word hardly appears in the *Transactions* of this society. But certainly a scientific approach to knowledge was reflected in systematic records of observations and descriptions of experiments. The society moved toward the goal of applying science to agriculture in several directions simultaneously. A rudimentary survey by means of circular letters was initiated to obtain information on such questions as: "To what depth ought land to be plowed? How is your land best made mellow for the reception of seeds? What kinds of grain or grass are found by experience to thrive best in any particular soil? What substances do you find in soils, unfriendly or hurtful to vegetable life?"²¹ The president of the society, Chancellor Robert Livingston, conducted a number of experiments to determine the best agricultural practices. In 1792 he described eighteen experiments with calcareous and gypseous earths and two years later reported the results of a three-year sequence of experiments with alfalfa. The level of scientific understanding did not permit sound theoretical explanations of observations; witness Chancellor Livingston's statement that "we find in a calcareous earth, most of the elements that go to the composition of vegetables, to wit, earth,

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air, fire, water." However, his advice on experimental methods was thoroughly sound:

I would recommend it to the young farmer not to be discouraged from pursuing the culture of this plant [alfalfa] by the observations of some of the older ones, who will tell him that Mr. A. and Mr. B. tried it, *but it would not do*. Experiments carelessly made, or not regularly pursued, the accidental circumstances of soils, or seasons, afford no conclusive arguments, as may be inferred from the register I have exhibited. Out of about fifteen acres which I sowed last year, but four succeeded; had I not tried the plan in various ways, I should probably have determined that it was not worth attention.²²

The society also pressed for an institutional approach to agricultural science. In 1792 a professorship for natural history, chemistry, and agriculture was established at Columbia College, the salary of the professor to be paid under a five-year grant from the New York State legislature.²³ Samuel Latham Mitchill, secretary of the society, received the appointment. Like many of his contemporaries who were interested in science, Mitchill was trained in medicine. A highly speculative individual, he readily generated theories which would explain phenomena he had observed. Through a wide correspondence with scientists in this and other countries, Mitchill was able to examine the validity of his theories by determining how well they explained observations made by others. His theory on the formation of hailstones, his observations on the cankerworm, and his report on the soil and agricultural resources of the state suggest the broad scope within which he applied the techniques of science to agriculture.²⁴

A noteworthy feature of the society was the composition of its membership. Among the seventy-two incorporators were such worthies as Robert and Edward Livingston, John Stevens, John Jay, Simeon DeWitt, Horatio Gates, and Ezra L'Hommedieu. The remaining membership, while somewhat less renowned, was composed of men who, by wealth or position, had the leisure to pursue their interest in agricultural science.²⁵ Few among them, however, had the means to conduct experiments in the manner of Robert Livingston. The limited resources of most farmers would not permit risky departures from traditional methods.

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Notwithstanding the grant of state aid, the position occupied by Professor Mitchill did not evolve into a sound foundation for the development of agricultural science. A garden in connection with Columbia College, which Mitchill insisted was necessary for experimentation and class room illustration, was not established.²⁶ Moreover, state support was not placed on a permanent basis. Over one hundred years were to pass before the legislature would take that step with relation to a privately controlled university.

Although the Society for the Promotion of Agriculture, Arts, and Manufactures failed to achieve its goal of improving agricultural methods, it staked a claim on our gratitude by keeping alive the spirit of inquiry during what was generally a dark day for agricultural science. According to Elkanah Watson, by any measure one of the wisest and best-informed friends of agricultural education in the early nineteenth century, the society failed because the knowledge it accumulated "did not reach the doors of farmers to any visible extent. Nor was their plan of organization calculated to infuse a lively spirit of emulation."²⁷ Only five hundred copies of the *Transactions* of this society were printed, and it is unlikely that many of these reached hands bearing callouses from farm practice.*

The next attempt to advance agricultural science on a broad basis was instituted in response to the leadership of newly elected Governor DeWitt Clinton. On January 27, 1818, he told the legislature that "it has not been sufficiently understood that agriculture is a science, as well as an art; that it demands the labor of the mind as well as of the hands," a statement he developed to the conclusion that "if not the exclusive duty, it is certainly the particular province of the state governments to superintend and advance the interests of agriculture." Governor Clinton called for the creation of a state board of agriculture which would advance and diffuse agricultural knowledge in cooperation with county agricultural societies.²⁸ Such a state board of agriculture could, by providing an institutionalized structure for

*A resolution of the legislature authorizing publication of these *Transactions* at the expense of the state stipulated that a copy was to go to "each Person who shall be entitled to receive the Laws and Journals of this State" (*Transactions of the Society Instituted in the State of New York for the Promotion of Agriculture, Arts, and Manufactures*, 1794, p. ii—hereafter referred to as *Trans. of the Society*).

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the continuing development of leadership, overcome a basic weakness of the old society.

The legislature appropriated \$10,000 a year to implement the Governor's plan, part to be used for an annual publication, part to be allocated to county agricultural societies for awarding premiums to outstanding farm produce under the same conditions that were later in effect for the New York State Agricultural Society. The knowledge gained from the statements accompanying the award-winning products was to be extended to others through the annual publication of the State Board of Agriculture. The membership of the board was composed of delegates elected by county societies, the officers of which were required to be "practical farmers."²⁹

The State Board of Agriculture began with several pronounced assets: it enjoyed the support of Governor Clinton, and its president, Stephen Van Rensselaer, was a man of vast enthusiasm and ability. Several members of the board were able agricultural writers. This small group of educators planned well but, confronted with conditions far beyond their power to change, were prevented from reaching their goals. According to Elkanah Watson:

In every stage of the six years of experiment, the opposition to the law increased, and finally it was permitted to expire, by its own limitation [in 1825]. This opposition became outrageous, even with some farmers, members of the legislature; as though the fate of the state was implicated in the expenditure of ten thousand dollars a year, to promote its vital interests . . . This opposition had its most rancorous incitement by involving the system in the destructive and poisonous vortex of party politics, with which it is in no wise connected. Candour and truth, also, impel me to admit, that many of our counties had just cause for disgust and opposition, owing to the scandalous frauds and meanness committed by many base individuals in reference to the distribution of premiums; thus perverting the spirit, and magnanimous views, of the patriotic legislature of 1819; who were impelled, by the novelty of the subject, to take a leap in the dark—treading untrodden ground.³⁰

In 1825 a joint committee on agriculture of the Senate and Assembly conducted a post-mortem examination of this first attempt to organize agricultural improvement on a state-wide basis. After noting that no effort was made to enforce the provisions of the law

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requiring a statement of information prior to payment of premiums, the committee concluded that the law was unenforceable. Their report suggests that the law was a compromise between what the advocates of agricultural reform desired and what the people of the state would accept. The system desired by the former revolved around a department of agriculture established in the state government with a salaried officer in charge; the system that emerged from the legislation was centered in a board of delegates serving gratuitously for an indefinite term and without the means of enforcing the provisions of the law in the counties of the state. The committee recommended, on the basis of the six-year "experiment," the immediate establishment of a department of agriculture with the possibility in the future of creating "an experimental farm in connection with an agricultural seminary," a distant goal which the committee recognized "public sentiment is not yet sufficiently matured to embrace."⁸¹

Yet all was not in vain. For six years the Board of Agriculture served as a medium for the collection and publication of ideas. The three volumes which the board prepared are landmarks in the development of agricultural education in New York State and indicate, perhaps as well as anything, the vast gulf between the advocates of agricultural education and the constituency which they hoped to benefit. The first volume projects a survey of existing agricultural practices, including the physical and social environment in which these practices occurred, and contains four schedules for the collection of information in specified categories.⁸² Completion of these schedules depended on people in the various counties who had both time and energy as well as sufficient appreciation of the survey concept to make intelligible replies. Much of New York State was still frontier in 1820. It was difficult for pioneers to appreciate the relevance of survey schedules when busy struggling with tree roots too green to admit the plowshare.* The advancement of agricultural science by the survey technique awaited the passing of frontier conditions.

An outcome related to the activities of the Board of Agriculture, in

*It is reported that as late as 1842 only two-fifths of the land in Genesee County had been cleared (Neil A. McNall, *An Agricultural History of the Genesee Valley* [Philadelphia, 1952], p. 85).

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the long run of greater importance than its *Memoirs*, was the establishment by its president, Stephen Van Rensselaer, of the Rensselaer Institute at Troy, New York. Although intended from its beginning in 1824 as a school which would give instruction in science to those who would, in turn, teach the fundamentals of science in the lower schools of the state, this objective involved a reform of those schools too ambitious to be realized; by about 1850, the Institute had evolved into a school of engineering under the name of Rensselaer Polytechnic Institute. However, a thing once done well is done forever. For nearly twenty years prior to his death in 1842 the Institute provided a place where the pioneer scientist Amos Eaton investigated and instructed others in geology, chemistry, botany, and zoology. A number of those who studied there as students or colleagues of Professor Eaton later made significant contributions in New York and elsewhere to the sciences related to agriculture. Among them were entomologist Asa Fitch, geologist James Hall, and Ebenezer Emmons, an investigator with interests so broad as to preclude classification.³³

Legislation which was practically identical to that of 1819 was enacted in 1841, but with one important difference. Instead of constituting an administrative committee dependent on the uncertainty of authority delegated under a variety of local circumstances, the New York State Agricultural Society was made responsible for the administration of the law. By placing responsibility for agricultural improvement in the hands of this organization, the state took a small step forward, for administrative responsibility was fixed and provision was made for continuity.³⁴ On the other hand, this assignment of responsibility with the payment of a small subsidy was short of what the more farsseeing agricultural educators had desired twenty years before.

Prior to 1850 the program pursued by the New York State Agricultural Society to increase and diffuse agricultural knowledge was not noticeably more effective than the work of the Board of Agriculture. The agricultural fair as a medium for the improvement of agriculture in the state has already been discussed. A state-wide survey of agricultural practices was attempted and, as in the 1820's, the attempt ended in failure when only twelve counties complied with the corresponding secretary's request for reports on local

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agricultural conditions.³⁵ It was by providing a platform for the exercise of individual leadership in the improvement of agriculture that the New York State Agricultural Society earned our lasting gratitude.

In the 1850's and 1860's those who made the greatest contribution to the improvement of agriculture were usually not farmers earning their living from the land but men, such as Robert Livingston in an earlier day, whose farming was financed by wealth obtained in other connections. Such was true of John Delafield. Born in 1786, Delafield was a student at Columbia when Samuel L. Mitchill was a member of the faculty. He entered business with his father after graduating in 1802 and later became a banker in London and New York, but throughout these years he maintained an interest in the application of science to agriculture. In the middle 1830's he worked for the passage of an act to incorporate the New York State Agricultural School, in which he was named a commissioner to sell stock for the institution. Although the act was passed in May, 1836, insufficient stock was sold to establish the school. In 1842 Delafield moved to a farm near Geneva in Seneca County, where John Johnston was his neighbor. Soon he became an enthusiastic supporter of tile drainage and in 1848 imported the first tilemaking machine into the United States. In 1850 he made a classic survey of the agricultural resources and farm management practices of Seneca County, which he regarded as a base line with which later data could be compared.* The following year Delafield was elected to the presidency of the New York State Agricultural Society.

New York's need for an agricultural college was the subject of his presidential address, delivered in January, 1852. After noting that Great Britain had seventy agricultural schools and France seventy-five, Delafield observed that the experience of foreign countries indicated that such schools were not efficient without the support of government. The abortive attempts to establish such schools in the

*Liberty Hyde Bailey wrote in 1912 that Delafield's survey "may serve as a text at the present day." A biographic sketch of Delafield and the entire act of 1836 may be found in L. H. Bailey, ed., *Cyclopedia of American Agriculture*, IV (N.Y., 1912), 389-393. See also *Transactions of the New York State Agricultural Society*, 1850, pp. 350-616 (hereafter referred to as *Trans.*).

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United States he attributed to lack of adequate financing.³⁶ Delafield must have been well aware that the likelihood of securing state support for an agricultural college in New York State was slight. Six years previously the Assembly Committee on Agriculture had rejected a petition for state aid for an experimental farm and agricultural college on the basis that the state had never given funds unless the institution in question had first procured funds from other sources and, in any case, the state was already doing as much for agriculture "as can reasonably be asked of her."³⁷ Delafield had no choice but to rely on private sources. An act similar to that of 1836 passed the legislature in 1853, and soon thereafter Delafield's farm, Oaklands, was chosen as the site for the new institution. Unfortunately, Delafield was not to realize his hopes. His sudden death in October, 1853, resulted in the temporary abandonment of the enterprise.

Comparable in importance to Delafield's contributions to the improvement of New York agriculture was the work of John Pitkin Norton, appointed professor of agricultural chemistry at Yale in 1846 at the age of twenty-four. This young genius not only strengthened agricultural chemistry as a science but, through a direct style of speaking that avoided scientific jargon, presented to farm people in New York a realistic picture of what chemistry could contribute to the improvement of agriculture. Norton used the written word as skillfully as the spoken; in the late 1840's his writings received wide circulation in the agricultural press. In 1850 he received the \$100 premium from the New York State Agricultural Society for his prize essay, *Elements of Scientific Agriculture*, and one thousand copies of this 132-page essay were printed by the society.³⁸ That year Norton gave a public address during the Seneca County Fair. So great was his popularity that no building in Ovid could contain the audience which gathered to hear him; consequently, he spoke in the public square from a hastily erected platform. His speech that day was a model of sound judgment and has stood the test of time.

In contrast to Liebig, Norton did not assure his audience that the requirements of sound practice were met when the soil had been supplied with those elements which plants removed from it. His view of soil chemistry stressed other substances possessing what he called a "solvent power" — the capacity to make nutrients otherwise insolu-

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ble available to plants. Even those soils chemically sufficient, Norton warned his audience, require correct tillage and drainage to produce an abundant crop. Those farm practices are best, he declared, which are correct in theory and at the same time stand the test of experience.³⁹

Norton was convinced that experimentally oriented institutions should precede schools or colleges giving instruction in agriculture in order that there might be a substantial body of knowledge to teach. It was the research aspect of agricultural education which he was emphasizing at Yale when he died in 1852 at the age of thirty.⁴⁰

His death was an inestimable loss to American agriculture. "No other man," declared William H. Brewer, "has ever done, in so few years, so much for science and for education."⁴¹ Fortunately, the study of science in relation to agriculture at Yale did not end with Norton's death. His successors, notably Samuel W. Johnson, John A. Porter, and William H. Brewer, made Yale the outstanding center for the advancement of agricultural science in the United States throughout the 1860's and 1870's.⁴² It was not by accident that the first agricultural experiment station in the United States established with state aid was located in Connecticut.

Entomology in the 1850's had not progressed to the point of becoming an experimental science. Nevertheless, the importance of the subject was recognized by many progressive farmers. In 1854 Asa Fitch, M.D., was appointed entomologist of the New York State Agricultural Society, at a salary of \$1,000 a year, provided by the legislature. Fitch's reports, published in the *Transactions* of the society, were largely descriptive and of variable accuracy, for he was forced to depend on other observers for much information on the range and behavior of insects. Although a substantial part of his data was taken from sources already in print, he performed a useful service by bringing together observations from scattered and inaccessible publications, some printed in foreign languages. Like Professor Norton, Fitch was anxious to make his work of use to farmers. He classified insects according to the vegetation they infested, avoided technical language, and tried to be critical of existing recommendations for controlling insects considered harmful.

Not every student of New York agriculture shared this willingness to organize information for the use of farm people. A five-volume

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study entitled *Agriculture of New York*, published between 1846 and 1854, is a case in point. Written by Ebenezer Emmons, M.D., and financed by the state, these volumes were more notable for a wealth of undigested information, excellent bindings, and handsome lithographs than for any practical suggestions for the improvement of agriculture. Such publications tended to reinforce the views of farmers already suspicious of knowledge to be found in books.

Although Fitch and a number of his contemporaries approached the application of science to agriculture with a high degree of dedication and enthusiasm, the impact of their efforts on the public imagination was circumscribed by the limited circulation of their writings and their unwillingness or inability to popularize their contributions to agricultural science. After the death of John Delafield there was no effective bridge between agricultural scientists and members of the legislature, in whose hands lay the means for further support of agricultural education. It is one of the oddities of history that the man who took up Delafield's mantle as a promoter of agricultural education was little interested either in science or in agriculture, but his talents as an educator and a promoter were truly remarkable. This person was Rev. Amos Brown, who was at the time of Delafield's death in 1853 principal of Ovid Academy. "I have no doubt whatever in my own mind," wrote Professor William H. Brewer in 1894, "that, but for him, Cornell University would have been a very different affair from what it now is, if indeed, it would have been founded at all, if he had never come to Central New York.*"

*This statement, in a letter to W. T. Hewett dated Dec. 15, 1893, represents the considered judgment of a scholar well qualified to assess the work of Amos Brown. Brewer married Brown's niece and was a member of the faculty at Ovid Academy, the New York State Agricultural College, and (on paper) the People's College before becoming professor of agricultural chemistry at Yale. In a 127-page letter to Hewett dated March 11, 1894, Brewer developed, largely from personal experience, the history of agricultural education in New York from about 1830 to 1870. Therein he recounts Brown's activities and suggests how certain of Brown's personal qualities made possible both brilliant but temporary success and ultimate failure. Correspondence in the William H. Brewer Papers dating from the 1850's supports this analysis. (Brewer Papers, microfilm [hereafter MF]). Unless otherwise indicated, all manuscripts and microfilms are located in the Collection of Regional History and University Archives, Cornell University.

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In the year prior to Delafield's death Brown came from Maine to become principal of the then practically defunct Ovid Academy. Quickly he secured a new faculty and infused the institution with vigor; it soon became, according to Regent Samuel Luckey, the best-organized academy in the state. One of the tenets of Brown's educational philosophy was that a school should serve the needs of the surrounding community. To this end he employed Brewer to give a course on chemistry and its applications. These lectures, delivered in the Seneca County courthouse during the winter months, were well attended. Shortly after Delafield's death Brown conceived the idea of removing the New York State Agricultural College to Ovid and merging it with the Ovid Academy to form an institution strong in both the classics and the sciences. In 1855 he actively promoted this plan in Seneca County. By the end of January, 1857, Brown had raised \$46,000 by subscription to finance the development of the agricultural college after its removal to Ovid. The extent of this sum indicates some measure of the enthusiasm Brown generated, for it was raised locally without recourse to men of wealth. No contribution exceeded \$500. Brown had already approached the state legislature. His strategy there was to circumvent the tradition against public grants to educational institutions by getting a loan of \$40,000, which he assumed would eventually be canceled if the college were successful. He managed his case in the legislature carefully, and in March, 1856, the loan was granted along with transfer of the charter. Thereupon Brown was named to the Board of Trustees and appointed a member of important committees. However, it soon became apparent that a number of Brown's fellow trustees opposed him, and by the end of 1856 this group was in ascendancy. Instead of Brown, Samuel Cheever, a former president of the New York State Agricultural Society, was elected president. Soon thereafter Brown severed his connection with Ovid, to become president of the newly founded People's College at Havana (now Montour Falls) in Schuyler County.⁴³

The development of the New York State Agricultural College at Ovid after 1856 can be stated briefly. The administration of the College under President Cheever was marked by mismanagement. Perhaps because neither he nor the trustees were experienced in educational matters, they concentrated on the college farm and

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buildings. A sum greater than the entire state loan was spent to obtain a site for the College. Nevertheless, the trustees were optimistic, feeling, according to Brewer, that the institution was certain to be successful "merely because it was to be an *agricultural college*." By the beginning of 1859, however, the trustees had determined to rid themselves of their president and, after his resignation that January, they administered the institution for ten months through committees.⁴⁴ During this period the principal task was completion of the college building, a somewhat ambitious structure designed to accommodate 350 students. The College opened on December 5, 1860, with the new president, Major Marsena R. Patrick, heading an able faculty. A three-year course based on sound educational principles was announced along with the declaration that this was not to be a manual labor institution. Instead familiarity with the theory and practice of agriculture was to be achieved through closely relating classroom study to supervised practice in such farm techniques as pruning trees and breaking horses. The over-all charge for each student was to be \$200 a year.⁴⁵ In addition, short winter courses were planned for farmers in the area.⁴⁶ Yet, however promising the faculty and curriculum, the results of mismanagement of college affairs in the past in combination with the uncertainties of the times worked against success.

The College opened deeply in debt. In addition to the loan from the state, \$30,000 was owed to the Mutual Life Insurance Company of New York. The financial situation was so desperate that President Patrick and three other trustees gave \$250 each to support the operation of the College.⁴⁷ On the basis of correspondence the trustees had expected eighty students when the College opened, some of whom were to come from the Southern states. Due to political and economic uncertainties, however, only twenty-seven students actually enrolled, and the number never exceeded forty-five. With the outbreak of the Civil War, Major Patrick was needed in the army. In the spring of 1861, when it had operated less than six months, the College closed, never to reopen.⁴⁸

The People's College, to which Amos Brown went in 1857, like the institution which he left, received its charter from the legislature in 1853. Its original backer was Harrison Howard, a mechanic residing

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at Lockport, New York, who visualized it as a means for training workers in the so-called mechanic arts. In 1851 a plan for the People's College was prepared by Horace Greeley, who had become an enthusiastic supporter after Howard expanded the scope of the College to include agricultural education. The new institution was to be coeducational — a radical concept at the time — and manual labor was to be required of student and teacher alike. Subscriptions came in slowly. It was not until 1856, when Charles Cook offered a farm and a substantial sum of money, that the College was located in Havana. This was a momentous step as this small rural community was a most unlikely place for a college, especially one intended to educate mechanics. The support of Charles Cook, consequent to the location in Havana, did not strengthen the enterprise, because many early supporters abandoned the College after it fell into his hands. Moreover Cook, who appears in retrospect to have used his philanthropy to promote his political and business interests, was slow in making good on his promises of support.⁴⁹ At this point Amos Brown read in a newspaper that Representative Justin S. Morrill of Vermont had introduced a bill in Congress providing a donation of federal land to each state to aid in the establishment of colleges for instruction in agriculture and the mechanic arts. Apparently with no more information than was contained in the newspaper account, Brown set off for Washington to aid the passage of the measure.⁵⁰

As a lobbyist Amos Brown was in his element. Letters which he wrote to Professor Brewer from Washington reveal considerable insight into the operations of Congress. Brown worked indefatigably for the Morrill bill but surmised, quite correctly, that if the measure passed Congress it would be vetoed by President Buchanan. Nonetheless, Brown was optimistic about eventual success, for he felt the bill was in accord with "the demands of the time."⁵¹

Brown's assessment of "the demands of the time" was not based on the widely expressed opinions of farmers and mechanics, inasmuch as these groups were generally apathetic on the subject of agricultural and mechanical colleges. Rather it reflected the conviction of a small number of reformers that Americans were ready to accept a form of higher education open to the industrial classes and meeting their educational needs. There were, in practically every northern and western

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state, men whose interests and activities paralleled those of John Delafield and Amos Brown. Such men founded Michigan Agricultural College in 1855 and Iowa Agricultural College in 1858, in both instances with state support. Before 1860 others had secured authorization from the legislatures of Massachusetts, Maryland, and Pennsylvania for state-supported institutions providing instruction in agriculture.⁵² Unquestionably, the best known of these educational reformers was Professor Jonathan Baldwin Turner of Illinois. It was his speeches, articles, and correspondence, claim his supporters, which suggested to Representative Morrill the possibility of advancing education for the industrial classes through a distribution of federal land.

Turner's plan for an industrial university, published in the *Report of the Commissioner of Patents for the year 1851*, bears examination, for it is similar in its concepts to ideas advanced by Ezra Cornell and, indeed, may have influenced Cornell's thinking. An industrial university, Turner said, should teach "all those studies and sciences, of whatever sort, which tend to throw light upon any art or employment which any student may desire to master; or upon any duty he may be called to perform, or which may tend to secure his moral, civil, social, and industrial perfection, as a man." This university should be open to all classes of students, and the means should be available to those without sufficient money for tuition and board to earn these by labor on the premises. Rewards should be given to the best student laborers, that it may be established in the minds of all around "that *WORK ALONE IS HONORABLE*." The most unusual feature of his plan was the emphasis placed on research and particularly research involving replication. "The professors," he stated, "should conduct, each in his own department, a continued series of *annual experiments*." To illustrate, he suggested a number of experiments in agriculture such as were actually conducted at Cornell some thirty years later. Turner's plan provided the inspiration for a memorial to Congress from the Illinois legislature in 1853 asking assistance in the establishment of industrial universities in each state by an allocation of land from the national domain.*

*Turner's influence on the Morrill Act is examined by Carl Becker in *Cornell University: Founders and the Founding* (Ithaca, 1943), pp. 24-31. Apparently Becker drew his description of Turner's plan from a somewhat misleading secondary source.

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In 1862 the Morrill bill was again introduced in Congress, this time with a provision that land be granted each state at the ratio of 30,000 acres for each senator and representative it had in Congress. Amos Brown was again in Washington to promote its passage. The Morrill Act, signed by President Lincoln in 1862, represented the culmination of many influences. Passage of the act followed the departure of Southern representation from the national capital, for this group had opposed the principle of land distribution. A recent student of the subject, Professor Paul W. Gates, states, "It was the able lobbying of Joseph R. Williams, Freeman G. Gary, Amos Brown, Marshall P. Wilder, James Gowen, and the supporters of five other agricultural colleges, backed by forty-five petitions and memorials, thirteen of them from state legislatures, that won over hesitating members of Congress to the support of the Morrill bill."⁵³ Among this group Amos Brown played a leading, if not, as his supporters claimed, a vital role. Senator Benjamin F. Wade, who introduced the Morrill bill in the Senate, asserted that without the work of Brown the bill would not have passed. "It encountered great opposition in some quarters, on account of its supposed opposition to the 'Homestead Bill'," wrote Senator Wade, "and much also from the mere indifference of members who did not take interest enough in the measure to give it a thorough investigation, more still from several members of the public land states, who feared its passage would conflict with the rapid settlement of their states."⁵⁴

Similar statements were made by three other senators and nine representatives from New York, their purpose obviously being to assist Brown when the New York legislature decided which institutions should benefit from New York's share of the Morrill grant. Representative Morrill said as much in a letter recounting the value of Brown's services. Writing to Representative E. B. Morgan of New York, a trustee of the People's College, Morrill said, "It is due to him and to the institution of which he is the head, whenever a final disposition of the fund shall be made, that his merits shall not go unacknowledged by the State of New York."⁵⁵ Brown's efforts to secure the grant for the People's College were supplemented by those of Charles Cook, who was said to be well versed in the political arts and who was, in 1863, a member of the New York State Senate.

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In May of that year the entire Morrill grant was awarded to the People's College on condition that within three years the institution meet certain requirements including possession of a farm of at least 200 acres free of encumbrance, at least ten competent professors, and buildings capable of housing 250 students.⁵⁶

It soon became evident that these conditions were not being met. Charles Cook, never generous with his adopted institution, suffered a paralytic stroke and thereafter refused to give either additional funds or a clear title to the land which the College occupied.⁵⁷ It was at this point that leadership in the cause of agricultural education in New York was taken up by Cook's fellow senator, Ezra Cornell of Ithaca.

Until he was about twenty-two years old, Cornell lived on a farm. Even after coming to Ithaca in 1828, where he worked as a carpenter and millwright and soon rose to become manager of a plaster and flouring mill, his interest in agriculture continued. In 1840, when thirty-four years old, he helped organize the Tompkins County Agricultural Society and the following year served as marshal of the Tompkins County Fair.⁵⁸ In 1841 and 1842 he received first prize for the best acre of corn in Tompkins County, the yield in 1842 being a very respectable 107½ bushels to the acre.* Cornell was not then a wealthy man; his purchase of the purebred Shorthorn bull "Arab" about 1840 was a considered investment in farm management.⁵⁹ In 1841 he paid the minimum fee of one dollar for membership in the New York State Agricultural Society and in 1843 supplemented his income by becoming one of the seven agents in the United States for the newly established agricultural periodical, the *American Agriculturist*.⁶⁰

The previous year circumstances had led Cornell to become an itinerant plow salesman and later inventor of a plow which was used to bury wires for a trial of Samuel Morse's new telegraph. This led him into the telegraph business, where his mechanical ability and tenacity as a businessman carried him through a speculative maze from which he emerged with a sizable fortune for the time. During

*Cornell met fully the requirement for a statement of the conditions under which the prize crop was produced. He even indicated the moisture content when the corn was weighed and described his method of calculating the yield on the basis of a sample (*Trans.*, 1841, pp. 95-96; 1842, p. 396).

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those years of travel in strange places and association with difficult colleagues, Cornell's faith in scientific agriculture was strengthened, along with his conviction that the best citizen was the man who earned his living directly from the land.⁶¹

In 1846 Cornell advised his son Alonzo not to enter the telegraph business. "I should prefer," he wrote, "that you would choose a rural occupation and become an intelligent scientific [farmer]. The time is not distant when such farmers will be more respected as they will be more useful than Kings or Princes."⁶² In 1855 Cornell looked forward to the time when he could retire from the telegraph business and return to farming, a desire which he achieved in 1857.⁶³ That year Cornell purchased a farm overlooking Ithaca once owned by Simeon DeWitt and named it Forest Park.⁶⁴

Cornell then set about reviving the Tompkins County Agricultural Society, which had fallen to a low estate. Shortly before he assumed the presidency of the organization in 1858, its secretary reported that the activities of its members provided evidence "of a weak vitality and speedy dissolution."⁶⁵ This condition Cornell attributed, in the language of agricultural metaphor, to "the bitter waters of political strife [which] seemed to drown out the crop of harmony and good fellowship requisite for sustaining the interest and dignity of the agricultural cause. Thorough underdrainage," said Cornell with reference to his own administration, "speedily relieved the soil of this corroding influence." That same year Cornell established the Ithaca Farmers' Club which he provided with a reading room over the post office "kept open and warmed daily" for all who chose to visit. A dozen current agricultural periodicals and the principal New York papers were on hand there, almost certainly at Cornell's expense. In 1860, when he was both president and corresponding secretary, the organization met each Friday evening and its library contained 1,500 volumes.⁶⁶ Local farmers' clubs were not unusual at the time. The *Transactions of the New York State Agricultural Society* listed fifty-two town agricultural societies in 1858 and seventy-one in 1860. It is unlikely, however, that many of these were, like the Ithaca Farmers' Club, completely overshadowed by the patronage of their founder.

By 1860 Cornell had built up, largely by purchase, a prize herd

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of Shorthorn and Devon cattle. In 1858 he took first prize at the state fair for his Shorthorn bull and in 1860 for his Devon bull.⁶⁷ Yet it is doubtful if these and his other prize animals were of much consequence in improving Tompkins County agriculture. Even if they wished to do so, few farmers were able to follow Cornell's example. Moreover, it is probable that many were offended by Cornell's exhortations delivered through the pages of the *Ithaca Journal and Advertiser* urging them to improve their methods of farming. These letters, which appeared frequently after 1858, were paternal, if not sometimes patronizing in tone. Yet, withal, Cornell was a strong booster of Ithaca and Tompkins County; his patent dedication to this cause must have tempered much antagonism aroused by his great wealth, vast enthusiasm, and trenchant wit.*

Cynics who noticed how frequently Cornell's letters appeared in the local press during 1859 and 1860 may have guessed that he was preparing to run for public office. In September of 1860 alone four letters appeared describing his journey to Quebec, and each occupied nearly two full columns of the four-page paper. That November, Cornell was elected to the New York State Assembly, running well ahead of the rest of the Republican ticket.⁶⁸ He was reelected to the Assembly the following year, then represented Tompkins County four years in the state Senate.

Cornell was a keen observer of agricultural affairs. If, in the 1860's, his wealth from Western Union made him something of a "gentleman farmer," his earlier years had given him substantial practical experience. He kept careful records and, with the exception of his purebred animals, tried to make his farm operations pay their way—a difficult goal for one constantly trying new ideas. He was fascinated by statistics and was familiar with the idea of using a randomly selected, or as he said, "promiscuously selected," sample as a model of the universe from which it came. Disgusted with the "gross errors" in the reports on Tompkins County agriculture made by the enumerators for the United States census of 1860, Cornell directed his own census

*Cornell did not conceal his contempt for those not dedicated to the improvement of society; they were, he said, "mere drones in the great social hive" (*Trans.*, 1859, p. 555; Philip Dorf, *The Builder: A Biography of Ezra Cornell* [New York, 1952], pp. 207-217).

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of the county by having competent members of the county agricultural society canvass their school districts. The results of this canvass, published in the *Transactions* for 1860, presented a more favorable picture of Tompkins County agriculture than did the data which appeared in the census of 1860. The following year Cornell used these data, after making allowance for statistical error, to demonstrate that farmers in the county were operating at a profit. He found additional confirmation by examining county records; many farmers, he discovered, were investing their surplus in western land mortgages. In 1862 Cornell secured legislation for the collection of agricultural statistics throughout the state in the manner of his Tompkins County census.⁶⁹ The legislation proved unworkable, however, for Cornell's system demanded a degree of skill and motivation not present in all counties.

Early in his farming experience Cornell noted the relationship between the price of corn and the price of hogs, and in 1862 he drew some equally sage conclusions on the subject of cattle feed lots. Bringing food to cattle rather than allowing them to roam over pastures seemed to Cornell highly advantageous, for expensive fencing was avoided, manure was better preserved, and animals were enabled to make more efficient use of forage. "I do not urge an indiscriminate destruction of fences, or a rash and imperfect adoption of the practice," stated Cornell, who then appreciated how readily farmers dismissed even minor reforms. "What I advise is, that farmers should reflect upon this subject, and wisely prepare themselves for a change that must come sooner or later."⁷⁰

As president of the New York State Agricultural Society in 1862, Cornell represented the organization at an exhibition of the Royal Agricultural Society in London and, while in England, visited the experimental farm of Lawes and Gilbert at Rothamsted. In addition, he made extensive observations of British agriculture. A good reporter, Cornell arose at five one morning to record some of these observations in a "short letter" for the readers of the *Country Gentleman*.*

*Cornell's "short letter" occupied two pages when reduced to the small print used in the *Transactions*. His report on the Royal Agricultural Society exhibition and his visit to Rothamsted required thirty printed pages (*Trans.*, 1862, pp. 115-117; 1863, pp. 673-703).

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Traditions connected with the presidency of the society made it almost mandatory for the incumbent to aid the New York State Agricultural College. The five presidents prior to Cornell had been active officers of the College, and he was undoubtedly expected to evince a similar interest. In his presidential address to the society, delivered in February, 1863, he noted the passage of the Morrill Act and suggested, by implication, that greater state aid to agriculture would be a sound social investment. Countering the charge that farmers were "sturdy beggars" adept at raiding the state treasury, Cornell pointed out that state aid to agriculture over the past twenty-two years had averaged only \$7,278 per annum, exclusive of printing the *Transactions*.^{*} In 1863 Cornell did no more than state a position; his time was occupied with the construction of the substantial library building which he gave to the citizens of Ithaca.⁷¹

As the 1864 session of the legislature opened, it was evident that the supporters of the People's College would be unable to meet the conditions set for receipt of the Morrill land grant, and on January 12, Senator Cornell introduced a bill to divide the proceeds of the Morrill Act between the People's College and the New York State Agricultural College. This measure was opposed by Andrew Dickson White, then a freshman senator from Syracuse, whose chairmanship of the committee on literature gave him jurisdiction over matters concerning education. It was Senator White's position that the entire Morrill grant should be kept together in order to provide adequate support for a single first-rate institution. By parliamentary maneuver White prevented Cornell's bill from reaching a vote during the session.⁷²

That September, Cornell took a step consistent with his interests in the improvement of agriculture and the development of Ithaca. At a meeting of the trustees of the Agricultural College, to which Senator White was invited, Cornell offered a farm of 300 acres and a donation of \$300,000 if the trustees would transfer the location of the College to Ithaca and the state would endow it with an annual income of \$30,000, to be derived from the Morrill land grant. To the trustees the

^{*}Cornell found that about one-third of the \$8,000 appropriated annually for the state and county agricultural societies remained in the state treasury, since many counties lacked societies or failed to match the state appropriation with local funds (*Trans.*, 1862, pp. 22-23).

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offer represented release from financial embarrassment, but to Senator White it represented division of the land grant. Again he insisted that the entire Morrill grant should go to a single institution. He remembered stating, however (whether at that time or later is not entirely clear), "that if Mr. Cornell and his friends would ask for the *whole* grant—keeping it together, and adding his three hundred thousand dollars, as proposed—I would support such a bill with all my might."⁷³

Fate, it is commonly said, makes strange companions, but rarely does it bring together two such unlikely colleagues as Ezra Cornell and Andrew D. White. White was then thirty-one years old, the youngest member of the Senate; Cornell at fifty-seven was one of the oldest. White came from a wealthy family whose sound political connections made him eligible for the chairmanship of the committee which dealt with education; of Cornell's larger fortune no part was inherited and his chairmanship of the committee on agriculture was earned by service to the cause of agricultural improvement and the advancement of the Republican party. White had enjoyed the best education available at the time; Cornell was largely self-educated. Yet these obvious differences were less important than their agreement on a fundamental issue—the need for reform of higher education in the United States. Although they differed on the details by which the concept would be transformed into an operating educational program, they shared the belief that higher education must contribute to the further development of science and technology.

White had long been deeply interested in education. Before entering the Senate, he spent five years teaching history at the University of Michigan, where, as he relates in his *Autobiography*, he was impressed with the educational concepts of its president, Henry Philip Tappan. There he developed a plan for a university in his home state which would "afford an asylum for *Science*" and be "worthy of our land and time." Only funds were lacking. White was ready to contribute his own substantial fortune, but for the broad scheme he had conceived this was clearly insufficient. Writing to Gerrit Smith in 1862, White offered his "fortune and life" if Smith would join in developing his projected university.* This Smith was unable to do,

*Sept. 1 (Andrew D. White Papers). White made no provision for agricultural education in his projected university.

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and White's plans remained dreams. Then, in 1864, Ezra Cornell and the Morrill Act offered White another opportunity to establish his university.

The Morrill Act was in many ways an ideal instrument for Andrew D. White. The type of higher education he advocated was more expensive than the textbook instruction it would replace; federal aid provided by the act would help secure the equipment and support the maintenance of this new education. The Morrill Act provided federal aid without federal control. Each state was free to allocate the benefits of the grant to whatever institutions it wished, subject only to the requirement that provision be made for instruction in agriculture and the mechanic arts. This provision, later a source of considerable controversy, stated that each state must devote the funds derived from the act

to the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.⁷⁴

Acting under this provision, the legislatures of some states, and of this group Michigan and Iowa are outstanding examples, awarded the benefits of the land grant to state institutions which were primarily agricultural colleges; other states, such as Wisconsin and Connecticut, assigned the land-grant income to institutions having the scope of universities. In Wisconsin a state university was the recipient; in Connecticut the grant was assigned to privately controlled Yale College.

By the time the 1865 session of the legislature opened, White had persuaded Cornell to subordinate his interest in agricultural education to the founding in Ithaca of the university White had so long desired. Before them lay the task of persuading the legislature to assign New York's share of the land grant to the embryonic Cornell University. This action by the legislature would deprive the People's College of what it had already won, and this Charles Cook, no longer a senator

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but still politically powerful, was unwilling to permit. In opening the issue of reallocating the land grant, Cornell and his associates faced the possibility that a number of small colleges—most of them sectarian—would secure a portion of its benefits, a situation made more likely by the frustrations of those who still supported the People's College and the New York State Agricultural College. To secure the result he desired, Cornell hired Amos Brown to promote his bill in the lobbies of the legislature. Brown was willing to do this, for he had long since concluded that the People's College would not materialize and he apparently hoped to get a position on the faculty of the new university. Cornell later stated that Brown had rendered him great services, which he paid for in accordance with a definite understanding. Among these services was the suggestion, adopted by Cornell, to weaken the opposition generated by supporters of the People's College and the New York State Agricultural College by appointing some of their more influential trustees to the board of the new institution. There is some evidence that it was Brown who made the arrangement whereby Cornell paid Genesee College \$25,000 to establish a chair of agricultural chemistry, in return for which its supporters withdrew their demand for a share of the land grant. By these and other measures a small group of men, dedicated to a concept of higher education calculated to meet the needs of the time, obtained the opportunity to implement their convictions.* The bill incorporating Cornell University as New York's land-grant institution was signed by the Governor on April 27, 1865.

It is doubtful whether many members of the legislature recognized the issues at stake when they voted for that legislation, for by it they at once placed agricultural education in a privately controlled institu-

*The bargain with Genesee College and other steps taken to secure the incorporation of Cornell University are described in Becker, *Cornell University*, pp. 90-107, and Andrew D. White, *Autobiography of Andrew Dickson White* (New York, 1905), I, 296-334. Brewer, who knew both Cornell and Brown, indicated the part Brown played in getting the Cornell charter in his letter to W. T. Hewett, March 11, 1894, Brewer Papers, MF. When Brown later submitted a bill to Cornell University for services rendered in securing passage of the Morrill Act, a group of trustees attempted, unsuccessfully, to obtain for him a position on the faculty (*Cornell University Trustee Proceedings*, Feb. 13, 1867, p. 12 [hereafter referred to as *Trustee Proc.*]).

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tion and in a university context. In shifting to Cornell University the responsibility for agricultural education that Governor Clinton had insisted was the proper province of the state, the legislature acted consistently with its own traditions but also placed a privately controlled institution in a highly difficult position. In making Cornell University its land-grant institution, the state assumed a certain responsibility toward it; by accepting the land grant, the University assumed a certain responsibility toward the state. Beyond the few specific requirements stated in the Charter the relationship between New York State and Cornell University has never been clarified; rather it rests on the administrative decisions of those representing the interests of the state and the University and on laws and court decisions concerning immediate and pressing situations. The absence of a clearly defined framework has posed both danger and opportunity for education at Cornell, for in this situation much has depended on the personal qualities of those occupying key roles in both state and university government.

In this connection two provisions of the Charter have acquired a special significance. The provision which made available 512 free scholarships grew out of the idea that the University should have close contact with the secondary schools of the state. This number, later increased to 600, required a substantial financial outlay by the University and in later years provided the basis for a university claim for state aid.* The provision for ex-officio trustees broadened the University's base of support but left power in the hands of those trustees who took an active and continuing interest in its affairs. Farmers, the largest occupational group in the state, were represented on the Board of Trustees by the president of the New York State Agricultural Society; the public at large by four state officials, the governor and lieutenant-governor, the speaker of the assembly, and the superintendent of public instruction.⁷⁵

The legislature's work completed, an early task facing the Board of Trustees was to outline the new education in terms of courses and professors. A committee on organization was appointed, but the

*Fortunately for the financial position of the University, only a small number of these scholarships were filled during the early years by the county officials responsible for selecting candidates.

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burden of its work fell to its chairman, Andrew D. White. The philosophy underlying his report, presented in October, 1866, was that the essence of sound education lay in exposure to a broad variety of courses taught by able professors. Students concentrating on technical study such as agriculture and the mechanic arts (or, to use the modern term, "engineering") were expected to take other courses designed to liberalize their thinking by placing their technical skills and information in a larger educational context. Much emphasis was placed on substituting student electives for the rigidity of the fixed curriculum, thereby enabling each student to develop an educational program to meet his individual needs.⁷⁶

While White gave his attention to organizing the educational program, Ezra Cornell supervised construction of the buildings and organized the University's finances. Much effort was devoted to a plan he had originated, destined to be vastly successful, for "locating" western land with New York's land scrip, holding it for a rise in value, and then placing the proceeds in an endowment fund for the University.⁷⁷ Another task facing Cornell in his capacity as chairman of the Board of Trustees was the selection of a suitable candidate for president of the new institution. In spite of the surprise he reports having felt, Andrew D. White did not refuse the position.⁷⁸ On his shoulders fell the burden of implementing his report on organization.

The Beginning, 1868-1880

JUDGED by modern standards, conditions were primitive at the new university as it opened in September of 1868. The physical plant consisted of two permanent structures, Cascadilla Hall and University Building (later renamed Morrill Hall). These two buildings, which served as classrooms and dormitories for both faculty and students, are still in service, but today the chill of winter is tempered by central heating instead of numerous stoves fed by bucket-transported coal. A supplementary wooden building, a drafty structure, to be used as a chemistry laboratory was not yet completed. For the teaching of agriculture, the University utilized Ezra Cornell's barns, as the new institution occupied part of his cow pasture. The campus, with rough surface as yet untouched by grading, was divided by two streams; the one, turbulent Cascadilla Creek, had been only recently bridged, while the slippery bank of the other, located near the present site of Olin Hall, posed a challenge to student and professor alike. The view toward Ithaca and the lake revealed an eroded hillside, piles of waste rock from quarries near the present men's dormitories, and rambling rail fences.¹

The supply of water and removal of waste—matters we today take for granted—were the responsibility of each member of the university community. Cascadilla Hall at least had the advantage of water, supplied by hydraulic ram, which probably was drawn from the creek above the point where it could be contaminated by the slops dumped by students and staff alongside the building. A month after the University opened, the privies were still not completed at Cascadilla, and toward the end of October students living in University Building still had to carry their water nearly a quarter of a mile.²

Living conditions at the University, however, were comparable to those of most homes at the time. Much of the physical hardship of life at Cornell resulted from the efforts of getting there, for Ithaca

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was remote from any center of population and the University was hard to reach from Ithaca. From its wind-swept location the University was connected by a dirt road to the village then only beginning to extend up East Hill.

Until the temporary chemistry laboratory was completed in the spring of 1869, all space not already allocated to dormitories was utilized for classrooms. "The department of Geology was crowded into a room next to the coal cellar," recalled a member of the original faculty. "Chemistry performed its analyses under similar circumstances, while dissections and demonstrations in Natural History were conducted next to the furnace."³

Yet Cornell had a tremendous advantage in its very newness. For development of an invigorating sense of working together with faith in the future, there is no substitute for starting with new ideas and new buildings. In the excitement of implementing fresh educational concepts, Cornellians looked beyond their harsh physical environment to a brighter future. Secular at a time when most colleges were sectarian, emphasizing the study of science when the classics still predominated, resisting the educational authoritarianism of a fixed curriculum by permitting the student to elect subjects, in these and other ways the University was building from the ground up. The attacks of the traditionally minded, and these attacks were extensive and frequently vicious, served to bind together those who had already chosen Cornell University and to advertise its existence to teachers and students who were seeking something different in college education. It was the denunciations of ministers which brought Cornell University to the attention of John H. Comstock and Simon H. Gage, later to stand among its most illustrious professors.⁴

In selecting a faculty, President White was forced by limited finances to rely on young men of promise. Some, such as James Law and Burt Green Wilder, had already established reputations; President White's good judgment was proved by the forty years of effective service each gave to the University. To supplement the young faculty White brought to Cornell a group of illustrious teachers as nonresident lecturers. Among these were Louis Agassiz, James Russell Lowell, Goldwin Smith, and John Stanton Gould. The work of these men stimulated the students and resident faculty, and their presence,

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usually at substantial financial sacrifice, was an expression of their confidence in the new university.⁵

In selecting a faculty, as in almost every other area of university administration, the subject of agriculture posed special difficulties. A new subject in college curriculums, it was beset with the usual problems attending the introduction of new subjects, compounded in this case by antagonism toward technical studies both within and without the University. Its advocates disagreed over the objectives to be pursued, and its critics questioned whether it properly belonged in a university at all. There is little reason to believe that President White was interested in agricultural education; indeed, much evidence indicates the opposite. It had no place in his ideal university in 1862 and barely received passing mention in his report on organization. Nevertheless, White could not exclude this field of study from the University's curriculum, since it was Ezra Cornell's special interest and one of the few requirements stated in the Morrill Act for receipt of the land grant. Clearly, this was not a textbook subject; the books published before 1868 on agriculture as conducted in the United States did not collectively encompass the information on agricultural science and practice which then existed. The proper techniques and content of instruction in agriculture were an open question.⁶ But if agriculture itself was so difficult to establish in the curriculum, it was generally agreed that other subjects were of particular relevance, especially botany, agricultural chemistry, and veterinary medicine. It was in these areas that White began the selection of his faculty of agriculture.

A natural place to turn was the existing agricultural colleges, which had recently gone through the same difficult process of accumulating a faculty. From the State College of Pennsylvania, White obtained ✓ George Chapman Caldwell as professor of agricultural chemistry, a fortunate opportunity for both Caldwell and Cornell University. Shortly before his correspondence with White, Caldwell recorded his dissatisfaction with his situation in Pennsylvania: "Nearly two years since an entry has been made in my diary and here I still am at the Agricultural College of Pennsylvania—not because I am wholly contented, but that there seems no other place for me and I cannot endure to be without work."⁷ Caldwell was educated at Harvard and

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Göttingen, a background which must have impressed White, who much admired things Germanic. Certainly, he soon had White's confidence, for hardly had Caldwell arrived in Ithaca when the President sent him off to Michigan Agricultural College to hire a professor of botany and a professor of agriculture.⁸

At Michigan, Caldwell looked over the work of Manly Miles and reported that he was far and away the best available candidate for professor of agriculture. Caldwell offered Miles the maximum salary and promised cooperation in any experiments he might conduct at Cornell—correcting a situation which Caldwell said Miles did not enjoy at Michigan—but Miles proved unwilling to leave, whatever the inducements. Caldwell did secure Albert N. Prentiss as professor of botany, again offering the maximum salary of \$2,250 to a very young man because of another offer Prentiss had received from the recently organized Iowa Agricultural College.⁹

Some three months before this, White had embarked for Europe with the aim of persuading James Law of the British Royal Veterinary College to join the Cornell faculty, but in June White was pessimistic about getting him. Writing to Cornell, he said, "The rock on which we shall split will probably be the salary—still I will screw my courage up and do everything I can." A month later White reported success; he had secured Law on "exceedingly favorable terms," \$2,250 until his outside income reached \$500, then \$2,000 thereafter.¹⁰ This arrangement was exceptional, for professors were generally expected to devote their full services to the University.

The ease with which these men were secured and their subsequent success at Cornell contrasts sharply with the experience of those who occupied the professorship of agriculture. When Professor Miles refused the position, White returned to his original choice, Joseph Harris, an agricultural journalist of Rochester, New York. Harris had gained some prominence for his articles in the *Genesee Farmer*, which were based on his own farm operations. The series "Walks and Talks on the Farm" were interesting accounts oriented toward farm management.¹¹ Harris was a rare man in having established a reputation for making farming pay and being able to communicate his management methods to others. There was every reason to consider him an ideal person to develop agricultural education at Cornell.

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The relationship between Harris and Cornell University was confused from the beginning and developed into something of a comedy of errors which illustrated, if nothing else, the scarcity of qualified professors of agriculture. Ezra Cornell and White first approached Harris at the New York State Fair at Buffalo in the fall of 1867 and found him receptive to the appointment. Writing to Harris in October of that year, White said: "Your letter has greatly gratified me . . . You shall be appointed. I believe you to be the best man for the place—and know of no other so well fitted for it." White then revealed something of his lack of understanding of agricultural education by indicating how simple he considered the job to be. "Tact—indeed will be demanded but not very much 'management' in your department, I think." Confident that he had located his professor of agriculture, White turned to completing the faculty.¹²

When the trustees made the appointment on February 13, 1868, Harris, much to White's dismay, accepted a much higher offer from the Orange Judd Company to prepare his "Walks and Talks on the Farm" for the *American Agriculturist*. Quickly, White compiled several pages of reasons why Harris should reconsider, concluding with:

But if you cannot or do not wish to dispose of your farm and commit yourself *irrevocably* to our work, can you not, *ought* you not, to give us *one year*. It would be of great value to us . . .

Cannot you make this small sacrifice to so great a work. The Cornell University is to be a success, a *great* success, and I would most earnestly ask that you relieve us from this unexpected embarrassment.

I am confident that you will never regret it. It seems to us that pleasure, interest, and duty combine to draw you to this place.¹³

Spring was coming, forcing the commencement of farm operations at the University. With no resident professor of agriculture available, White and Cornell accepted Harris' counter offer to manage the work in agricultural education through occasional visits to the University.* The unsatisfactory nature of this arrangement was soon all too evident, and by August, White was again begging Harris to reside in

*This arrangement is described in a letter from Harris to White, c. Sept., 1868. There is no reason to doubt that White approved it, for parts of this long letter claiming payment of salary are supported by other evidence. The trustees rejected Harris' claim for compensation.

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Ithaca or, if he could not do that, to help persuade Professor Miles of Michigan to accept the position. Two months passed, and the University opened without a resident professor of agriculture. In late October, White again wrote Harris, desperately asking "advice as to men for the place." Apparently, competent professors of agriculture were as scarce as in 1849, when Andrew Jackson Downing wrote, "They must be sought for and carried off by violence, and made to understand that the State has a noble work for them, which she means to have rightly and well done."¹⁴

The University was little more successful in attracting students to its College of Agriculture. The *First General Announcement* indicates that White and his colleagues were well aware that securing students would be difficult. To dispel the popular belief that farming, by its very nature, would not pay, the *Announcement* stated that the work in agriculture would be "tried by an economic test"; Professor Harris was described as one who had "succeeded in applying science to agriculture in a common sense way and in *making it pay*." At the same time it was stated that "special attention will be given to the education of young men, ambitious to become instructors and professors in the numerous agricultural colleges now rising in nearly all the states of the Union." Finally, courses for two and three years were offered, in addition to the four-year course. The "agricultural community," it was believed, would regard with special interest these shorter courses containing the more purely agricultural work.¹⁵

Of the 412 students registered during that first year, only thirty were in agriculture. According to the *Cornell Era*, "a very large share" of these were city boys who "know nothing of farming and have romantic notions of what can be accomplished in farming." A writer in that magazine pointed to the unprofitable nature of farming as the principal reason for the small number of agricultural students. This was undoubtedly an important factor, for many students endured poverty at Cornell only in order to escape further contact with it. A month after the University opened, the treasurer proposed to deduct fifty cents a week from the board of students who would use water instead of tea or coffee, and a brief examination of his account book shows similar examples of student need.¹⁶ Such hardship was made endurable by promises of a brighter future, but farming did

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not seem to present this opportunity. The rare agricultural student who worked his way through Cornell was interested in improving agriculture by instructing others rather than by farming himself.

The agricultural press discouraged farmers from sending their sons to Cornell. Luther Tucker, distinguished among such editors for supporting the development of agricultural colleges, criticized Cornell for relegating agricultural education to a minor place in the curriculum.¹⁷ More typical was a statement in the *American Agriculturist* the year before the University opened:

The few agricultural schools that have been started have not done much to dispel the popular prejudice against agricultural education. The abiding conviction of farmers is, that education beyond the rudiments is a dangerous thing for a farmer's son, and if he attempts to master the science of his calling, he is pretty sure to have a call to some other business soon after he opens his books. The great majority do not believe a young farmer can have any education, to fit him for his business, half as good as that he can get upon the farm.¹⁸

This glorification of the farm as the place to learn farming made little sense to Professor Law. He knew from his European experience that agriculture could be profitable if correctly practiced. Failure on the good land in New York he blamed on such practices as lack of crop rotation, waste of manure, inbreeding of cattle, feeding of poor hay and cold water, and milking but twice a day.¹⁹ Yet it is doubtful if a student who accepted Law's indictment could have seen better practices on Cornell University's farm.

This farm was intended to supply the principal articles of food used by the students, but by June of 1869 it had "shown no income beyond the sale of a few raccoon skins and the milk which is furnished to the boarding house."²⁰ A sorry group of animals had replaced Ezra Cornell's prize cattle; the poorest cow yielded at its best only twenty-six pounds a week, or less than a quart at each milking. The farm manager added: "Since the 15th of July no grain has been fed. Seven of the ten cows have had foot rot." The foot rot, he thought, would be corrected soon, "as we are about to have stables with a dry floor."²¹ The following summer Vice-President William C. Russel regarded the farm as "the most dangerous point in our arrangements:"

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Thousands of Canada thistles with seed vessels just bursting and ready to send the seed of future thistles into our neighbors' and our own fields far and near; fields mown in a slovenly manner, the hay filling all the fence corners; fields which had been cleared of their crops of weeds because no grain had been planted on them; pastures without fences; in fine a farm without manure, without fences, without proper culture, a sample of unthrift, improvidence and waste.

I have seen a farm which, if any smart farmer who could write well should describe it to the public, would inflict on us a disgrace we could hardly throw off in many years . . .

For Heaven's sake let us do something.²²

The absence of effective supervision was all too evident, but by the summer of 1870 the University had still not located a professor of agriculture. To fill the gap, Lewis Spaulding had been made assistant professor of agriculture and director of farm in February, 1869. Spaulding had studied history under White at the University of Michigan, and, in 1867, White thought of him as "really a noble fellow," who could help Professor Harris as "sort of Asst. Prof.—half farmer—half professor."²³ Whatever Spaulding's merits as an agricultural educator, he was soon incapacitated by ill health and was succeeded in October, 1870, by Allen B. Benham as director of farm. Benham, a farmer from Dryden, had described himself to Ezra Cornell as a practical man who had made money and enriched the soil, "although much of my life has been spent in groveling darkness and ignorance of a scientific knowledge."²⁴ Actually Benham was being unduly modest. An unusually competent farmer, he had been president of the Tompkins County Agricultural Society and in 1860 and 1863 received the \$50 premium from the State Agricultural Society for the excellence of his farm management. Unfortunately, he did not manage the university farm with the same efficiency, perhaps because he lacked a personal interest in its development and the guidance of a resident professor. The previous winter George Geddes had been elected professor of agriculture but had declined the position on the grounds of age and ill health, a declination that was probably fortunate for the University in spite of Geddes' recognized abilities as a farmer and writer on agricultural subjects. John Stanton Gould, trustee of the University and White's advisor in

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selecting the faculty, praised Geddes as an agriculturist but warned of his inability to get along with others. This turned out to be good advice. Geddes' defense of agricultural education at Cornell, prepared in 1869, was countered in 1872 by what Gould called "a furious diatribe" against it.²⁵

Benham's effectiveness as director of the farm was also limited by conditions beyond his control which had existed since the University opened. Among them was the plague of student labor, a consequence of Ezra Cornell's promise to provide work for those students who otherwise would not be able to attend college. The total wages paid students for work on the farm averaged over \$200 a month during 1870-1871, which at existing wage rates amounted to some two thousand hours of labor. Many of the boys had no knowledge of farm work and were very inefficient. During those first three years, when the farm absorbed about one-fourth of the student labor at the University, the farm manager must have spent much of his time keeping the boys out of trouble. A resolution of the trustees, passed at the request of the President, reserved farm labor for students, which suggests that at some time in the past the farm manager had rid himself of some unwanted help by hiring outside workers.²⁶ At a time when the virtues of manual labor were widely proclaimed, Ezra Cornell could proudly declare that one state, at least, "has a farm of 100 acres that . . . is worked by students entirely."²⁷

There is another side to the matter of student labor. David Starr Jordan, later President of Stanford University but once a scholarship student who worked on ditching and grading around the foundations of McGraw Hall, recalled that "the report that a student without money could pay his way soon brought to the new institution very many extremely able men."²⁸ Future entomologist John Henry Comstock husked corn near the present site of Baker Laboratory for three cents a bushel. Future horticulturist William R. Lazenby, while working on the university farm three hours a day plus six hours on Saturday, earned the Founders' Prize of fifty dollars for "the student in Agriculture working on the farm, who without neglecting his other University duties, shall show himself most efficient, practically and scientifically upon the University farm."²⁹

Whatever its value in aiding needy students, the exclusive use of

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their labor on the farm had an unfortunate effect on the farm management by increasing labor costs, thereby decreasing funds available for other requirements. The farm manager could do little more than clean up the fields, as Vice-President Russel noted when he decried the sorry state of the farm. Entries in the treasurer's account book indicate that he thought of farm management in terms of utilizing deposits in the university privies and waste swill from the kitchen. "An Agricultural College must economize this material," he had stated.³⁰

The farm situation was so bad by the summer of 1871 that students were complaining to Russel. The Vice-President, who was carrying on during one of White's numerous absences from the University, was relieved to be on the trail of another professor of agriculture.³¹ This one turned out to be Henry McCandless, a young graduate from Glasnevin in Ireland, who was later remembered by his successor primarily for his good looks and good grooming.* McCandless, too, was a failure, but for different reasons than his predecessors.

McCandless wished to use the British system as a model for agricultural education, at that time a realistic goal if the development of new knowledge through research were to be emphasized, for Great Britain was much more advanced in agricultural research than the United States. Indeed, both White and Cornell had visited British and other European agricultural colleges in 1868 with the hope of bringing home some useful ideas. However, if agricultural education were to be closely related to New York agriculture, British practices based on an abundance of inexpensive labor were largely irrelevant. Root crops, so important to European agriculture, had been almost abandoned here, and corn, the staple of New York farms, was practically unknown in England. McCandless proposed to establish a Scottish farm, and for this purpose fifty acres were set aside and the remainder of the university farm rented to Benham on a crop-sharing basis. Determined to get the work in agriculture under way, Ezra Cornell personally furnished the money to build the special barn McCandless desired, the trustees set aside \$1,000 for the operation of his model farm, and a number of implements were imported from Ireland. When this equipment was assembled and the building completed,

*Isaac P. Roberts, *Autobiography of a Farm Boy* (Albany, 1916), p. 180. This is an interesting account of Roberts' experiences in Iowa and New York.

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McCandless suddenly resigned. In several petulant letters to White and Cornell, he complained of his low salary and lack of authority, apparently feeling that these conditions justified breaking his agreement not to resign without ample notice.³² "If anything is said about the Agricultural Professorship," White wrote to his friend, D. Willard Fiske, "it may be well to mention that the vacancy was caused by his promotion."³³ On leaving Cornell, McCandless became head of the Provincial Agricultural School in Guelph, Ontario, where he stayed two years before being dismissed.³⁴

The departure of McCandless marked a critical point in the development of agricultural education at Cornell. Buildings and equipment of little value to anyone else remained as a reminder of more promises unfilled. It became increasingly more difficult to square the pretensions made for the College of Agriculture in the university announcements with the all too obvious condition of the university farm, and local farmers, already suspicious, had been further alienated by McCandless' habit of wearing kid gloves and refusing to touch farm implements.³⁵ The state superintendent of public instruction had reason to ask, "Can we reasonably hope to make the *Agricultural College a success?*"³⁶

President White originally planned to maintain a political and religious balance in the faculty but had long since given up these qualifications in selecting a professor of agriculture.³⁷ After the McCandless experience, White and Russel reviewed applications submitted several years earlier in response to their advertisement for a professor of agriculture. From this source and from other suggestions, they compiled a new list of possibilities, ranging from a candidate with "really extraordinary qualifications as to foreign experience" to a recent graduate of Yale.³⁸ They also considered dividing the position and hiring two young men, one to lecture and the other to conduct experiments in feeding cattle.³⁹ At this point a solution appeared from an unexpected direction, and Cornell soon benefited immensely from the folly of the trustees of the Iowa Agricultural College.

That institution was undergoing one of its recurrent clashes between a group of trustees and members of the faculty and administration. One result was that its professor of physics, William A. Anthony, came to Cornell with a strong suspicion that his colleague Isaac P.

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Roberts, professor of agriculture, was also ready to make a change. On seeing something of the crisis at Cornell, he wrote to Roberts asking him to submit a plan for the organization of a college of agriculture at Ithaca.* Ezra Cornell and other trustees were so delighted with Roberts' plan that they immediately dispatched Professor Russel to Iowa to interview him. President White was interested in another candidate, but Caldwell would not consent to his appointment until Roberts had been seen.⁴⁰ Professor Roberts proved to be an ideal choice. This practical farmer turned teacher was familiar with New York agriculture from his youth in Seneca County. He made things go from the day of his arrival. ✓

Developments in agricultural education were so rapid thereafter that it is easy to overlook the earlier contributions of other members of the faculty. During 1869 Professors Caldwell, Law, and Prentiss found time from their resident teaching for lecturing to groups of farmers about the state. This may be regarded as the beginning of extension work at Cornell, a natural development of the desire of the more progressive farmers for new information and of faculty willingness to communicate what they believed to be important. During that first year farmers in the state looked over the Cornell faculty, and by the winter of 1869 the New York State Dairymen's Association had arranged for lectures by these three professors. In February of 1870 Law was scheduled to speak to the New York State Agricultural Society.⁴¹

As a nonresident lecturer, John Stanton Gould provided unity and direction in agricultural education in the years before Professor Roberts arrived. A personal friend of both White and Cornell, this classically educated scholar was deeply interested in scientific agriculture. His journal shows that he viewed science as an avenue through which the endless inquiries arising from his observations could be systematically considered.⁴² An agricultural college, he felt, should be no mere manual-training institution; rather it should deal with basic principles and add to existing knowledge. Toward this end he set out on a modest program of research with the aid of Ezra

**Ibid.*, pp. 169-171. Roberts incorrectly places this event in October, 1873. There are numerous such errors in the *Autobiography*, which he wrote from memory without the aid of documents. See pp. 9-10.

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Cornell and Farm Manager Benham. "I can assure you," wrote Cornell, in reply to Gould's inquiry about an experiment with potatoes, "that we will continue the experiment as long as any good will result from it . . . I have cooked and eaten from several varieties of those potatoes this winter, and I can give you a copy of the result whenever you want."⁴³

Professor Gould viewed agriculture as a framework within which a vast part of man's knowledge could be fitted. He believed that no man could be educated without some exposure to agriculture, and from this perspective he gave a series of lectures on "agriculture at large" to the entire senior class of the University. He also took the leadership in obtaining lecturers in the special fields of agriculture, trying first to find the best men and then, when necessary, attempting to overcome their fears about speaking before a university group. During the winter and spring of 1871, nine men promised to give a total of fifty-three lectures.⁴⁴ It was hoped that when these men of practical experience arrived at Cornell they would give advice on a permanent plan for the agricultural college. "I think too," said Gould, "that they will influence public opinion in our favor, and be a strong shield from the attacks of our enemies."⁴⁵ X. A. Willard, a nonresident lecturer, did not disappoint him. "I have never seen a more earnest and orderly set of young men. The University is really doing a great work," reported this pioneer dairy scientist in *Moore's Rural New Yorker*.⁴⁶

Possessed of deep faith in the future of agricultural education at Cornell, Professor Gould exercised a moderating effect on President White, who was inclined to vacillate between elation and despair. Reminding the President of the need to take a long view, he said about the time that Roberts was hired, "I am very sure the right man could make the Agricultural Department a power in the earth."⁴⁷ After Gould's death in 1875, a memorial window was erected in his name in the university chapel; and thirty years later, in assessing the importance of those who established agricultural education at Cornell, White would link his name with that of Ezra Cornell.⁴⁸ Although he was unquestionably a man of great ability, Gould's contribution to agricultural education at the University was limited by his age and the part-time nature of his service.

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Before the days of experiment stations and organized extension work, the number of students in residence was the popular measure of the success of an agricultural college. This matter of student enrollment was of special importance to Cornell University, for agricultural education loomed high among the purposes of the Morrill Act. A small number of agricultural students could be considered evidence by the University's critics that New York's share of the Morrill grant was not being utilized in the way that Congress had intended. Unfortunately the number of students in agriculture, small at the beginning, fell quite steadily until 1874, as the figures on student enrollment for the years 1868-1873 show:⁴⁹

<i>Year</i>	<i>No. in Agriculture</i>	<i>No. in University</i>
1868-69	30	412
1869-70	24	563
1870-71	20	609
1871-72	13	597
1872-73	15	539
1873-74	7	509

Although the University had advertised its work in agricultural education in the agricultural press as early as 1869, in the summer of 1873 the trustees authorized a further expenditure of \$200 for this purpose.⁵⁰ Meanwhile, President White, who knew the value of a good public image, made the less appear the more. He pointed to the lectures of Professor Gould which the trustees required all students to receive before they could graduate from Cornell.* This method of obtaining attendance went a long way to defeat the purposes of the lecturer, which were further compromised, as Professor Caldwell noted in later years, by scheduling the lectures during the spring term immediately after lunch period. Yet, if more than fifteen agricultural students were to be found at Cornell, these lectures must be counted as well as work in what was then called the Department of Natural History. A congressional report showed 112 Cornell graduates "in branches relating to agriculture" in 1872-

**Trustee Proc.*, Jan. 24, 1870, p. 43. After June, 1872, the faculty was permitted to grant exemptions from these lectures (*ibid.*, June 22, 1872, p. 67).

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1873 and, of the student body, 112 were classified "in agriculture."⁵¹

That only seven students were enrolled in agriculture during 1873-74 created a crisis in that area, but was only a single item in the investigation the state conducted into Cornell University affairs that year. The investigating committee had been appointed by Governor John A. Dix at the request of Ezra Cornell, who hoped to clear himself of charges made in the legislature that the University's endowment fund had been manipulated for his personal advantage. In the course of extensive testimony, the committee looked beyond the endowment fund into all aspects of the University's operations. Professor McCandless returned from Canada to vent his animus against Cornell, as his twenty-four pages of testimony before the committee readily reveal.⁵² In the end, Ezra Cornell's integrity was completely vindicated, but not before the University's handling of agricultural education had been subjected to extensive criticism.

Russel had anticipated that the committee would question the practical value to farmers of the agricultural work at Cornell. To forestall this criticism, he helped L. B. Arnold, secretary of the American Dairymen's Association, prepare an affidavit "showing we are teaching something valuable." The testimony of such responsible men was noted by the committee but not given the weight Russel had anticipated, for, according to the committee, "the institutions contemplated by Congress were not places for the diffusion, primarily, of knowledge among those already engaged in agriculture; they were to be schools for the young." For the committee, a more serious issue turned on the question of manual labor :

Any mechanical or agricultural course of study, of which continuance of manual labor on the part of the student does not form a prominent part, is defective, and does not contribute to carry out the purposes of the act of Congress. The habit of physical labor intermitted during the four years at College, will hardly be recouped in after life.⁵³

The investigating committee's interpretation of the will of Congress had wide support in the agricultural press and was in accord with the dominant point of view in the states of Iowa and Michigan.⁵⁴ According to its advocates, agricultural education emphasizing manual labor had the double advantage of teaching the necessary

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skills without educating the student away from the farm. This essentially conservative view was adapted to a static system of agriculture and was of questionable merit in 1874, when agricultural techniques were changing so rapidly. In states where separate agricultural colleges had been established, education emphasizing manual labor could be used to stabilize existing practices; but where the agricultural college was part of a university, the aims and methods of such education were affected less by existing agricultural practices than by the educational orientation of the larger institution. This method of organization was attacked by the *American Agriculturist*, which charged that the New York State legislature should never have exposed an agricultural college to adverse academic influences: "No matter if there be no outward assumption of authority on the part of those in the academic courses, farmers' boys do not like to be even in contact with those who are pursuing branches to which they can never hope to aspire, and they will not go where they can be looked upon as in a lower grade of scholarship."⁵⁵

Cornell's College of Agriculture, or the Department of Agriculture as it was called after 1874, was simply a group of men associated through similar academic interests without any implication of constituting a separate administrative unit. Its faculty in 1871 included seven professors, six of whom were members of other colleges as well. The position of dean was largely honorary, with nearly half of the University's nineteen full professors serving in that capacity. When McCandless complained about not being head of his department, Dean Caldwell scoffed about "the weight of the duties, honors, and emoluments appertaining to the office of Dean of the Faculty of Agriculture."⁵⁶ In actuality, the burden of instruction in agriculture was carried by the professor of agriculture, supplemented by Caldwell in agricultural chemistry, Law in veterinary science, and, later in the decade, Comstock in economic entomology and Lazenby in horticulture. In addition, Wilder in zoology and Prentiss in botany sometimes stressed agricultural applications in their lectures. However, the only person devoting his full time to agricultural education was the professor of agriculture.

Power at Cornell rested in three locations—the trustees, the president, and the faculty. Although the division of authority between

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them was anything but clear in the 1870's, it was certain that no individual professor, and least of all the professor of agriculture, could set standards for admission or instruction that were substantially lower than those of the rest of the faculty. So seriously was the academic respectability of agricultural education questioned that Professor Roberts' family, on moving into Cascadilla Hall in January, 1874, "suffered a sort of social neglect and felt ourselves in an alien atmosphere."⁵⁷ If Roberts was to prove himself at Cornell University, it would be by meeting the standards of his associates.

Agricultural colleges, President White declared in 1869, should take young men already trained in the processes of agriculture and, through developing their powers of observation and reasoning, turn them into first-class farmers.⁵⁸ The four-year program of Cornell's College of Agriculture was indeed oriented toward developing powers of observation and reasoning. Containing little that was related to the immediate processes of farming, its curriculum provided extensive exposure to the languages, science, and mathematics. During the first two years, German or French was required, along with English and mathematics; third-year requirements included agricultural chemistry, physics, and veterinary anatomy and physiology. Only in the final year were requirements in agricultural chemistry and political science supplemented by subjects of more immediate relevance to farming, taught by the professor of agriculture.

According to the *Cornell University Register*, Roberts delivered five lectures a week to the senior class throughout the college year. The term "lecture" suggests a greater solemnity than actually existed in these talks to classes of less than a dozen students. Roberts covered all phases of agriculture—animals, plants, soils, drainage, the use of machinery, buildings, farm accounts, and marketing—plus (and this is not in the *Register*) personal philosophy, good citizenship, and the matter of selecting a wife (a most important subject for a farmer!). On two afternoons a week Roberts met these students for three-hour practice periods when each tried his hand at field work and the feeding and handling of animals.⁵⁹

Such a curriculum with its brief exposure to applied agriculture was of little value for turning those without farm experience into farmers, but it was of substantial value for students desiring to

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specialize in a science related to agriculture. Those who graduated from the four-year program during the 1870's usually went on to develop agricultural sciences, such as horticulture and animal husbandry, at Cornell or other institutions. Not that this number was large. It was not until 1873 that Cornell produced its first graduates in agriculture: Charles Lacy and Loren P. Smith, a class of two, which number was not exceeded during the 1870's.

Lacy was admitted to the two-year agricultural course in 1869 with conditions in certain entrance subjects. Like other students who have entered since that time, he had only a vague idea of what college education involved and was fully convinced that he had enough education for a farmer when he entered but, spurred on by his parents and rivalry with a schoolmate, concluded after arriving that he could benefit from the full four-year program. After graduating he became professor of agriculture at the University of Minnesota, a position he later recalled was obtained less because of any special fitness on his part than because of "the scarcity of teachers having any training whatever" in the sciences related to agriculture.⁶⁰ Unlike Lacy, Smith turned to farming after graduation but later became professor of agriculture at Iowa Agricultural College. There his lack of familiarity with midwestern agriculture substantially reduced his effectiveness.⁶¹

Most students enrolled in agriculture stayed only long enough to take the courses they considered of immediate value. That only a small number graduated from the four-year program was viewed by critics desiring a more "practical" college of agriculture as evidence that the Morrill fund was being misapplied. This evidence was highly misleading for there were, among the twenty men who received the degree of Bachelor of Agriculture by 1881, several who made outstanding contributions to the further development of agricultural education. In the class of 1874 were William R. Lazenby, whose contributions to Cornell will be examined and John L. Stone, later professor of farm practice at Cornell, who managed the University's farms and instructed countless students in techniques applicable to northeastern agriculture. Two students who roomed together in White Hall, William A. Henry and Henry H. Wing, graduated in 1880 and 1881 respectively. Wing was to develop animal husbandry

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at Cornell, and Henry was for many years dean of the College of Agriculture at the University of Wisconsin, where he performed for that institution a function comparable to Roberts' at Cornell. Moreover, many Cornellians who received the Bachelor of Science degree contributed to the sciences related to agriculture and to the diffusion of agricultural knowledge in ways equally significant. Clinton D. Smith, '73, became director of the agricultural experiment station at the University of Minnesota and later at Michigan Agricultural College, where he resigned to become president of Brazil's first agricultural college. L. O. Howard, '77, was for over thirty years chief entomologist of the United States Department of Agriculture. William Trelease, '80, was director of the Shaw School of Botany at St. Louis for over twenty-five years. Daniel E. Salmon, who received his degree in veterinary science, became chief of the Department of Agriculture's Bureau of Animal Industry.⁶²

In every way—instruction of students, administration, and finance—the work in agriculture was part of the University, and its development was completely dependent on the general progress of the University. With the faculty selected, finances remained the crucial area, since the new institution required funds for both operation and expansion. In giving the first building for the College of Mechanic Arts, Hiram Sibley conferred a benefaction on agriculture by releasing some of the pressure on university funds. Appropriations for the work in agriculture were dependent at all times on conditions in the University because its funds were reallocated as crises developed elsewhere.⁶³ Sources of income were largely limited to student tuition and gifts from individuals, but tuition was set at only \$30 a year in order to attract students with little money, thereby serving the purposes of Ezra Cornell. Without alumni or enough wealthy friends to provide financial stability, the University was badly in need of a new source of revenue.*

In this need Cornell shared the predicament of land-grant institu-

*Tuition was increased by 50 percent in 1870 to \$45 a year (*Cornell University Register*, 1869-70, 1870-71). The Cornell Endowment Fund was not productive until Cornell's western lands were sold in the 1880's (Paul W. Gates, *The Wisconsin Pine Lands of Cornell University* [Ithaca, 1943], pp. 222-243).

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tions in other states. The situation was quite parallel to that which gave rise to the Morrill Act; clearly a solution to this financial crisis was a further conversion of national domain into endowment for the land-grant institutions. Bringing pressure to bear on Congress was easier at this point, since the interests of the state agricultural colleges were represented in the national government by the Department of Agriculture, created by Congress in the same year the Morrill Act was passed. In December, 1871, Frederick Watts, commissioner of agriculture, called representatives of the land-grant colleges and state agricultural societies to a convention in Washington to discuss "subjects of mutual interest." Professor Prentiss, who represented Cornell University along with Ezra Cornell and Professor McCandless, was disappointed that these mutual interests were reduced to "almost every effort being directed to the one purpose of obtaining more land from Congress."⁶⁴ The convention was most informal and was carried on in high good humor, broken only by occasional references to carpetbaggers as the conversation turned to the education of Negroes in the South. The convention was so loosely planned that no provision had been made for printing the proceedings, but its sponsorship by the United States Department of Agriculture, the attendance of Senator Morrill, and the emphasis on the need for further endowment of the land-grant colleges suggested the direction of more fully organized efforts in the future.* The immediate result was a bill for further endowment introduced into Congress by Senator Morrill and drawn, according to President Adonijah Welch of Iowa Agricultural College, "under the advice of Mr. Cornell." This Welch pointed out in urging President White to join him in Washington to support the legislation.⁶⁵

During the year prior to the Washington meeting a convention had been held in Chicago, attended by twenty-nine agricultural educators and journalists. The organization of this meeting was rather remarkable since it was arranged by seventeen men, widely

*Ezra Cornell offered to have the proceedings of the convention printed free of charge by the students of Cornell University (*Senate Misc. Doc. 164*, 42d Congress, 2d sess., 1872, pp. 66-68; True, *A History of Agricultural Education in the United States, 1785-1925* [USDA Miscellaneous Publication 36, 1929], pp. 194-195).

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separated geographically, who had a common interest in agricultural education. The purpose of the convention was to bring together agricultural educators so each could learn what the others were doing and especially to discuss recent developments in agricultural experimentation. For leadership in the discussion on the conduct and coordination of experiments the convention looked to Professor Manly Miles of Michigan. Miles was the leading—some authorities have said the only—professor of agriculture in the United States at the time; his understanding of experimental techniques clearly surpassed that of other men attending the convention.⁶⁶ Much useful information on agricultural experimentation was exchanged but, as developments later in the convention indicated, a sizable minority of its members was more interested in discussing coeducation and a system of agricultural education based on manual labor. When the convention returned to the principal subject, a resolution was adopted calling upon Congress and the state legislatures for the “speedy establishment” of agricultural experiment stations throughout the country.⁶⁷ This objective, however, was not to be accomplished until the next decade, when the forces leading to this convention merged with those which dominated the Washington convention of 1872.

Roberts had attended the Chicago conference. There he described the difficulties he and President Welch experienced at Iowa Agricultural College in conducting experiments. In stressing the danger of drawing conclusions from an experiment without repetition under a variety of conditions, he said that agricultural papers were the best means of communicating the experimental data necessary for replication in other states.⁶⁸ During the 1870's and later, these papers did perform this function but in a haphazard fashion, due to the necessity for catering to reader interest and the demands of advertisers. Nevertheless, when Roberts came to Cornell, these periodicals were the principal source of agricultural information. They could be supplemented by the transactions of the state agricultural societies and the few published proceedings of agricultural conventions. Beyond this, Roberts' knowledge of agriculture came from his experience as a farmer in central New York and in Iowa, from his conversations with farmers and fellow teachers of agricul-

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ture, and from his extensive correspondence.

The rudimentary development of means for the communication of agricultural information left each teacher dependent on his own resources, and in this situation Roberts' experience was of particular value. However, the informal nature of his education was a source of difficulty. At Iowa the absence of a college degree had been no handicap, but at Cornell this set him apart from the rest of the faculty. President Welch, well aware that the lack of a degree would reduce Roberts' effectiveness at Cornell, persuaded the faculty of Iowa Agricultural College to make him an honorary Master of Agriculture. The contrast between Roberts' educational attainments and those of other members of the faculty probably caused the unenthusiastic reception he received. Although successful at Iowa and bearing rather impressive recommendations from Welch, Roberts came to Cornell as an assistant professor, his arrival receiving no more than passing notice in the President's annual report.⁶⁹

On the other hand, the professorship of agriculture at Cornell offered great opportunity for this man of ability and energy who had faith in the future of agricultural education and sufficient psychological stability to withstand alienation by his colleagues. For one thing, the very lack of interest on the part of the trustees and most of the faculty assured him a free hand, within the limits of available finances, in developing the agricultural work. The year of his arrival witnessed the passing of Ezra Cornell and John Stanton Gould, and with these strong personalities gone, Roberts was free to build on or alter what traditions had been established in agricultural education. Even the lack of students was an immediate advantage, for Roberts could turn to the work he knew best, building the university farm and establishing contacts with the farmers in the state. A rural constituency, Roberts knew from his experience in Iowa, was an absolute necessity for a successful college of agriculture.

One of Roberts' early activities at Cornell was to inventory the holdings of the Department of Agriculture. This inventory lists the results of six years of mismanagement: animals old, thin, and sterile; tools too few and frequently broken; fences down so flat that "I do

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not think there is a single rod that would induce a cow to hesitate a moment if she desired to pass through, under or over"; no grain for seed; doors off their hinges; and manure leaching down to Cayuga Lake. With this inventory, Roberts presented a plan for the operation of the farm, saying, in a characteristic way, that his reputation could not survive present conditions.⁷⁰

Managing to secure an annual appropriation of \$7,500, an amount larger than he would receive again for the next ten years, Roberts set out to replace the herd of ten dairy cows which he had soon discovered was infected by tuberculosis and had within it only twenty-two milkable teats. The new cattle were the first occupants of Professor McCandless' barn, which Roberts said "never ceased to be a monstrosity."⁷¹

During that first year of repairing buildings and erecting fences, Roberts joined the Tompkins County Agricultural Society and the Ithaca Farmers' Club. The next year he was president of this club and, according to a report in the Ithaca paper, ran it with a firm hand: "Professor Roberts made some very suggestive remarks in regard to the best method of conducting the meetings of the club. He thought the speeches should be limited to ten minutes and that all ill-natured personalities and irrelevant talk should be promptly suppressed."⁷² Practical problems, such as the desirability of soaking seeds before planting and the kind of ground best suited for the production of potatoes, were the basis of discussion. Roberts was effective in extending agricultural knowledge, whether discussing planting potatoes with a group of local farmers or discussing the problems of agricultural experimentation before the New York State Agricultural Society.⁷³ Before his first year at Cornell ended, he was already broadening the understanding of men who farmed under a variety of circumstances.

Without publications to pave the way, establishing contact with farmers was a slow process. For Roberts to attend a meeting as close as that of the Ithaca Farmers' Club meant a lengthy horse-and-buggy ride, and if the meeting were any distance away, a rail trip was also required. Roberts was greatly aided by the appointment to the staff of W. R. Lazenby and Henry Comstock in 1874.⁷⁴ These men, appointed primarily to conduct resident instruction, realized

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that effective teaching in horticulture and economic entomology required a firsthand knowledge of the problems farmers faced in the production of plants and the control of insects. Comstock contributed to Cornell's reputation by helping New York farmers control insect damage. Lazenby worked successfully in the broader area of establishing working relationships between Cornell University and farmer groups. He may well be considered Cornell's first specialist in extension.

During the 1870's the primary purpose of the University was the instruction of resident students. If faculty members spoke to groups outside Cornell, these engagements were arranged personally, to be done outside of their university duties. But agriculture posed a special problem. The support of farm groups was necessary before farmers would send their sons to receive the agricultural instruction the University provided. The opening of the University had been postponed to avoid conflict with a meeting of the New York State Agricultural Society in the hope that the society's officers would attend the ceremony.⁷⁵ The relationship thus inaugurated was continued in the work with farm groups of Professors Caldwell, Law, and Roberts and reached its most formal expression in an appropriation for extension work by Instructor Lazenby.

Five months after this appropriation, Lazenby was a special agricultural correspondent for the *Ithaca Daily Journal*, publishing in that paper extensive reports of the agricultural conventions he attended.⁷⁶ At this time the Grange was making tremendous advances among the farm population of New York State.* In the enthusiasm of its early years, the Grange was vigorously active, dedicated to increasing the political and economic influence of farmers through collective action. In 1875 Lazenby was secretary of the Forest City (Ithaca) Grange. By 1877, when the Grange was a real power among the farmers of New York State, he was a delegate from Tompkins County to the second annual meeting of the State Grange. At that gathering a resolution was introduced calling for a legislative investigation of Cornell University on the charge, widely circulated in the agricultural press throughout the 1870's, that the

*There were 165 organized Granges in New York State in 1874, 341 in 1875. (*Proc. of the N. Y. State Grange*, 1874, pp. 5-9; 1875, pp. 68-72).

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University was subordinating agriculture to other interests. Lazenby, then only twenty-four years old, rose to the defense. Stating that one of the principal aims of the University was to help the farmers of the state, he defended the methods used and the work accomplished in agricultural education. As a result, the resolution demanding an investigation by the legislature was altered to provide for a Grange committee of three men who were to visit the University and personally examine its work. The committee appointed included the two men who had launched the attack on Cornell.⁷⁷

By this time the good work of Professor Roberts on the University's farms was evident and the Grange visitors who came to scoff remained to praise. Vice-President Russel was delighted beyond his hopes at the conversion of these two prejudiced Grangers, a conversion which turned out to be more than a passing fancy.⁷⁸ Two years later one of these men spoke at the annual State Grange meeting, following addresses by Professors Law and Roberts, to recall the investigation of 1877:

As a member of that committee I spent two days in looking through the various departments at Cornell, and I am glad to confess that I discovered that my prejudices were entirely unfounded, and that Cornell was prepared to accomplish wonders for agriculture, and that she needed more than anything else the cooperation of farmers. It behooves us to do all in our power to encourage the University in its work.⁷⁹

President White later called the Grange investigation a turning point in the affairs of the Department of Agriculture.* Roberts, too, was encouraged, saying, "I have faith to believe that we are at no distant day to take the lead in Agriculture in the U.S."⁸⁰ Shortly after the Grange visit, the trustees appropriated \$250 to Lazenby for "writing and publishing and attending conventions and addressing them."⁸¹

The increase in the number of students gave additional reason for optimism. During the dark days of 1874, Roberts had recommended the abolition of tuition for agricultural students. In approving this recommendation, the trustees were sufficiently impressed with the small enrollment to consider releasing agricultural students from

*White, *Autobiog.*, I, 370. White's account of the incident, however, is highly exaggerated and otherwise inaccurate.

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room rent as well.⁸² Free tuition, along with the improving relationship with farm groups, seemed to be the answer to attracting students, for the number enrolled in agriculture increased dramatically after 1873-74. At the same time, the quality of the students improved. It was no longer, as in 1874, Stone, Lazenby, "and a few strays in search of a snap,"⁸³ as student enrollment in the years 1873-1877 shows:

<i>Year</i>	<i>No. in Agriculture</i>	<i>No. in University</i>
1873-74	7	509
1874-75	18	532
1875-76	17	542
1876-77	29	561
1877-78	42	529

On this note Roberts took his first vacation from Cornell, spending the summer of 1878 in Europe studying agricultural methods.⁸⁴

While a larger number of students was necessary if certain critics were to be satisfied, the matter of student numbers was part of the larger question of the objectives of agricultural education. If the diffusion of existing knowledge were stressed, a large number of students was clearly desirable; if, on the other hand, the discovery of new information were to be stressed, a small number of students would give the faculty more time for investigation. Agricultural education at Cornell was skewed in the latter direction from the beginning through its association with a university curriculum heavily weighted on the side of the sciences. As early as 1871 Professor Caldwell pressed for the establishment of a farm to be used exclusively for the conduct of experiments; in 1874 President White announced its establishment in a speech before the State Agricultural Society.⁸⁵

At a later meeting of the society, the University was attacked with the claim that "real agricultural education can only be obtained on experimental farms controlled by practical farmers." Roberts rose to this charge. Pointing to the complexity of agricultural experiments and the difficulty of obtaining reliable results, he stated that agricultural experiments are the work of years and that failure is as likely as success. He added that two hundred varieties of wheat were then being tried, and in sixty experiments the relation of variations in soil

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and application of manure to wheat production were being studied. George Geddes, who had urged White to emphasize experimental investigation in 1869, secured the passage of a resolution by the society approving Cornell's experimental farm.⁸⁶

L. B. Arnold of the New York Dairymen's Association was already cooperating with Caldwell in dairy feeding experiments. In 1876 this association was negotiating with White for the establishment of an experimental center at Cornell, the University to furnish the building site, water, and faculty, the association to provide the building, equipment, and superintendent. The President's report for 1877 does not mention this plan but does include a plea from Professor Roberts for an assistant to help him maintain the 134 experimental plots and keep the necessary records.⁸⁷

Roberts operated the plots on which he conducted his experiments at a cost of \$268 in 1877. Even this small sum placed him on the horns of a dilemma, for he felt that Cornell's reputation with the agricultural press depended on extensive experimentation, while the University trustees had decreed that any expenditure in excess of their appropriation would come out of the guilty professor's salary. The experiments, said Lazenby, were of the type that scientific agriculture demanded. They were not simply tests to determine the most efficient seed or fertilizer, but studies aimed at discovering fundamental relationships. The visiting Grange committee approved the experimental work, but expressed some reservations about the way results were released to the public. Less concerned with fundamental principles than with immediate economic considerations, they questioned Caldwell's insistence on replication of experiments under a variety of conditions before releasing results. "It seems to us," they reported to the State Grange, "that if the results were given, accompanied by a statement of the circumstances attending the tests, the farmers might be trusted to make the proper inferences."⁸⁸

Meanwhile, the movement for the application of scientific techniques to agriculture was gaining impetus in other states. By 1877 experiment stations had been established with public funds in Connecticut and North Carolina, and in other states the advocates of agricultural experiment stations were formulating their claims to their legislatures.⁸⁹ Vice-President Russel, in preparing the annual

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report for 1877, noted that such a bill had been introduced into the New York State legislature. Anticipating that it would come up for consideration in the next session, he declared, "It is of vital importance to us that this station, if ever established, be located here."⁹⁰ From that time until he was dismissed from the University in 1881, Russel worked for the passage of an experiment station bill and, with this accomplished, tried to bring the station to Cornell.

The experiment station bill had been introduced in 1877 at the request of the State Grange, which contemplated an institution that would not only conduct agricultural experiments and publish the results, but would also test fertilizers, thereby protecting the farmer against the numerous fraudulent analyses then on the market. That the Grange had Cornell University in mind as a possible site is indicated by authorization for a committee "to confer with the managers of any existing institution which has accepted any National or State aid." The following year, the State Grange called for "uniting with the Agricultural Department of Cornell University in an earnest effort to secure legislative aid," adding: "We give it as our opinion that the proposed institution can be established more profitably to all concerned, in connection with Cornell University than elsewhere."⁹¹

When the legislature did not act, Caldwell took the initiative by organizing an agricultural experiment station at Cornell in February, 1879. In this he had the cooperation of Roberts and other members of the faculty of agriculture and the support of eight agricultural organizations. The faculty of agriculture, together with representatives of these eight groups, constituted the Board of Control of the Experiment Station. As far as the Board of Trustees was concerned, the station had no official existence, its only funds consisting of \$250 given by Jennie McGraw for printing its reports.* In his introduction to the first report, Caldwell, its director, noted, with what was probably a touch of irony, "All of the work of the station has therefore

*"President's Report to the Trustees," 1879, MS, White Papers. Miss McGraw's contribution was probably due to her father's interest in the agricultural work of the University. A trustee of the University, he offered in 1877, annual awards aggregating \$500 to students who best operated small plots as miniature farms. This award apparently was not offered after his death in that year (undated report to I. P. Roberts, folder dated Aug. 1-Nov. 13, 1877, Executive Committee Papers).

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been volunteer work, and has been limited, of course, by the amount of time not required for professional duties in the University."⁹²

The first report of the Cornell University Experiment Station appeared in May, 1880, with 133 pages of observations and reports of experiments by the faculty of agriculture, supplemented by the work of two recent graduate students, S. M. Babcock and W. H. Jordan. This publication was very favorably received by the agricultural press and especially by the widely circulated *Cultivator and Country Gentleman*. In a complimentary two-column review of the report, the journal encouraged readers to secure their copy by sending thirty cents to Professor Lazenby at Cornell.⁹³

Almost coincident with the publication of the Cornell Station's first report, a bill for the establishment of a state agricultural experiment station was finally placed before Governor Alonzo B. Cornell for signature. This bill provided for a board of control which was empowered to select the location of the station. The Governor was made a member, ex-officio; otherwise, its composition was remarkably similar to that of the Cornell University Station.* The Governor was in a difficult position; as eldest son of the founder and member of the University's Board of Trustees, signing the bill would leave him open to a charge of favoritism. This already difficult situation was complicated by a circular letter prepared by Acting President Russel in a moment when his zeal outran his judgment. Addressing the Board of Control of the State Station, Russel said: "The bill to establish an agricultural experiment station, which has recently passed both branches of the legislature, was drawn here, and its passage was urged by all proper efforts on our part. Our effort was to have the Station located here, and to make this a center of information on matters relating to agricultural progress."[†] Francis Finch, member

*The Board of Control of the State Station included a delegate each from the State Agricultural Society, the State Grange, the American Institute Farmers' Club, the Central New York Farmers' Club, the Western New York Horticultural Society, the Western New York Farmers' Club, and the Elmira Farmers' Club (ch. 592, *Laws of New York*, 1880). The Cornell station's Board of Control included these plus a representative of the Ithaca Farmers' Club.

[†]Russel, circular letter dated May 31, 1880, White Papers. Professor John L. Stone stated later that the bill was drafted by Lazenby (*Cornell Countryman*, Nov., 1910, pp. 40-42).

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of the Executive Committee of Cornell's Board of Trustees and counsel to the Governor, attacked Russel for his forthrightness: "To openly declare that this was a job got up by Cornell University and put through in our interest was to peril the measure in all directions . . . If the bill is signed I fear your circular will so irritate and sour the persons named in the bill that they will put the station elsewhere."⁹⁴

Governor Cornell resolved the dilemma by signing the bill, and the following month the trustees authorized Caldwell, Lazenby, and L. B. Arnold to attend a meeting at Albany of the Board of Control "in order to set forth Cornell University's claim to same." This was clearly not Caldwell's first trip to Albany on experiment station matters. In reporting to Russel, he said that his frequent trips to the state capital gave him the appearance of an office seeker. In any case, the state station would not be an unmitigated blessing, he said, for by meeting regularly the Board of Control could restrict the director's freedom of action.⁹⁵

The year 1880 ended hopefully as far as securing the station was concerned. Patrick Barry, of the famous Rochester nursery firm of Ellwanger and Barry, had been named chairman of the Board of Control and was considered not unfriendly to Cornell. Like the members of the Grange committee, he had earlier been critical of the University's handling of agricultural education; but through the attendance of Roberts and Lazenby at the meetings of the Western New York Horticultural Society, his attitude was gradually modified. As president of this society, which U. P. Hedrick has called "one of the leading organizations of its kind in the nation," Barry was in a powerful position to influence the development of agricultural education in the state.⁹⁶ Securing his interest in the University was an important accomplishment of the 1870's.

Barry became linked to the University in another way, less direct but no less important, when he joined in establishing the Society for the Promotion of Agricultural Science. The initiative for establishing the society came from E. L. Sturtevant, then the editor of *Scientific Farmer*, who called for the formation of

an association which should not seek a popular but a scientific membership; an association which should ignore the commonplace opinions and crudities

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of the popular society meetings, and should publish only those papers which could pass the ordeal of a competent and critical committee, as being contributions to knowledge and advancing to agriculture.

W. J. Beal of Michigan Agricultural College acted on this call and through correspondence prepared the way for a meeting at Rochester, New York, in September, 1879, when he, Barry, J. J. Thomas, Caldwell, L. B. Arnold, and Sturtevant formed the organization. Although never large, the society was soon national in scope. Its members, almost without exception, took an important part in the establishment and development of agricultural experiment stations throughout the United States.* Its proceedings and annual meetings provided improved media for communication in agricultural science, thus linking the period of personal communication with that of the experiment station bulletin.

Books also served to disseminate scientific knowledge. "A library of the best agricultural literature the world has ever seen has emanated from Cornell," declared A. C. True, director of the Department of Agriculture's Office of Experiment Stations, in 1914. Two books published during the first decade of the University's operation were among this number.⁹⁷ Caldwell's *Agricultural Qualitative and Quantitative Chemical Analysis*, consisting primarily of translations from Wolff, Fresenius, Krocker and others, was intended for students and fellow scientists. James Law wrote for a different audience. Recognizing the low value placed upon veterinary medicine in the United States, he attempted in *The Farmer's Veterinary Adviser* "educating the public up to a better appreciation of its value." By addressing his book directly to farmers, Law by-passed veterinarians, whom he regarded as "ignorant pretenders" not above treating such familiar but imaginary diseases as hollow horn, horn-ail, tail-ail, and black tooth.⁹⁸

Another contribution to agriculture from the Cornell faculty was of immediate economic significance. This was the whirling-spray nozzle, perfected by William S. Barnard, B.S. '71, while serving as assistant professor of entomology between 1879 and 1881. By breaking

**Proc. of the 1st, 2d and 3rd Meetings of the Society for the Promotion of Agricultural Science, 1880-1882* (Syracuse, N. Y.), pp. 9-10. The society had about forty members throughout the 1880's.

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up liquefied poisons forced through it into a fine spray, this small device made possible more efficient control of harmful insects and fungi. Although by modern standards spraying equipment remained primitive after the perfection of this nozzle, for only low pressures could be developed by the hand pumps then in use, the nozzle at least helped make spraying an economically feasible process and ultimately led to further research toward improving other parts of spraying machinery.⁹⁹

The nature of agricultural education at Cornell during the first twelve years was largely determined by the size of the institution, its recent establishment, and its uncertain financial stability. These conditions were healthy to the extent that they contributed to the high morale faculty and students achieved through working together to create a new institution under difficult circumstances.* In other ways they were debilitating, for they placed limits on the expansion of buildings and faculty at a time when such improvement was necessary to maintain the feeling of progress. Moreover, they made day-to-day operations difficult, since the absence of both money and tradition meant that decisions largely based upon expediency would be readily altered as circumstances changed.

One consequence of the size of the University was relationships between students and faculty and of both with the townspeople which a modern dean of students might consider ideal. The student Agricultural Society established in 1871-1872 was small enough to give John Stanton Gould's talks to its membership the quality of personal conversation.¹⁰⁰ Students attending Professor Prentiss' botany lectures in 1875 had a number of local farmers for classmates. The agricultural students participated with the faculty in the affairs of the Ithaca Farmers' Club.¹⁰¹ During the two afternoons a week that students spent with Professor Roberts visiting other farms in the neighborhood they had an opportunity to learn the problems of farm management, for their contacts with neighboring farmers were of sufficient intimacy and duration to evaluate the resources of the farmer in relation to the

*High morale due to the conquest of adversity is reflected in numerous contemporary diaries and letters in the University Archives. For example, see John Y. Davis Letters, Oct.-Dec., 1868; James Shearer Letters, Nov., 1874-April, 1875; W. P. Sturgis Diary, 1875.

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possibilities of his farm operation.¹⁰²

These working relationships between students, faculty, and local farmers created the psychological climate necessary for holding the first farmers' institute in New York State. Professor Roberts had been an institute lecturer in Iowa earlier in his career.* In 1877, while president of the Ithaca Farmers' Club, he introduced New York farmers to this form of agricultural education. The institute, held on the twenty-eighth of February, was described in detail by the *Cultivator and Country Gentleman*.¹⁰³ The Ithaca Farmers' Club acted as host, and six members of the Cornell faculty participated, discussing such practical concerns as weeds, insects, animal parasites, the cultivation of corn, the use of fertilizers, and the value and construction of the trench silo. The success of this institute indicated, perhaps better than any other measure, the acceptance of Cornell's agricultural education by Tompkins County farmers.

Relations between the administration and faculty were also informal. Both President White and Professor Russel taught classes and had numerous other contacts with the faculty, for the small adult population on East Hill was drawn together in those days. The relationship between the President and Roberts was closer than it might have been had White not needed expert care for his horses and cow during the time he was away from the University. By 1879 Roberts felt sufficiently familiar with White to advise him on general university matters.¹⁰⁴ Of course, informal relationships and frequent contacts with colleagues did not necessarily assure cooperation. Roberts would have been greatly aided had Professor Prentiss emphasized agricultural relationships in his botany instruction more often and acquiesced in the clarification of Lazenby's position as head of the Department of Horticulture. Horticulture was officially a sub-department of botany, yet Lazenby's work was most closely connected with agriculture. When Roberts requested that horticulture be transferred to agriculture, the trustees replied by "examining the expediency of abolishing the Department of Horticulture."¹⁰⁵

*Roberts, *Autobiog.*, pp. 165-167. The institutes were meetings of farmers who came together to hear lectures on agricultural subjects. Their development is described in A. C. True, *A History of Agricultural Extension Work in the United States, 1785-1923* (Washington, 1928), pp. 5-14.

THE BEGINNING, 1868-1880

What benefits accrued from the small size of the University were constantly jeopardized by the shortage of funds. Always serious, this shortage became a subject of open complaint after 1876. Comstock noted in his report to the President that the only microscope in his department available for student use had been purchased from his own salary.¹⁰⁶ Roberts was so fully occupied with teaching, supervising the farm help, and conducting experiments that he required his daughter's help in maintaining the farm and experiment station records. In 1878 the Executive Committee of the Board of Trustees refused his request for a foreman, even though the farm had produced a profit.¹⁰⁷ In that year, also, Professor Law requested some needed equipment or the removal from the *University Register* of the provision for a veterinary degree. The following year Roberts prefaced a statement concerning a Holstein heifer with, "If I thought it would be any use I would ask for . . ." In 1880, Law repeated his requests of 1878, while Caldwell simply went ahead and paid out of his own pocket the assistant who did the experiment station analyses.¹⁰⁸

These financial hardships, combined with the trustees' lack of interest in the Department of Agriculture, might seem to support the charge that the University was neglecting agricultural education. However, an examination of the financial records of the University indicates that, based on the number of students enrolled, agriculture did at least as well as the other departments of the University and in some years it did better.¹⁰⁹ It may be said, of course, that even in the 1870's the number of students was not an adequate measure of the needs of the Department of Agriculture, for experiments already under way created expenses beyond those required for teaching. A judgment on this score must consider the funds available to the University. From this perspective, it seems unrealistic to have expected the University authorities to aid the experimental work in agriculture when the total appropriations for all teaching departments was in several years less than \$15,000.*

Financial difficulties became more pressing with the rapid fall in student numbers after 1878. Student enrollment in agriculture com-

*Between 1873-76 and 1878-80, total appropriations to all teaching departments (excluding salaries) ranged between \$12,000 and \$18,000 (Treasurer's Rpt., 1873 to 1880, MS).

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pared with the total enrollment during the years 1878-1880 was as follows:

<i>Year</i>	<i>No. in Agriculture</i>	<i>No. in University</i>
1878-79	41	505
1879-80	35	463
1880-81	26	399

The resulting decrease in tuition income led the trustees, then committed to a balanced budget, to tighten expenditures further, thereby making the University even less attractive to prospective students. In 1879-80, tuition income fell so much that the trustees faced a deficit of nearly \$18,000.¹¹⁰ In the spring of 1880 the University advertised for students in nine newspapers, the Department of Agriculture having its own advertisements in addition.¹¹¹

Under these circumstances the construction of a new barn in 1879 was all the more remarkable. Although erected for less than \$6,000, the barn was a marvel in its time. Built into the side of a hill on the present site of Comstock Hall, it stood one hundred feet high, with a permanently installed thresher and system of conveyors to move the straw and grain.¹¹² Roberts was excited about the glories of his new barn, calling it "an honor to the University." Fully two thousand people, he said, came to see it during the summer of 1879.¹¹³ The decision to build this barn in the midst of a financial crisis was probably prompted by the desire to secure the support of New York farm organizations. The condemnation of the McCandless barn by the Grange committee in 1877 clearly identified an area within which the University could demonstrate its concern for agricultural education.¹¹⁴

In the years immediately preceding the construction of the barn, Professor Roberts began the development of the Holstein herd which later acquired a national reputation under the management of H. H. Wing. At that time there were only a few Holsteins in the United States; as a breed it was generally regarded as far inferior to the Shorthorn or Jersey. Much to his surprise, Roberts' purchase of three Holstein cattle brought a bitter attack from Governor Alonzo Cornell, who evidently considered Roberts' action a reflection on his father's acquisition of purebred Shorthorn cattle. Thus was his sound judg-

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ment rewarded: "My heresy in buying Holsteins nearly cost me my job," Roberts recalled later, "and it was a long time before the prejudice against them died out."¹¹⁵

It should not be assumed that the kind of difficulties Roberts faced were limited to Cornell University; similar problems occurred wherever a college of agriculture was part of a university. The status of agricultural work was generally lower than that of other courses, which in turn was related to the lower student enrollment in agricultural courses. At the University of Mississippi the combined enrollment in agriculture and the mechanic arts was five in 1874 and three in 1875, and it is presumed that these three were in mechanic arts. E. W. Hilgard, one of the outstanding agricultural scientists and educators this country has produced, was in charge of the agricultural work there. In 1875 he went to the University of California as professor of agriculture, where he had no students for two years. The University of Minnesota had no more than three students enrolled in agriculture at any time prior to 1880, and few of these lasted all year. Yale College had more professors of agriculture than students. The University of Wisconsin had only one graduate in agriculture by 1882.¹¹⁶

By comparison, Roberts was remarkably successful in attracting students, a situation almost certainly due to his ability to provide sound information to farmers about matters they considered important in language they understood. It is noteworthy that Roberts undertook to extend agricultural knowledge to New York farmers largely on his own responsibility. Unlike California and Kansas, where by 1870 the boards of regents required the professor of agriculture to extend the advantages of his college to the people of the state, Cornell's governing board, thinking of agricultural education in terms of resident instruction, viewed extension with considerable skepticism.¹¹⁷

The Search for Identity, 1881-1890

DURING the 1870's the method and content of agricultural education at Cornell were only slightly influenced by conditions associated with the production and marketing of agricultural commodities in other states. This isolation was a result of the inevitable gap between agricultural change and agricultural educators' adjustment to this change. In the 1870's, events were already occurring in areas seemingly remote from New York agriculture which would, in the next decade, affect the activities of many New York farmers and, in turn, the teaching of agriculture at Cornell.

Measured by the number of farms, New York agriculture reached its zenith by 1880. For forty years New York farmers had been successfully competing with middle western farmers, whose land was often more fertile and easier to cultivate, but who faced higher transportation costs in marketing their produce in the East or in Europe. Just as middle western competition was becoming serious in the 1850's, New York farmers were reprieved from its consequences by the increased wartime demand for farm products in the United States and, following the Civil War, by a series of poor harvests in Europe. This reprieve ended in 1880 with the return of good harvests abroad.¹ At the same time that the demand for farm products declined, New York farmers faced increasing competition from the Middle West, following Gustavus Swift's utilization of refrigerator cars to ship fresh meats eastward from Chicago.² Now meats, in addition to wheat and feed grains, were farm products on which many middle western farmers had a competitive advantage. With other agricultural areas of the country competing in eastern markets, New York farmers were forced into a process of adjustment that has continued to the present. Cornell aided farmers in this process of

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adjustment; Roberts and other members of the faculty of agriculture identified themselves with the interests of farmers, and in the long run the University's policy of attempting to gain the support of farm groups required alignment of its agricultural education with the expressed needs of farmers.

In the summer of 1880 the trustees set out to recapture the feeling of progress which had characterized the University at its beginning by demanding that White, then serving as American Minister to Germany, either resign as president of the University or return to the personal direction of its affairs. At the same time Acting President Russel, whose administration was associated with failure in the minds of the trustees, was dismissed from the University.* In this shake-up the Department of Horticulture was abolished—whereupon Professor Lazenby became head of the Department of Horticulture at Ohio State University. The return of President White marked no significant change in policy toward the Department of Agriculture, but his prestige prevented the trustees from ignoring his recommendations for the department, as they had those of Russel.

The Cornell University Experiment Station was the principal concern of the faculty of agriculture during the 1880's, and on his return White supported its development. The six months preceding his return, however, were crucial for the Experiment Station, and in this period administrative power rested in the hands of the chairman of the Board of Trustees, Henry W. Sage.† It was he who decided not to press Cornell's claim for the state experiment station when it was evident that failure to do so would lead to its location elsewhere.

At the State Grange meeting in January, 1881, a resolution was introduced by a member of the investigating committee of 1877 who had praised Cornell at the State Grange in 1879 and who, presumably,

*The dismissal of William C. Russel and the return of White to active administration of the University is analyzed by Anita Shafer Goodstein in *Biography of a Businessman: Henry W. Sage, 1814-1897* (Ithaca, 1962), pp. 230-240, and by Morris Bishop in *A History of Cornell* (Ithaca, 1962), pp. 215-223.

†Russel was dismissed in January, 1881, effective that June, but his administrative authority was nominal after January (Sage to White, Jan. 5, 1881, White Papers).

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was still a friend of the University. The basis for his resolution, which called for locating the state station "at least 100 miles distant from Cornell University," was that public institutions established for aiding scientific agriculture should be located in different sections of the state "for the purpose of distributing as widely as possible the benefits arising therefrom."* There was a sound scientific basis for this position, since information derived from agricultural experiments was limited in its applicability to environments similar to those in which the experiment was conducted. The combination of soil and climatic factors at Cornell was not typical of the better agricultural areas of the state; consequently, experiments conducted there had to be repeated under a variety of soil-climate combinations before their significance for New York agriculture could be determined. The environment at Ithaca was also less congenial than that in many other parts of the state for experiments in pomology and nursery operation, both of which were becoming increasingly important in New York agriculture.

On February 22, 1881, P. B. Crandall, a prominent Tompkins County farmer and member of the Ithaca Farmers' Club, wrote to Sage urging him to make a "definite proposition" to the Board of Control of the state experiment station so that it would be located in Ithaca. Nearly two weeks later Crandall wrote Patrick Barry, chairman of the Committee on Location, urging the selection of Cornell. Barry replied immediately: "I am not aware that the Board of Control has received any proposition from the Trustees of Cornell University. I expected they would and I have regretted they did not. For my own part I would be glad to have the station connected with the University."⁸ Before Barry's reply was received, Sage had made a proposition to the Board of Control, and at the same time Crandall sent another letter to Barry urging the Ithaca location.

Sage's letter was perfunctory. There was no mention of what Cornell had done or hoped to accomplish with its agricultural experiment station. Rather, in the briefest way, he offered Cornell's facilities "for one at least of the stations you propose to establish," provided

*It is interesting that in the Grange resolution Cornell was regarded as a public institution. The resolution was referred to a committee where it died (*Proc. of the N. Y. State Grange*, 1881, p. 86).

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that this be accomplished "without interfering with the regular duties of our Professors."⁴ Sage was a prolific writer and successful businessman who knew how to get what he wanted, so no other conclusion seems possible than that he did not want the state agricultural experiment station at Cornell. This conclusion is reinforced by Sage's comment to Crandall that the University was not interested in assuming responsibility for the success of the station or for the administration of its finances.* This decision was certainly colored by his lack of interest in the Department of Agriculture. It was not until around 1890 that Roberts first saw Sage on the agricultural part of the campus, and then he turned and drove off without saying a word. In his *Autobiography*, Roberts also recalls the trustees' lack of sympathy and cooperation, stating at one point that he "felt the College of Agriculture existed only by sufferance."⁵

By June of 1881, Roberts felt it was "settled almost beyond a doubt" that the state experiment station would be located at Geneva.† As a consequence, unless the university trustees provided direct support, the Cornell Experiment Station would be overshadowed by a state station with an annual appropriation of \$20,000. Continued dependence on uncertain farm income was clearly impossible, since the operation of an organized experiment station required known assets. With the support of President White, Caldwell and Roberts pressed for an appropriation, which they secured in October, 1881. In granting \$1,000, the trustees officially conceded the existence of the Cornell University Experiment Station.⁶

The second report of the Cornell Station was prepared almost entirely by Professors Roberts, Caldwell, and Comstock. It was favorably received on its appearance in June, 1883, by the *Cultivator and Country Gentleman*, which selected Roberts' research and

*Crandall reports this conversation with Sage in his letter to Barry of March 9, 1881, saying that it occurred a few days previously (Executive Committee Papers).

†Roberts in "President's Report to the Trustees," 1881, pp. 154-155 (MS, White Papers). The Geneva location was selected by February, 1881, but because of faulty legislation it did not become the property of the state until February, 1882 (*1st Ann. Rpt. of the Board of Control of the N. Y. State Exp. Sta. for the Year 1882*, p. 3).

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writing for special praise. The other articles, this periodical reported, were somewhat too technical for general interest. Although written for a limited audience of fellow scientists, Caldwell's report on how changes in the composition of rations affected cattle and Comstock's report on scale insects were equally significant additions to agricultural knowledge.

Roberts was enthusiastic about the experimental work of the year, which he described at the beginning of his report to the President. He urged a slightly increased expenditure, by which "a station might be established which would rank second to none." Caldwell was sufficiently encouraged to recommend an appropriation for the appointment of an assistant director to supervise the experiments.⁷

Some of this enthusiasm may well have been calculated to overcome trustee opposition to continuing the experimental work. In July, 1883, Caldwell urged that the trustees make an appropriation so he could employ a chemist beginning September 1 to do the experiment station analyses. However, the question of continuing the station was tabled by the trustees during August and September.⁸ While the decision was finally made to continue the station, the trustees chose to strangle its work by degrees, through continuous reduction of the annual appropriation. The Cornell University Experiment Station appropriations from 1881 to 1886 were as follows:⁹

<i>Year</i>	<i>Appropriation</i>
1881-82	\$1,000
1882-83	1,145
1883-84	750
1884-85	250
1885-86	150
1886-87	—

The refusal to make appropriations for the Experiment Station after 1885 was consistent with the trustees' attitude toward the Department of Agriculture; what is surprising is the support the station received over the five-year period. The decline in the number of students after 1880 probably prompted the original appropriation; it seems most unlikely after Sage's coolness toward locating the state station at Ithaca that any desire to aid agricultural science was intended.

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The connection between the development of agricultural experiment stations and increasing enrollment of agricultural students was tenuous, but unquestionably was believed to exist. Crandall drew on this presumed relationship in his letter to Barry, saying that experimental work would elevate the pursuit of farming and thereby interest the sons of farmers in agricultural education.¹⁰ A more complex connection was made in the argument that information produced by agricultural experiment stations would lead to a more profitable agriculture, and that once this was perceived by students they would turn toward agricultural education in increasing numbers. Although the experience of 1881-1885 might suggest the contrary, Caldwell stated in 1886 that "it takes no argument to prove" that resumption of the Experiment Station would bring us students and friends among the farmers of the state.¹¹ Whatever the validity of the argument in the long run, the Cornell University Experiment Station brought no immediate increase in agricultural students. Student enrollment in the years 1880-1884 was as follows:¹²

<i>Year</i>	<i>No. in Agriculture</i>	<i>No. in University</i>
1880-81	26	399
1881-82	16	384
1882-83	15	406
1883-84	13	461
1884-85	20	575

Given their preoccupation with enrollment, which was increasing elsewhere in the University, the trustees could no longer justify support of the Experiment Station.

Until the fall of 1885 the agricultural curriculum remained much the same as during the 1870's with Professor Roberts' instruction attached to the end of three years of language, science, and mathematics. As before, most of the students enrolled in agriculture attended only to take the work most directly related to farming.¹³ By 1885, when the University had 1,028 graduates, only thirty had received the degree of Bachelor of Agriculture.¹⁴ Classes continued to be small, with considerable flexibility possible in their arrangement. In 1882 Roberts combined the junior and senior classes, thereby freeing himself from classroom duties in the winter of 1883 in order

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to make an on-the-spot study of southern agriculture. In the spring of 1885 he took nine students on a five-day trip to the Ontario Agricultural College at Guelph, stopping at noteworthy farms along the way.¹⁵

Roberts continued to spend two afternoons each week with students on the university or neighboring farms, observing and discussing farm operations. This close association with a master farmer who could bridge agricultural science and practice in the outdoor classroom was probably ideal for the students, but was not what Roberts desired. During the 1880's he was increasingly concerned about the absence of technical farming skills on the part of those who graduated in agriculture. After 1875 the *Cornell University Register* contained a statement that additional summer work might be required of students who did not become proficient in field work during the two afternoons a week. However, this provision was more an indication of concern than a requirement for graduation, for Roberts was far too kindly a man to stop a student from graduating because he could not handle a plow.* Roberts' desire to strike a balance between the manual labor system, which he considered "a farce" in teaching the "more complex operations of the farm," and the almost complete lack of farm practice that existed at Cornell was frustrated by a shortage of funds. His desire to use the university farm as a place where the students could practice farming techniques conflicted with the operation of the Experiment Station, where, when expenses exceeded trustee appropriations, the deficit had to come from farm profits.¹⁶ These profits, in turn, were dependent on the work of skilled farm laborers. If their work was compromised by the mistakes of novices, the Experiment Station was certain to suffer.

As had been the case in the previous decade, the farm continued to be the center of Roberts' interests, with much of his experimental work developing out of its operation. One of the limitations on increasing the efficiency of the farm was the lack of convenient living accommodations for farm help. The married men had to come a long distance by buggy or sleigh; the single men slept in the barn but

*In his *Autobiography*, p. 232, Roberts says, "I was compelled to recommend for graduation for many years students who had no acquaintance whatever with farm practice."

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had difficulty in getting board. In recommending the construction of cottages for the farm laborers, Roberts said that they were expected to be at the barns summer and winter at 5:30 A. M., and, "although they work only until 6 P. M. in the field, it is usually 7 P. M. before they get all of the barn work completed."¹⁷ Accommodations for the dairyman were especially important since a herd of dairy cows could not be managed from a distance. Not content to await the time when the trustees would appropriate the necessary money, Roberts advanced the funds to construct a house for the dairyman, the trustees agreeing to repay the loan within three years. The following year, Roberts secured a \$200 appropriation for repairing a small tenant house he planned to move near the farm buildings.¹⁸

George W. Tailby, who had come to Cornell as farm foreman in 1878, moved into the dairyman's house. Much of Roberts' success with the university farm was due to his relationship with Tailby. He admired his foreman and was always careful to cast instructions into the form of asking advice. "George," he would say, "don't you think we had better plow that field today?" Tailby, in turn, was dedicated to his job and pushed the work along as if it were his own farm. James Drew, a student in agriculture who lived at his house, recalled Tailby's working to get in the hay on a Fourth of July when the farm hands were away. In order to help out, Drew took the team, "George" and "Garfield," and cut clover the entire day, an incident which illustrates something of Tailby's conscientiousness and that of his boarder as well.¹⁹

Through plowing green crops under and careful crop rotation, Roberts gradually increased the productivity of the farm. In 1883 he installed tile drainage, which, unlike the former practices, involved a large initial outlay, an expense he justified to President White with a characteristic aphorism: "A farm is like a bank; neither honors drafts without receiving previous deposits."²⁰ It was through his efforts to increase farm productivity that Roberts noticed the economic value of properly preserved manure. He later determined this value under experimental conditions and made it the subject of an experiment station report.²¹ In 1874 the university farm yielded less than eight bushels of wheat per acre; in 1882 the average yield was thirty bushels, an increase which Roberts attributed to the use of farm

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manure. The steps traversed between the low yield of wheat in 1874 and Roberts' conclusion, in 1885, that farm manure could be worth \$3.61 a ton, illustrate the combination of experimental scientist-practical farmer that was Roberts at his best—an example for wise farm managers everywhere.

In 1874 manure in sufficient quantity was available only by hauling it from the stables in Ithaca. The expense of transportation and the poor quality of the product—manure was then usually thrown outside the stable door to be leached by the rain and “burned” through chemical decomposition—made this source of plant nutrients economically prohibitive. Roberts then tried commercial fertilizers, but found them equally unsatisfactory. Costs were high and results uncertain, for although sulphate, phosphate, potassium, and nitrogen were being widely advocated, little was known about the nutritional requirements of different crops and the abilities of different soils to assimilate fertilizers. After 1879 Roberts utilized manure from the pen stable of the new barn. This was a covered yard where the horses and cows could exercise, clean bedding being added each day. Control of the moisture content and the amount of bedding added produced manure of high quality, as demonstrated by chemical analysis and the results of field production.²² Roberts passed these observations on to farmers in the *Cultivator and Country Gentleman*, urging them to husband a resource they could only partially replace by the purchase of expensive commercial fertilizer.*

Other members of the faculty also had information of practical value for farmers. Through observations and experiments Caldwell had arrived at improved methods for producing dairy products; Law knew how to prevent the spread of bovine tuberculosis; and Comstock could recommend controls for harmful insects. In spite of uncertain support, the Cornell University Experiment Station had produced a body of information of potential economic value. However, this potential could not be realized until the work of the station was placed before farmers in a context where it could dominate conflicting information. In this respect the agricultural press was a poor tool for

*Feb. 26, 1885, p. 171. For a critical analysis of Roberts' experiments on the value of manure by an advocate of commercial fertilizer see the issue of April 9, 1885, p. 303.

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communicating scientific information, for journalistic skill and a reputation for authority were required to make one article more persuasive than another. Talks before agricultural organizations also had built-in limitations, for in the 1880's these organizations included members with a wide range of interests. Talks dealing with specialized topics were submerged in the diversities of the program and the pressures of time. A new form of communication was needed to connect Cornell's faculty of agriculture with the farmers of the state, and in establishing this link, Charles Kendall Adams played a vital role.

In the summer of 1885, this former professor of history at the University of Michigan, who succeeded White as president of Cornell University, actively advanced the interests of the Department of Agriculture. Where White had stood before farm organizations as an apologist defending Cornell's contribution to New York State agriculture, Adams stood among farmers asking what Cornell could do to aid them. Where White's relationship to the Department of Agriculture appeared to be one of making the best of a situation forced upon him by the requirements of the Morrill Act and his association with Ezra Cornell, Adams was directly involved in making the University the center of agricultural education in New York for both farmers and the sons of farmers.

The movement of events favored Adams, for by 1885 New York farmers were more open to conviction that Cornell's agricultural education had relevance to their own farm operations. Through the leadership of the agricultural press and farm organizations like the Grange, farmers were learning that experiment stations could provide more useful information than was available from other sources. The development of this changing expectation was facilitated by the increasing respect for science that was sweeping American society; indeed, changing the orientation of the largest occupational group in that society toward new sources of information depended upon this fundamental social change. Any evaluation of Andrew D. White's effect on agricultural education must weigh his contribution to promoting an understanding of the value of science, through books, speeches, and the Cornell University curriculum. We can only question whether, prior to the development of a widespread respect for science, greater financial support for the Department of Agriculture

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would have resulted in greater farmer interest.

President Adams and Professor Roberts promoted the farmers' institute as a communication link between the University and the farmers of the state, thus utilizing on a broader basis the technique which had worked so well in Tompkins County in 1877. The desirability of holding an institute at Cornell for the farmers of the state was suggested to Roberts at the convention of the Western New York Horticultural Association in 1885. In reporting the idea, Roberts said that about forty of the most prominent agriculturists could be induced to attend. "I believe the time is ripe for this move and that it would do both agriculture and the University great good. I have already taken some steps in this matter."²³ President Adams described the basis for his decision to hold this institute in his annual report for 1892, which, although written well after the event, was consistent with other evidence:

After repeated conferences with the professors most directly interested, I decided to invite to the University a large number of the leading agriculturists of the State for the two-fold purpose of holding a farmers' institute and of making the resources of the University for the improvement of agriculture as widely known as possible.²⁴

The institute was held in February, 1886, and lasted three days. The invitations, numbering about one hundred, were prepared by the careful hand of Professor Roberts' neighbor, Mrs. Anna B. Comstock.²⁵ In order to provide headquarters for the institute, the University Faculty was temporarily turned out of its room in Morrill Hall. Classrooms were used to accommodate the institute lecturers. About one hundred people registered, and it was estimated that over two hundred were present.²⁶ On the evening of the first day, President Adams addressed to the group "A Plea for Scientific Agriculture," in which he stated that experiment stations could be the means for transforming American agriculture. During the institute Caldwell, Comstock, Law, and Roberts described their work at Cornell. Over half the speakers, however, were not faculty members—many were practicing farmers.²⁷ Years later one of the participants recalled Roberts' fear that the institute would not end successfully:

Professor I. P. Roberts was much worried for fear that someone would

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“make a break.” Never before had the leading interests been brought together . . . Nothing occurred to break the harmony of this conference and it was *then* considered a great success, and Professor Roberts was congratulated on it, and its results, at its close.²⁸

Before separating, those attending the institute resolved that Cornell be asked to hold similar meetings each year.²⁹

J. S. Woodward, corresponding secretary of the New York State Agricultural Society, was one of the most active participants in the Cornell institute and, following the success of this meeting, he moved to organize similar institutes under the sponsorship of the society. In February, 1887, an institute was held at Cornell in conjunction with the annual meeting of the society. This three-day gathering was addressed by President Atherton of the Pennsylvania State College, President Willets of Michigan Agricultural College, and H. E. Alvord, then at Massachusetts Agricultural College. The *Cornell Era* reported that farmers were “made to feel at home” at the University and that students were impressed by the “ease with which President Adams adapted himself to his surroundings.”³⁰ During that winter of 1886-1887, other institutes were held at Lockport, Oswego, Batavia, and Schenectady, with at least one Cornell professor taking a prominent part in each institute. The success of these meetings prompted the legislature to appropriate \$6,000 to the New York State Agricultural Society for its institute work during 1887-1888.³¹ The great popularity of this form of agricultural education, along with public funds to pay travel expenses, soon gave the Cornell faculty access to nearly every agricultural community in the state.

While encouraging the faculty to go to the farmers, Adams supported a change in the University's admissions policy which facilitated the entry of farmers' sons as special students. Prior to 1886 special agricultural students were not admitted without entrance examinations unless they had reached the age of twenty-one. The recommendation of the faculty of agriculture that this age limit be reduced to eighteen was rejected by the University Faculty in 1885, but was approved in April, 1886, after strong support from President Adams. Thereafter, applicants were screened in an informal interview with Professor Roberts; and selected special students were admitted to the

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agricultural courses, where they were not required to take the regular course examinations.³² This admissions policy provided the flexibility needed to meet the professional needs of farm boys who were highly motivated but lacked the academic preparation to pass entrance examinations. The success of this policy depended on Professor Roberts' ability to determine whether candidates possessed sufficient motivation and facility with English to make attendance at Cornell useful to them. After a year's trial, President Adams declared that the special agricultural students were "earnest, faithful, and efficient."³³ Professor Caldwell, who was an advocate of high standards, said the special students did better than he had expected; there was no reason, he thought, for regretting the new admissions policy.³⁴

The four-year course was also adapted to the needs of farmers. President Adams felt that this curriculum, unchanged in its fundamentals since the University opened, was "likely to create the impression that it is intended quite as much for those who would teach the science of agriculture as for the education of farmers."³⁵ In the new curriculum, introduced in 1886, the foreign language requirement was limited to the freshman year; otherwise the first two years consisted almost entirely of science and mathematics. The major change was in the last two years, which were made entirely elective with the exception of a junior theme and a twelve-hour requirement in courses related to agriculture or horticulture.³⁶ Students could continue to concentrate on the sciences during their last two years or move toward farm management through study with Professor Roberts.

The new curriculum and admissions policy combined with farmers' increasing awareness of the University and growing respect for its agricultural education led to an increase in students after 1885,* as shown in the following figures of student enrollment for 1885-1890:³⁷

*The Master of the State Grange had promoted attendance at Cornell even before these changes were made. "Possibly I have had some little influence already in adding a few names to the agricultural class," W. A. Armstrong wrote to White, Dec. 23, 1884 (White Papers).

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<i>Year</i>	<i>No. of Regular Ag. Students</i>	<i>No. of Special Ag. Students</i>
1885-86	23	—
1886-87	33	5
1887-88	33	12
1888-89	37	21
1889-90	28	21
1890-91	32	20

This was not an unmitigated blessing, for as the number of special agricultural students increased it became more difficult to give them the necessary individual attention. By 1889 Caldwell considered the difficulty of teaching regular and special students in the same class a substantial handicap to everyone involved. He recommended that special students be required to stay two years, the first being devoted to basic science and the second to the agricultural applications of science.³⁸

The increased enrollment was in decided contrast to other colleges of agriculture in universities. The University of Wisconsin had two students in agriculture in 1885 and none during the next two years. The University of Minnesota had one student in agriculture in 1884 and none the following year. In 1887 seven students were enrolled in agriculture in the University of Missouri. Even Pennsylvania State College, which had been concentrating on agricultural education, had no students in agriculture in 1882, thereby enabling Caldwell's former graduate student, Whitman H. Jordan, now professor of agriculture, to devote full time to experimentation.³⁹

Cornell's agricultural students came from many states and countries. Although most were from New York during the decade 1881-1890, every adjacent state was represented, as was Ohio, Indiana, Illinois, Michigan, Wisconsin, Maryland, Virginia, Kentucky, and Louisiana. Eleven students came from foreign countries; four from Japan, three from Brazil, and one each from England, France, Turkey, and Colombia. While the effectiveness of Roberts and his colleagues in extending the work in agriculture to people outside Cornell was unquestionably related to the increasing enrollment from New York and adjacent states, it does not explain the substantial enrollment

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from foreign countries. In all probability these students were attracted by the reputation of Cornell University rather than by knowledge of its contribution to agricultural education.⁴⁰

The year 1886 was one of transition for the Cornell University Experiment Station. Adams termed the trustees' refusal to provide support "a mistake," especially at a time when the national movement for further aid to agricultural colleges seemed about to produce results in Congress.⁴¹ Since this movement was initiated at the Washington convention in 1872, it had proceeded fitfully to a second Washington conference in 1882. At that meeting Caldwell expressed the combination of hope and frustration that enveloped the advocates of the agricultural experiment stations. The lack of financial support, said Caldwell, reflected the lack of public interest and understanding of experiment station work, but if the public was not willing to be educated, "the idea of progress in agriculture is nothing but a dream." Such a public must exist, he concluded, or experiment stations would not have spread so far from their birthplace in Germany and England. The convention dealt with a broad range of agricultural problems; Professor Law read a paper on the lung plague and Professor Roberts one on the perpetuation of milk qualities in dairy cattle. A committee on cooperative experiments pointed the way to the more highly organized Washington conference of 1883 in recommending that the U. S. Department of Agriculture become a medium of communication for those interested in agricultural experimentation and that Congress be asked to contribute funds for this development.⁴²

By the time this convention met, a bill going well beyond the recommendations of the previous Washington conference had already been introduced in Congress. Drafted by President Seaman A. Knapp of the Iowa Agricultural College, it provided for the establishment of "national experiment stations" in connection with state agricultural colleges. This bill was perfected during the 1883 convention and presented before Congress in somewhat modified form each year until 1887. The provision for a \$15,000 annual appropriation to each state was maintained throughout, but the provisions containing even a minimal degree of federal control were removed at the insistence of the states before the act was finally passed in 1887.⁴³ On its third appearance in Congress in 1884, the bill was viewed

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with indifference by the House Committee on Agriculture. According to Professor G. H. Cook of Rutgers, who appeared before the committee, "they really did not seem to think it was of any consequence whatever."⁴⁴ Thereafter, the commissioner of agriculture, Norman Colman, worked effectively with a committee appointed in 1885 at a convention of delegates from agriculture colleges and experiment stations to secure the cooperation of Representative William Hatch of Missouri, who finally directed the act through Congress. In 1886 President Adams appeared before the same House Committee on Agriculture to emphasize the value of experiment stations to farmers, using as his principal evidence Roberts' experiments with farmyard manure.⁴⁵ Otherwise it does not appear that Cornell's representatives took a direct part in obtaining passage of the experiment station legislation.* Their contribution lay in advancing research related to agriculture, in facilitating the exchange of scientific information, and in avoiding the pitfalls of the model farm and the glorification of manual labor.

The passage of the Hatch Act placed the United States commissioner of agriculture in a difficult relationship to the state agricultural colleges. At the request of the representatives of these colleges, he was made responsible by a provision in the act for securing "as far as practicable, uniformity of methods and results in the work of said stations," but by the insistence of these same representatives was given no authority over how the state experiment stations used their \$15,000 annual subsidy.† The necessity for a continuing process of accommodation between the commissioner of agriculture and the agricultural colleges and experiment stations had been anticipated. For this purpose an organization to replace their previously unstructured relationship was established during October, 1887, when delegates from the state institutions, meeting at the Department of Agriculture in Washington, formed the Association of American

*Roberts was not listed as present at the Washington convention of 1885 on the day the experiment station bill was being discussed (*Proc. of a Convention of Delegates*, 1885, pp. 42, 118).

†Uniformity of results referred to uniformity in the method of reporting results. The full text of the Hatch Act is printed in Bailey, *Cyclopedia of American Agriculture*, IV, 424-425.

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Agricultural Colleges and Experiment Stations. Under the association's constitution the Department of Agriculture was admitted to membership. An executive committee was made responsible for "looking after legislation affecting the stations," its expenses to be met by an annual contribution of \$30 from each station receiving the full Hatch Act fund.⁴⁶

Henry E. Alvord was named chairman and President Adams a member of the first executive committee.⁴⁷ Alvord was an excellent man for the position. Aggressive and able, he had taken a major part in organizing the Washington conventions of 1882, 1883, and 1885, and in preparing the transition to permanent organization.* Anxious to strengthen the association, in 1889 he asked Roberts, as a member of the executive committee, to write President-elect Benjamin Harrison and get others to do so on behalf of measures desired by the association. He also urged all members to transmit their business with the national government through the association.⁴⁸

Enactment of the Hatch Act did not mean that Cornell University immediately received \$15,000 annually for its Experiment Station, for section eight of the act gave the state legislatures broad authority in determining the distribution of the fund. Under this provision, the New York State legislature could give all or part of the fund to the New York State Agricultural Experiment Station at Geneva. Actually, well over \$15,000 was involved, since the stations receiving the fund were assigned the franking privilege for official publications. Within a week after President Cleveland signed the Hatch Act, the Cornell trustees approved a draft of a memorial to the state legislature setting forth the University's claim to the fund.⁴⁹ The legislature, however, refused to make any decision on the allocation of the fund, simply giving, by concurrent resolution, its consent to the Hatch Act as required by section nine. By this device the legislature passed the issue to the United States Treasury Department, where Alvord helped present the Cornell claim. On March 12, 1888, Alvord reported that the federal comptroller had practically decided to pay the fund to

*Alvord had been general manager of Houghton Farm, a private experimental farm located near Newburgh, N. Y., which was supported by Lawson Valentine (*Houghton Farm Experimental Department*, ser. I-III, 1882-1883).

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Cornell.⁵⁰ Meanwhile, the New York State Agricultural Society had been supporting Cornell's claim in Albany. "We are *not going to be beaten*," J. S. Woodward wrote Adams. In describing his lobbying efforts, he suggested that if Adams had any Democratic friends it would be well for them to see the Governor.⁵¹

Anticipating the Hatch appropriation, which Cornell secured in 1888, the trustees organized an agricultural experiment station at Cornell in the fall of 1887. Ignoring the existence of the Cornell University Experiment Station, the trustees established a station council to consist of the heads of the departments related to agriculture, the director of the station, the President of the University, and two trustees, one to be the president of the New York State Agricultural Society and the other a resident of Ithaca.* It was soon decided that the director should not be a member of the faculty. In January, 1888, Adams approached Professor W. A. Henry of Wisconsin for the directorship, giving every indication that his nomination would be approved by the trustees.⁵² Henry was not interested. In March, H. E. Alvord was appointed to the position but declined to accept.⁵³ Finally in April, 1888, Roberts was appointed to the directorship, and provision was made for an assistant director.⁵⁴ With Roberts' appointment a potential source of discord, which might have arisen if the administration of teaching and of research had been separated, was eliminated. Roberts' former student, Henry H. Wing, then at Nebraska Industrial College, was named as deputy director.

The Department of Agriculture to which Wing returned was not substantially different from what he had known in his undergraduate years. Comstock still lectured in White Hall; Prentiss in the south wing of Sage College, where the Botany Department was located; Law met the seniors in agriculture at 8 A.M. daily in McGraw Hall for lectures on veterinary science; and in Morrill Hall, Roberts continued to dispense "knowledge born of experience" in talks not noted for pedagogical form. Only Caldwell had new quarters, having moved into recently completed Franklin Hall. With the exception of Comstock, these men wore luxuriant beards, and Roberts, especially, presented to his students the appearance of an ancient prophet.⁵⁵

*For many years former President White was the resident trustee (*Trustee Proc.*, Oct. 26, 1887, p. 24).

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The only new building used exclusively by the Department of Agriculture was a small dairy house measuring some twenty-four by thirty feet. Completed in 1886, it stood on the present site of Bailey Hall and provided a place for practical instruction in making cheese and butter.⁵⁶

Aside from the Roberts barn, the principal facility of the department continued to be the university farm. It contained 237 acres in 1886, 125 of them under tillage.⁵⁷ Much of the land suitable for cultivation was that now occupied by the athletic field and the buildings of the College of Agriculture.

Students who did not live in the university dormitories continued to board in Ithaca at the foot of the hill. Rooms were available for one dollar a week, and board could be obtained for three dollars, the fare consisting of bread, potatoes, and fried or roasted meat, topped off with pie. James Rice, who entered Cornell as a special student in agriculture in 1887 and later became professor of poultry husbandry, earned his college expenses by managing a boarding house on Linn Street. According to a classmate, Rice established the innovation of allowing his guests unlimited milk—a practice made possible by low milk prices and bulk purchase—and refused to follow his cook's recommendation to dilute it with water.⁵⁸

The rapid change in the Department of Agriculture, following the passage of the Hatch Act, contrasted dramatically with its slow development prior to 1887. Soon after the organization of the Experiment Station was completed, Adams recommended that the academic departments involved in its work be incorporated into a college of agriculture. This was done in June, 1888, when the trustees united the Departments of Agriculture, Veterinary Science, Agricultural Chemistry, Botany, Entomology, and Horticulture into the College of Agriculture and named Roberts dean.⁵⁹ This step was apparently taken to increase the prestige of the work in agricultural education. The College at this time was not an effective administrative unit for the departments remained under the direct authority of the President and trustees.

The Hatch Act opened the way to increasing the personnel in experimental work. Where it had been possible to secure only one assistant, intermittently, before 1888, four assistants were then hired.

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The number of resident teachers was also increased by having men who were brought to the University primarily for experiment station work devote part of their time to teaching. This arrangement, financed by splitting salaries between University and federal funds, was educationally ideal for a teacher sufficiently gifted to communicate the implications of his research to students with limited technical knowledge. This was an opportunity suited to the talents of Liberty Hyde Bailey, who came from Michigan Agricultural College in 1888 to fill the professorship of horticulture.

Bailey's background included contact with unusual persons. A child of the Michigan frontier, he has been fortunate in his early youth in having a teacher who had impressed him with the importance of developing a critical awareness of the features of his environment. This awareness, together with pronounced native talent, made him an outstanding student of botanist William J. Beal at Michigan Agricultural College and later carried him to Harvard University, where as herbarium assistant he became intimately associated with the famed botanist, Asa Gray. Gray was then the peerless leader of American botany; as Bailey knew, this association was a privilege of a high order. After two years with Gray, Bailey was prepared to make significant contributions to the content and teaching of horticulture.⁶⁰

When the trustees made the appointment in April, Bailey had concluded a series of lectures on horticulture given during the winter term.* That his tenure was not made contingent on the continuation of Hatch Act appropriations suggests that he must have made a very favorable impression—not a surprising accomplishment for a young man who had already demonstrated an ability to analyze scientific concepts and dramatize their implications in language that was both accurate and interesting.†

The division of knowledge into increasingly narrow fields, each developing its own language and methodology, had only begun in the 1880's, but Bailey was already aware of how this increasing specializa-

*Cornell University was on a trimester system until 1900.

†Bailey was appointed at a salary of \$3,000, one-third being paid from university funds (*Trustee Proc.*, April 14, 1888, p. 195). On Bailey's contributions to horticulture at Michigan Agricultural College, see Madison Kuhn, *Michigan State: The First Hundred Years* (East Lansing, 1955), pp. 151-153, 170.

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tion threatened to defeat the ends it was expected to attain. "One can never become a successful investigator in any subject," the twenty-seven-year-old specialist in horticulture told the Massachusetts Board of Agriculture in 1885, "if his whole skill and education are confined to that subject. Much of our experimenting is entirely worthless," Bailey insisted, "because the experimenter is not able to grasp the relations which exist between his subject and other subjects akin to it." Bailey saw that the advancement of agricultural knowledge required that the compilation and classification of information keep pace with the trend toward specialization. With intensity of purpose, he set out to fill this need in the broad field of agricultural education. In the same talk Bailey stated his conclusion on the warmly debated question of the relation of science to practice in agricultural education. "Then do not discourage the pursuit of science," he said, "however much you may have been taught to regard it as opposed to practice. Science is practice. All so-called popular and useful science must be founded on recondite facts and principles."⁶¹ An obvious point, perhaps, but stated in a way that would later help New York farmers understand the value of experiment station work.

Bailey was an immediate success at Cornell. His classroom work was well organized and sufficiently interesting to attract numerous auditors. At the end of Bailey's first year, President Adams reported that the twenty acres of the farm assigned to him already showed "the results of his thoughtful and skillful administration."⁶² Although initially dependent on the outdoors for a laboratory, he began construction of a forcing house, which was completed for \$800. At the end of his first year at Cornell, Bailey was granted his own domain through assignments by the trustees of specific buildings and land to the Department of Horticulture.⁶³ During this busy year he also found time to review the contributions made to horticulture in North America and prepare descriptions of these discussions and discoveries for his first *Annals of Horticulture*.^{*}

^{*}*Annals of Horticulture* (New York, 1890), pp. 1-2. For an examination of the origin of Bailey's drive, especially as it relates to competition with a favored older brother and the desire to attain status in the eyes of a puritan father see G. H. M. Lawrence, "The Real Gift of Liberty Hyde Bailey," *Professional Gardener*, Nov., Dec., 1957, Jan., 1958.

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The federal money which made possible Professor Bailey's forcing house also permitted the purchase of other long-desired equipment. Professor Comstock was able to build his "Insectary," where he could study the life cycles of insects and produce the plant food they required, and to secure a \$400 microscope. These new facilities made him, according to his wife, "the happiest entomologist in all America."* At the same time that Cornell was enabled to create more efficient physical conditions for the conduct of agricultural experiments, it was provided with money for publishing the results. The last of the three reports of the old Cornell station had been issued in 1885; in 1888 alone, four bulletins appeared, and by the end of 1889 eleven more had been issued to a mailing list which then included nearly 7,000 names. Federal funds also made possible the purchase from other experiment stations of bulletins which seemed especially relevant to agricultural conditions in New York.†

The experiment station bulletins covered a wide range in content and style of writing. Some were highly technical and required an understanding of scientific terms; others were directed to the immediate needs of farmers. Some were restricted to a single subject; others, like the reports of the earlier Cornell station, included a number of unrelated topics.†† All bulletins were distributed from a single mailing list to recipients ranging from farmers with little formal education to research specialists. A classified mailing list was clearly desirable, but for many years other needs were given higher priority.

Much depended on continued receipt of the Hatch Act fund, and President Adams was not satisfied that this was assured by decision

*Comstock, Anna B. *The Comstocks of Cornell* (Ithaca, 1953), p. 161; the "Insectary" is described in *Cornell Univ. Agr. Exp. Sta. Bull.* 3, 1888.

†Three thousand copies of a Tennessee Agricultural Experiment Station bulletin on the potato blight were distributed to farmers in the potato-growing regions of the state in 1889. (*2d Ann. Rpt. of the Cornell Univ. Agr. Exp. Sta.*, 1889, pp. 7-8).

††For example, Bulletin No. 4 included experiments on planting corn and analyses of "Economic Seed Manure" and of "Curwin's Hog Powder." Bulletin No. 5, dealing with the production of lean animals, is interesting in the light of recent efforts directed toward this subject.

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of the federal comptroller. In February, 1889, James Wood, president of the New York State Agricultural Society and member of the experiment station council, assured Adams that the fund was secure at Cornell. At about this time an agreement was reached by which the Geneva station promised not to ask for any of this money, but three months later a bill was introduced in the legislature calling for its division between Cornell and Geneva. Director Peter Collier of Geneva assured Adams that the bill was a surprise to him and not a matter of bad faith.⁶⁴ Although Cornell's representative in Albany reported, "a great deal of feeling in the Legislature against Cornell," the issue was temporarily resolved by the assignment of the fund to Cornell, only to be reopened at the next session of the legislature. It was then recognized that Geneva's supporters wished to obtain part of the Hatch fund for the franking privilege for station publications. J. S. Woodward recommended that an investigating committee look into the relative merits of Cornell and Geneva and suggested to President Adams how the committee could be packed with Cornell's supporters.⁶⁵ Woodward's advice was not followed.

After 1888 agricultural education received increasing attention from the university authorities. The time was past when a member of the Executive Committee of the Board of Trustees could practically ignore the subject as Mynderse Van Cleef had done in 1887; in reporting that year to the alumni on the condition of the University, he chose to devote five lines to veterinary science and none to agriculture.⁶⁶ D. E. Salmon's report to the alumni in 1889 was the direct opposite. Salmon, then chief of the Bureau of Animal Industry in the U.S. Department of Agriculture, devoted most of his report to the condition and needs of the Department of Veterinary Science and other work in the College of Agriculture. The small enrollment in agricultural work at Cornell, when compared to the 400 students enrolled in Michigan Agricultural College, suggested to Salmon that the University was not meeting the needs of this important segment of American society. The departments of the College of Agriculture, he said, should be brought together within a single building. The small lecture room in Morrill Hall used for instruction in agriculture and horticulture and the museum in the basement, where tools were ruined by dampness, were declared thoroughly inadequate for the

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demands of agricultural education.*

Obviously, Salmon was working closely with President Adams. In his report for 1889 Adams indicated that an agricultural building to cost about \$75,000 was being discussed and added his hope that some friends of agriculture would come forward to provide this amount along with sufficient endowment to support its operation. These efforts apparently produced results; at least, in November, 1889, the Board of Trustees reported having "received an intimation from two of its members that there are two gentlemen, from either of whom the means may possibly be secured as a gift to erect an Agricultural Building."⁶⁷ By February, 1890, plans had been prepared. In describing the anticipated building the *Cornell Era* stated that the initial impetus for its construction came from the alumni report of D. E. Salmon. By October, 1890, the "two gentlemen" had not come forward; but the trustees went ahead and appropriated \$80,000 on the basis of setting aside about \$20,000 each year until a sufficient amount accumulated to construct the building. When the building was complete, the provision for free tuition was to be rescinded.⁶⁸

The decision to establish the College of Agriculture in its own building was a fitting climax to five years of rapid development in research, resident teaching, and extension. In the early 1880's the faculty had been able to reach only local farmers on a regular basis, but with the development of farmers' institutes, they were able to bring the College of Agriculture to farmers in all parts of the state. In this extension work they enjoyed the consistent support of President Adams, who encouraged faculty participation in the institutes even to the point where this interfered with resident instruction.⁶⁹ The expansion of the staff, made possible by the Hatch Act fund, offered a temporary solution to Roberts' need to be several places at once. In 1888 he planned to have Deputy Director Wing attend institutes or take over the agricultural students while he was away on institute work. The experiment station fund also made it possible for

**Proc. of the Associate Alumni*, 1889. Salmon's comparison of the enrollment in agriculture at Cornell with the total enrollment of Michigan Agricultural College was misleading, for the latter included students concentrating on the mechanic arts (Kuhn, *Michigan State*, pp. 147-149).

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the College to provide resident and extension lectures in horticulture. Professor Bailey's attendance at institutes filled a need that had troubled Roberts since the departure of Lazenby.⁷⁰

By 1888 Roberts had established a reputation among agricultural educators for his success in placing the work of the agricultural college before the farmers of the state. In planning the next annual meeting of the American Association of Agricultural Colleges and Experiment Stations, its president, George W. Atherton, wrote to Alvord suggesting that Roberts discuss the topic "How the Station Shall Reach the Farmer." Alvord agreed that Roberts' experience made him ideally suited for this subject. This is not to say that Roberts was always well received by farmers. Once a group in the northern part of the state asked him if he knew how to plow and otherwise so abused his abilities as a practical educator that he remembered years later the stinging rebuff he had received.⁷¹ By 1890, however, such receptions were unusual.

The farmers' increasing knowledge of the activities of the College of Agriculture and increasing approval of its work were the result, in part, of the more favorable attitudes toward the College expressed in the agricultural periodicals circulating in New York State. Luther Tucker's *Cultivator and Country Gentleman* had been cordial since the agricultural faculty made its first feeble efforts to establish an experiment station; the *Rural New Yorker*, however, had been cautious and the *American Agriculturist* openly hostile. During the 1880's, however, the *Rural New Yorker* adopted a friendly editorial position toward Cornell, while continuing to print correspondence attacking agricultural colleges.* In 1884 this publication's editor hoped that Cornell would become the "model agricultural school in America," and in 1886 wrote that 150 agricultural students at Cornell would be a great benefit to the state.⁷² The *American Agriculturist* ceased to attack Cornell during the 1880's. Thoroughly out of step with events, it practically ignored the agricultural colleges during that decade.

Federal funds and an enhanced public reputation did not end the

*The prominent horticulturist, Peter Henderson, regularly accused agricultural colleges of being too scientific and not sufficiently practical (*Rural New Yorker*, May 5, 1883, p. 285).

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frustrations of a limited budget. In 1888 Roberts still was not able to use the college farm to illustrate his classroom teaching, for the trustees continued the policy that the farm should be operated for profit. Out of necessity, trips to farms about the state continued. In 1889 Roberts suggested that the University pay the cost of these trips, since they were a vital part of his resident teaching and much cheaper for the University than maintaining examples of good and bad farm management on the college farm.⁷³ It is unlikely he had any real hope that the trustees would implement this recommendation, as by 1888 their appropriations for agricultural education had increased only slightly over the 1870's.*

The time lag between change in New York agriculture and the accommodation of Cornell's agricultural education to that change was substantial as far as the University's appropriations for agricultural education were concerned. The reluctance of the Executive Committee of the Board of Trustees to make appropriations for academic work was exaggerated, in the case of agricultural education, by the lack of interest this group of Ithaca businessmen showed toward agriculture. Not until 1885 did they recognize the growing importance of dairying to New York State by establishing on a permanent basis the series of lectures in dairy husbandry that had long been given by L. B. Arnold.† Beyond the peripheral benefits from the federal funds allocated to the experiment station, enrichment of the curriculum in agriculture depended largely on volunteer efforts. Such was the case with a series of lectures on personal and real property given by members of the Law School for agricultural students after 1887.⁷⁴

This period of the 1880's, when the faculty of agriculture was struggling to match available means to perceived needs, was remembered by students as a golden age of agricultural education at Cornell. Classes were small, and each student had the benefit of association with men who were continually opening new areas for

*For 1888-89 the total appropriation to the Departments of Agriculture and Horticulture was less than \$8,000 (Treasurer's Report, 1888-89, MS).

†*Trustee Proc.*, June 17, 1885, p. 361. After Arnold's death in 1888 the series of lectures was continued by Professor James W. Robertson of Guelph, Ontario (*ibid.*, Oct. 23, 1888, p. 94).

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investigation.* In discussing the strength of agricultural education in the period, Jared Van Wagenen, Jr., emphasized the personal qualities of Professor Roberts. In 1945 he wrote to his old classmate, James Rice:

As compared to the present the College of Agriculture as we knew it seems pitifully small and primitive but you and I can always boast of one thing that the present graduates will never understand. We had Roberts for a teacher. I explain him by a certain phrase in the Old Testament, "*NOW THERE WERE GIANTS IN THE LAND IN THOSE DAYS.*"⁷⁵

Van Wagenen's reputation as an agricultural journalist lends weight to this opinion; he rarely permitted the dramatic phraseology so characteristic of his writing to detract from his accuracy as a reporter.† Too few of Roberts' letters remain to make a detailed examination of Van Wagenen's judgment, but certainly it is supported by the correspondence that is available. His official correspondence with President White reveals a man of great dignity deeply concerned about his reputation but possessed with a sense of humility that limited his means of advancing it. Letters to his friend and professional colleague, John Comstock, show an unflinching courtesy that goes well beyond the requirements of the formal style of writing then in use.⁷⁶ A letter to a former student suggests other dimensions of Roberts' personality. "It is now 6 P. M.," he wrote, "and so I thought I would give you this fraction of the day so that none might be lost." There follows a detailed description of the new thirty-by-forty-foot addition to the barn, complete with floor plans, with the comments: "All these betterments please me more than anything I have done for a long time. Nothing is fine or expensive but it is satisfying. . . . We have thirty sheep, eight pigs, and fifteen chickens under experimental conditions this winter and we are getting some strange results which may make Hoard and Smith open their eyes." Concluding his three-page letter, Roberts said, "I have already written too

*This point was stressed by L. C. Corbett, then horticulturist in charge, Bureau of Plant Industry, USDA (Corbett to Bailey, Dec. 9, 1912, Liberty Hyde Bailey Papers).

†Van Wagenen wrote extensively for the agricultural press. His *The Golden Age of Hometown* was published by Cornell University Press in 1953.

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much of myself and not enough of others, so with many good wishes for your future prosperity and that of your good people and with hope that we may meet again at no distant day, I remain, yours faithfully, I. P. Roberts."* Roberts did more than write to former students. John L. Stone remembered the time, when he had only recently graduated from Cornell and, with a young wife, was struggling to manage his father's farm that Roberts visited them and offered help and encouragement.⁷⁷

The increasing number of students in agricultural work encouraged further enrollment by spreading Cornell's reputation in other communities. The research of the 1880's opened areas for investigation that required new techniques and equipment; the extension of information through the agricultural press, experiment station bulletins, and farmers' institutes led farmers to desire further information. A contemporary statement by Professor W. A. Henry of Wisconsin reveals the aura of progress which then marked the agricultural work at Cornell. After a visit to Ithaca, he wrote Comstock, "We have come back full of ideas, and with strong determination to push our agricultural department well to the front."⁷⁸ Additional funds were needed after 1888, however, if Cornell were to maintain the momentum it had gained.

As in 1862 and 1887 funds were again provided by the federal government at a crucial time, in this instance through the Morrill Act of 1890. This legislation resulted from Senator Morrill's eighth attempt to implement the request for further federal aid to the land-grant colleges expressed at the Washington convention of 1872 and, most surprisingly, was introduced in Congress without the knowledge of the Association of American Agricultural Colleges and Experiment Stations.† This legislation provided \$15,000 annually to each state and territory, with an increase of \$1,000 each year up to a total of

*"Hoard and Smith" refers to W. D. Hoard, of *Hoard's Dairyman*, and Wing R. Smith (Roberts to James Drew, Dec. 25, 1890, James Drew Correspondence).

†Before 1890 Morrill's bills to aid the land-grant colleges included provisions for federal aid to the common schools (True, *History of Agricultural Education in the United States*, pp. 196-199; circular letter signed by H. E. Alvord, May 19, 1890, New York State College of Agriculture Establishment Papers).

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\$25,000. The land-grant institutions were left to determine the allocation of the fund within the broad limits stated in the act.⁷⁹ At Cornell the trustees appropriated about two-thirds of this Morrill fund for the work of the College of Agriculture. This brought the total appropriation for agricultural education at Cornell in 1890-91 to nearly \$35,000, an increase of \$26,000 over that available in 1886-87.* The increase was almost entirely from federal funds, for the trustees continued to depend on farm income for most of their appropriation for agricultural education.⁸⁰

Other events of the 1880's, seemingly isolated from each other and unrelated to agriculture, were to prove significant for the further development of agricultural education. One of these events was the trustees' decision to move toward the establishment of a separate veterinary college by establishing the Department of Veterinary Science in its own building.† Since the opening of the University, Professor Law had given lectures in animal physiology to the agricultural students, and by 1885 he had trained four veterinarians, but during much of this time he was employed by the federal and state governments in the eradication of bovine tuberculosis. The appropriations for his department during the 1880's were twice limited to \$100 annually, and for two other years to \$200; in 1883 Law did not even complete the form requesting a statement of the needs of his department.⁸¹ Under these circumstances, the trustees' decision to appropriate \$10,000 for a building is surprising, especially when, according to Law, the "department has never been urged upon the attention of the trustees as imperative and vital to the interests of the University."⁸² This amount, which Law considered inadequate, was never spent, through the inability of university authorities to agree on a proper site. (President White was apparently afraid that several hundred feet was not sufficient to dissipate the contagion he expected to emanate from the veterinary building.) In 1886 the amount was

*These figures include funds available to the Departments of Agriculture, Horticulture, and the Agricultural Experiment Station (Treasurer's Rpt., 1891-92, MS).

†In his annual report for 1883, White said, "The Board of Trustees at a former meeting took action looking toward the establishment of a fully equipped veterinary college" (*Rpt. of the Pres.*, 1883, pp. 44-45).

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reappropriated, but again difficulties in selecting a site proved insurmountable.⁸³ The significant aspect of these events for the College of Agriculture was the clear indication that the university authorities were moving toward the establishment of a separate veterinary college.

Another important development was the first state appropriation to establish on a more efficient basis work already being carried on at Cornell University. Professor Estevan A. Fuertes had long been impressed with the importance of systematic weather observations and for this purpose had established an observatory in 1878 in connection with the College of Civil Engineering.⁸⁴ However, this part-time operation was soon inadequate for the rapidly expanding interest in meteorology. By 1883 nine states had established weather services which coordinated their observations and reports with the National Weather Bureau. Fuertes moved to secure a similar bureau in New York State. Writing in the third person, he later reported: "Efforts were made at Albany for three consecutive years to obtain the aid of the State in this work; but, failing to accomplish this, he decided in 1888, to establish mainly by private enterprise, a provisional service which should demonstrate the usefulness of the plans submitted to the Legislature."⁸⁵ The reaction of the trustees to Fuertes' efforts was to "disclaim all responsibility for or interest in" the bill to establish a state weather bureau at Cornell.⁸⁶ The creation of such a bureau in 1889 and the location of its central office at Cornell was a tribute to the work of Professor Fuertes but hardly cast any glory on the judgment of the University's trustees.⁸⁷ Thus began state support for educational activities at Cornell.

The Founder's Day address of 1888 was significant both because of its author, Jacob Gould Schurman, professor of philosophy, and its statement of the relationship Schurman presumed to exist between Cornell University and the state. Cornell, he said, is "a People's University." Free instruction to over five hundred scholarship holders and low-cost education to others made Cornell accessible to all the people without regard to economic considerations, a public service which, according to Schurman, gave the University at least a moral claim for public support. "We are working for the people of every class and profession," he said, "and the wealth of the country cannot pass us by." Logically, the speech should have ended with an appeal

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to the legislature for state support, but Schurman, a master of the flank attack, apparently felt there was no likelihood of success in Albany until the legislature was prepared to accept his view that the state had a special responsibility to its land-grant institution.⁸⁸ The Founder's Day address was the opening shot in a long campaign for state aid.

Schurman enjoyed a close personal relationship with Henry W. Sage and other members of the Board of Trustees, and by 1890 a clique within the trustees was planning to place him in the presidency of Cornell University.* Sage had already clashed with President Adams over the locus of administrative power, insisting, over Adams' protests, that the appointment of faculty members was not the exclusive prerogative of the President.⁸⁹ While the appearance of harmony was maintained, the intrigue between Sage, Schurman, and disaffected members of the faculty had reached the point where a crisis could precipitate the replacement of President Adams by Professor Schurman. The ideas expressed in Schurman's Founder's Day address were not forgotten until the date of his elevation would arrive. In the spring of 1891 Professor Charles A. Collin, almost certainly with the approval of Sage, was collecting information to document specifically the state's debt to Cornell University for educating the students holding state scholarships.⁹⁰ Unlike some trustees of more recent years, Sage was not opposed to using public money in operating the University. However, his position may well have been based on the expectation that state funds could be acquired, like the federal funds under the Morrill and Hatch Acts, without compromising private control.

*Moses Coit Tyler, who was a friend of both Sage and Schurman, recorded in his diary a conversation with A. D. White on Aug. 20, 1890. White "talked much of University matters: said that Sage and Boardman have formed with others a scheme to get rid of CKA and to put Schurman in his place; and that the latter has entered into the project." Entries for Sept. 30, Oct. 31, and Nov. 24, 1890, also deal with the relation of Sage to Adams (Moses Coit Tyler Diaries, MS, Rare Books Dept., Olin Library).

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IN his annual report for 1891 President Adams reflected at length on the remarkable development of agricultural education at Cornell following the advent of federal funds. On that June 11 the agricultural students celebrated these accomplishments, while the plans for the new agricultural building, recently published in the experiment station report, gave further cause for great joy.¹ A banquet was prepared entirely by the students. The menu, bound between a front cover of oak and a back cover of pine, both sawed on the college farm, included sixty edibles, all produced at Cornell.* Speeches by President Adams, former President White, members of the faculty, and President Potter of the State Agricultural Society conveyed the impression that agricultural education had passed through its period of trial to the point where it had become an accepted part of Cornell University's curriculum. In his address, "Training for Farmers," White referred to trustee indifference to agricultural education as something associated with the past.²

The University had recently received an unexpected bequest of \$200,000 from the estate of Daniel B. Fayerweather. A week following the agricultural banquet a resolution was introduced at a meeting of the trustees to draw on this bequest for the immediate construction of the agricultural building. The motion failed to pass, by a vote of seven to seven, with Sage and three other local trustees voting in opposition. That October the trustees, after referring to the need

*The menus were bound with wool from Cornell sheep, and each front cover was decorated with a flower hand painted by Mrs. Wing. The principal ingredient for the sparrow soup was shot from the eaves of the Roberts' barn, and the fish were withdrawn from Fall Creek where it passed by the University farm. Strawberries were served by gardener Charles Hunn, who placed potted plants on the table and allowed guests to pick their own (*Cornell Era*, June 18, 1891, p. 2; James Rice in the *Cornell Countryman*, Feb. 1930, pp. 125-127).

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for "stringent economy," postponed consideration of the agricultural building for a year.³ By June of 1892 rumors had reached Roberts that the money being set aside each year for this building was to be used for another purpose. "I think you do not fully understand how greatly we are cramped for room," he wrote alumni trustee, R. H. Treman. Roberts then shared his small office in Morrill Hall with four others, and six teachers were using the small classroom set aside for the College of Agriculture. Elsewhere in his long letter to Treman, Roberts compared the facilities he thought so inadequate with those of other colleges of agriculture, implying that when so much had been accomplished already, further development should be encouraged. "At the present time it is not egoism to say that the Cornell University Experiment Station stands at the head in the United States, and that the College of Agriculture offers better facilities for giving a practical and liberal education in agriculture than any other institution in the land."⁴ Treman accepted Roberts' statement that the College of Agriculture was in good condition but differed radically in his recommendations. In reporting to the alumni, Treman stated what was to become the position of the Board of Trustees. He considered the appropriation for the College already too large in view of its enrollment of twenty-two students, especially when the enrollment in other divisions of the University was increasing so rapidly. Concentration on student numbers as the sole criterion for judging the success of Cornell's agricultural education led Treman to question faculty participation in farmers' institutes and other agricultural meetings since these took the faculty away from their university duties.*

Adams' last report to the trustees — he had resigned the presidency on May 5, 1892, "on account of grave and seemingly irreconcilable differences of opinion in regard to matters of administrative importance" — urged the immediate construction of the agricultural building. Failure to do so, he said, would imperil the good relations with the agricultural community, which had supported Cornell in its efforts to secure the Hatch Act fund.⁵ When Adams departed from Cornell, to become President of the University of Wisconsin, the

*Treman chose to count only the students who were candidates for a degree. There were 41 enrolled in agriculture in 1891-92 (*Proc. of the Associate Alumni*, Ithaca, 1892, pp. 29-32).

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close personal relations between the Faculty of Agriculture and the President of the University ended. Looking back over the previous seven years, Roberts said that because of these harmonious relations difficulties "peculiar to the College of Agriculture have been met and overcome."⁶

In June, 1892, the Executive Committee reported a deficit of over \$100,000 and recommended the indefinite postponement of the agricultural building. Elaborating on this recommendation, the committee insisted that the state had already been repaid for its generosity to Cornell by free education for agricultural and scholarship students. Referring to the small number enrolled in the College of Agriculture, the committee added, "The simple truth is, that the expenditure for this work has been wholly out of proportion to the benefits which the farmers of the state have been willing to receive." With admonitions about "stern adherence to living within our means" and cutting "every useless expense," the committee concluded that "the maximum of our capital from known resources has been reached."⁷

In 1891 the trustees were faced with pressure from two groups, one advocating the construction of a building for the College of Agriculture, the other demanding a building for the Law School. Lacking the means for satisfying both, the trustees chose to erect a building for the Law School. From a consideration of student enrollment, this was a sound decision, for the Law School was growing rapidly and in 1890-91 had more than twice as many students as were enrolled in agriculture.* The decision was also justified from a financial point of view, because the equipment required for the Law School was relatively inexpensive and could be financed by tuition income. Schurman was realistic in emphasizing the need for state support, since, by 1890, experience both in New York and other states had demonstrated that men of wealth would not come forward to support agricultural education on an adequate basis.

When Schurman took office in the summer of 1892, a plan had not yet been developed for securing state funds. That September, Schurman, Sage, and former Governor Alonzo Cornell considered presenting a proposition to the legislature asking the state to establish a

*122 law students, 52 agricultural students (*Cornell Univ. Register*, 1890-1891).

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veterinary college under the control of the Cornell trustees as soon as the University provided a building for the College of Agriculture to cost at least \$100,000.⁸ By November the trustees decided that the University could not finance this building, and at the meeting on November 10 Chairman Sage appointed a committee to determine the "best means" for securing it. The membership of this committee indicates that the university authorities had already approached state officials, for Governor Roswell Flower would hardly have been appointed without his consent.* On the following day President Schurman gave his inaugural address, which was in its entirety an appeal for state aid to all departments of the University. Again he emphasized the theme that Cornell is a "People's University." "Denominational and private colleges belong in an age which is passing away," he declared; "the future must be with the People's University." In a somewhat lower key he played on the University's great need for money for faculty salaries, for student scholarships, for dormitories, and for publications. Providing this money, Schurman suggested at the end of his address, would initiate no new policy but simply carry out a previous commitment; for "in accepting the land grant from Congress, New York State pledged aid to the institution receiving the proceeds." This address, Schurman later claimed, set forth "for the first time with perfect correctness" the "true relation of Cornell University to the State of New York."⁹

Schurman had established Cornell's claim for state aid on a base sufficiently broad to permit movement in almost any direction, but the immediate effort was aimed toward the establishment of a state-supported veterinary college and state aid for the College of Agriculture. On the fifteenth of December, Schurman and Trustee Samuel Halliday talked with Governor Flower in Albany, and two days later, at the Governor's request, Schurman sent him a memorandum setting forth Cornell's claims on the public treasury. "Your own desire to promote the agricultural interests of the state," wrote Schurman, "coincides so completely with the aims of Cornell University that I entertain good hopes of enlisting your support in our endeavor to make the University more serviceable to the farming population of

*The committee also included Schurman, Roberts, Treman, and A. B. Cornell (*Trustee Proc.*, Nov. 10, 1892, p. 232).

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the state." To the list of the University's needs he added the statement, "Dairy husbandry would be a good place to begin."¹⁰ The trustees had already decided to circularize the members of the legislature and state officials with Treman's alumni report setting forth the needs of the University. The next move was up to the Governor.*

In his message to the legislature on January 3, 1893, Governor Flower used the information which Schurman had provided. He described and praised Cornell's contribution to agricultural education, mentioned the 512 state scholarships, indicated what other states were doing for agricultural education, pointed out that the State Meteorological Bureau was already at Cornell, and concluded, "It is entirely, however, with a view to state advantage that I would urge the concentration at Cornell University of the various agencies for promoting scientific agriculture." Schurman was clearly impressed with the Governor's political finesse. "Your message," he wrote, "recalls the Jeffersonian simplicity of the founders of the Republic. The object seems to be to point out how the state may be enobled and adorned without adding much of anything to present expenditures. At any rate this is what the message actually accomplishes."¹¹

It is tempting, but probably unfair, to dismiss as hypocritical Schurman's declaration: "If Cornell wants money from the State of New York it is simply for the good and glory of the state. The sons and daughters of farmers and mechanics must not be denied in a civilized and Christian country the advantages of the very highest education."¹² Like many of his contemporaries, Schurman understood that God had selected this Christian nation for his special blessing; thus it is likely that sometimes what appears as plain opportunism was to him a step in advancing "higher civilization."

In securing state aid, the cooperation of the Governor was vital; in fact, such a step could hardly have been attempted without his active support. Was it a fortunate coincidence of viewpoint that led the Governor to fall in so thoroughly with Schurman's plans or was

*That Treman's report was distributed is surprising, with his comments on the College of Agriculture and Schurman's desire to secure a building for that college. However, the decision to distribute this report was made before the University's immediate claims had been specified (*ibid.*, Dec. 6, 1892, p. 235).

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he motivated more by his presumed friendship with the Sage family and the persuasive talents of President Schurman?¹³ There is much evidence on the side of the former. During the legislative session of 1892, the Governor vetoed a bill appropriating \$100,000 for distribution to agricultural societies for the awarding of premiums in addition to \$90,000 already appropriated for the same purpose. In his veto message, the Governor went beyond the immediate issue to what he considered the basic need of New York agriculture — a more rapid adjustment to changing economic conditions. New York farmers, he said, should utilize growing urban markets through the production of milk products, poultry, fruit, and vegetables instead of trying to compete with Western farmers in the production of grain. The existing relationship of the state to agriculture, maintained through independent appropriations for premiums at fairs, farmers' institutes, the State Dairy Commission, and the State Agricultural Experiment Station, was a poorly considered vehicle from the Governor's point of view for promoting agricultural adjustment to changing conditions. The Governor's recommendations to the 1893 legislature were a consistent sequel. Along with the concentration of "agencies promoting scientific agriculture" at Cornell, he recommended the establishment of a bureau of agriculture in the state administration; together these organizations could promote the rationalization of the state's relationship to agriculture.¹⁴

The need for an agricultural building was pressing after Cornell established its first short course in the winter of 1892-1893. This course was designed for working farmers who could get away from the farm only during the winter months. The only limitations on enrollment were a minimum age of sixteen and "good moral character."¹⁵ A winter course which would "conform to the necessities of agricultural life" had been recommended by President Adams in 1891; by the following June, Roberts was anxious to undertake this course, modeling it on one developed successfully by Professor Henry at the University of Wisconsin.¹⁶ At Roberts' invitation a group of some eighty farmers, journalists, and agricultural educators, including representatives from the agricultural colleges in Pennsylvania, New Jersey, and Ontario, assembled at Cornell that June. According to J. S. Woodward, the purpose of the conference was "to consult

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over the desirability of certain movements forward in agriculture." Methods of getting more agricultural students at Cornell were discussed and the group recorded itself as strongly in favor of a winter short course. University extension work in agriculture and larger appropriations for farmers' institutes were also recommended. At the close of the conference Woodward said, "We have pushed in the right direction and we have *tried* to push hard."¹⁷ By October 1, 1892, the Cornell winter short course was definite. The *Rural New Yorker*, which plugged it consistently, assured its readers, "The course will be practical in the extreme—with no nonsense about it, but a fair and earnest discussion of the 'why' of the principles that underlie farm operations."¹⁸ Forty-eight students attended during the winter of 1892-1893.¹⁹

By February 8, 1893, arrangements had been made for introducing a bill in the legislature appropriating state funds for the construction of a dairy building at Cornell adequate for instructing two hundred short-course students in making cheese and butter. In the 1890's these industries were widely distributed in the state and provided both the major milk market for New York farmers and a source of employment during all except the winter months.* Schurman reported to his representative in Albany that the Governor was "greatly interested" in the winter course, which was developing most successfully. "The boys are all so delighted with what they are getting that they assure us that we will have two or three times as many next year."† To complete the campaign Roberts got out a circular letter urging the recipient to write his senator and assemblyman urging support of the dairy building appropriation. All states except New York, he said, have supported colleges of agriculture, but New York "has not given a dollar."²⁰ Schurman was optimistic about securing future state aid if the measure passed even in part.²¹ The legislature voted the full \$50,000 requested and in August, 1893, the contract for the

*During the 1890's the opening of the winter short courses was coordinated with the closing of the cheese factories (interview, H. E. Ross, Feb. 15, 1961).

†Schurman to Collin, Feb. 8, 1893, Jacob Gould Schurman Papers. Professor Charles A. Collin, a member of the Cornell Law School, watched over Cornell's interests during this and other sessions of the legislature.

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construction of the dairy building was signed.²²

Anticipating that this building would eventually form one wing of an agricultural hall, it was located where space was available for future expansion — on the east side of the university quadrangle adjacent to Lincoln Hall.* In the course of events, however, a building for the College of Arts and Sciences was constructed on this site, and the dairy building became its north wing. A pipette and acid bottle used in the test for butterfat developed by Caldwell's former graduate student, S. M. Babcock, may still be seen carved into the stone beside the north entrance of Goldwin Smith Hall.

Along with the effort to secure the dairy building, Schurman cultivated the support of farm organizations for his subsequent move to secure the establishment of a state veterinary college. Following Governor Flower's address to the legislature, he wrote officers of the State Grange and the State Agricultural Society suggesting that their organizations might welcome an address by Professor Law on the needs of veterinary education.²³

The projected expansion of public support for Cornell's agricultural education and the closely allied field of veterinary education alarmed the friends of the State Agricultural Experiment Station at Geneva, for that institution would be eliminated if the Governor's recommendation for concentrating the state agencies "for promoting scientific agriculture" at Cornell were implemented. The possibility of losing the support of the State Grange posed a further threat to Geneva. State Master W. C. Gifford said that the Grange regretted its earlier support of the Geneva location and desired removal to Cornell as soon as the state could dispose of the Geneva property.† The Governor's position was crucial. On September 26, he visited the Geneva Station and was lavishly entertained by Senator Hammond and exposed to the station's possibilities for future usefulness.²⁴

*This agricultural hall appears as if completed on the campus map in the *Cornell University Register* from 1892-93 to 1894-95.

†Gifford made this statement in a conversation with Schurman (Schurman to Collin, Feb. 8, 1893, Schurman Papers). In his address to the State Grange on Feb. 6, 1894, Gifford complained that the farmers of the State Grange were not recognized in the management of the Geneva Station equally with "the political farmers of the state" (*Proc. N. Y. State Grange*, 1894, p. 24).

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In 1894 three bills affecting agricultural education at Cornell were before the legislature; one established and made appropriations for a state veterinary college at Cornell, one made an appropriation to support extension work in horticulture at Cornell, and the third allotted 10 per cent of the Hatch Act fund to the Geneva Station. Schurman considered the veterinary college measure essential but made intensive efforts to prevent diversion of any part of the federal experiment station funds from Cornell. The appropriation for extension work came to Cornell without the active intervention of the President.

Schurman skillfully managed Cornell's legislative interests with the able assistance of Assemblyman E. C. Stewart of Ithaca. By January 3, 1894, Schurman had persuaded the newly appointed commissioner of agriculture to recommend increased state aid to Cornell, had prepared the president of the Senate for the veterinary college project, and was having Professor Collin approach members of the legislature about attending the dedication of the dairy building.²⁵ The date of the dedication was set in order to secure the presence of the maximum number of legislators. In planning the ceremony, President Schurman intended to remain in the background. "It is a State College of Veterinary Science that is proposed," he noted, "and the cause might be prejudiced if the President of Cornell University were discovered to be taking too prominent a part in such State affairs."²⁶ However, when the day arrived, President Schurman was very much in the center of events, reminding the twenty-six members of the official party from Albany what other states were doing for their land-grant colleges and what Cornell was doing for New York. The event was something of a love feast, with great praise for President Schurman amid promises of future state aid.²⁷

Assemblyman Stewart observed that "after much work and *log rolling* in executive session" he secured a favorable report on a bill providing \$150,000 for a state veterinary college at Cornell.* On

*A funding bill which would require the state to pay 5 per cent interest to Cornell University on the land-grant fund was also involved in Assemblyman Stewart's logrolling; the funding bill was vetoed by Governor Flower (E. C. Stewart Diaries, II, 71; Malcolm Carron, S. J., *The Contract Colleges of Cornell University: A Co-operative Educational Enterprise* [Ithaca, 1958], p. 35).

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February 20, however, much of his effort was negated by unfavorable publicity following an attempt by Cornell sophomores to disrupt a freshman banquet with chlorine gas, which misfired and resulted in the death of a cook. To that incident Assemblyman Stewart attributed the reduction of the veterinary college appropriation to \$50,000 by the Senate Finance Committee. President Schurman was in no position to press for restitution. Amid press attacks on Cornell following the death of the cook it was decided "to take what the Senate would give and be grateful."²⁸ On March 12, 1894, Governor Flower signed the law appropriating \$50,000 for the state veterinary college. Although insufficient for the building that was desired, it prepared the way for an additional appropriation the following year.²⁹

The state appropriation to the Cornell University Agricultural Experiment Station in 1894 for extension work in horticulture was of more complex origin. University extension work was then a social movement which had "assumed considerable importance and great popularity in this country." This phrase was used by Governor Flower in 1892 in a five-page statement urging the legislature not to promote the extension movement. It is "wrong in principle," the Governor declared, "because it taxes the majority for the benefit of the few" and its support would place an incalculable burden on the finances of the state. The \$10,000 appropriation made in 1891 to the Regents of the State University for promoting university extension was not, he urged, a precedent to be followed.³⁰ The Governor's position, consistent with the state's policy of limiting aid to colleges to short-term grants for narrowly defined uses, did not close the door to extension work in agricultural education, for in this context extension became a means for carrying out the state's declared policy of aiding agriculture.

The impetus the movement for state aid to agricultural extension work received from the conference held at Cornell on June 10 and 11, 1892, was supplemented by the work of Professor Liberty Hyde Bailey and his assistant, E. G. Lodeman, in Chautauqua County. They had been working in the orchards and vineyards there and had met a local fruit grower, John W. Spencer. Many years later Bailey told Mrs. Anna Comstock how Spencer in 1894 stood behind Assemblyman S. F. Nixon in securing the legislation enabling Cornell to

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conduct extension work in horticulture in sixteen counties of western New York: "It was by the efforts of Mr. Spencer working through the Chautauqua County Horticultural Society that the thing was largely done . . . It was Mr. Lodeman, I think, who put the question of state help up to Mr. Spencer."³¹

By 1894 Governor Flower had changed his attitude toward continued support for the Geneva station, and in 1894 his message to the legislature recommended that it receive "ample appropriations."³² Following this recommendation, a bill allocating 10 per cent of the Hatch Act appropriation to the Geneva station was introduced. Although Professor Roberts had been advised to let Geneva have the \$1,500 in order to secure the franking privilege, he strongly opposed any diversion of federal funds which would result in curtailing valuable work in entomology and horticulture. Schurman supported him in this. Together they wrote to stations in other states to determine how Hatch funds were allocated elsewhere. A. C. True, director of the Office of Experiment Stations, and Charles W. Dabney, assistant secretary of agriculture, supplied information and personal support.³³ On the basis of this information, the University prepared to argue that division of the fund would not only greatly handicap the work at Cornell but would be illegal, since it would have the effect of disestablishing the Cornell Station. This statement reflects the animosity then existing between Cornell and Geneva, for it was specifically charged that Geneva's action was motivated by unfriendly sentiments. With an additional \$6,000, claimed Schurman, the Cornell Station could do all the work accomplished at Geneva with an appropriation of \$66,000.³⁴

Bailey called this measure "the Geneva *Steal Bill*" and was anxious to have the Governor reject it. He was also anxious to have the extension bill approved. When they reached the Governor, however, both measures had been incorporated into a single bill which also provided an \$8,000 appropriation for extension work at the Geneva Station. The form of this legislation made opposition by Cornell difficult. When the law was signed by Governor Flower, the Cornell trustees decided to take no legal action.³⁵ This did not, however, end conflict with Geneva. In response to a warning from John W. Spencer, Schurman asked Nixon to reduce the appropriation requested for

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Cornell's extension work in 1895 from \$50,000 to \$16,000 in order to avoid further friction with Geneva.*

The Council of the Cornell University Agricultural Experiment Station was empowered to carry out the provisions of the law authorizing extension work in horticulture, subject to the approval of the Executive Committee of the trustees. In June, 1894, the Council appointed Bailey chief horticultural expert and authorized five assistants to help him carry out "a definite line of experimentation," the preparation and issuance of bulletins, and the presentation of schools of horticulture. These objectives were designed to meet the expressed desires of farmers in western New York, who wanted members of the station staff to inspect their orchards, conduct experiments on their own premises, and provide lectures by means of itinerant schools.³⁶ This threefold approach established organized extension work on a sound basis. The results of the experimental work at Ithaca and other experiment stations were extended to farmers through bulletins calculated in form and content to communicate with readers who lacked a technical vocabulary. The experimental work under the Nixon Act, consisting primarily of tests to determine the best horticultural practices under a variety of conditions, was quite different from the controlled experiments conducted at Ithaca and Geneva. It was hoped that farmers observing these tests would raise questions relating to fundamental problems which could be treated in extension bulletins or itinerant schools.

The extension work was an immediate success. Fifty-eight students attended the first School of Horticulture, held at Fredonia, Chautauqua County, December 26-29, 1894. In November, 1895, nearly twice that number attended a three-day school at Jamestown. These schools were based on sound educational practices. Both morning and afternoon sessions began with an effort to develop skill in observation. A twig, fruit, flower, or other object was examined by

*Schurman to Spencer, Feb. 11, 1895, Schurman Papers. According to Roberts, relations with Geneva were unfriendly throughout the administration of Director Peter Collier (Dec., 1887-June, 1895). After Collier's departure from Geneva a number of pamphlets attacking Cornell were found in a closet there. Roberts incorrectly dates the division of federal experiment station funds after the administration of Director Collier (*Autobiog.*, pp. 228-229).

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each participant, who was then asked to explain what was seen. This was followed by a lecture of rather fundamental character designed to interest the listener and stimulate his thinking. Evening lectures were often illustrated with lantern slides, which were in the 1890's something of a treat. Synopses of the lectures were given to the participants at the end of the school.³⁷

In 1895 a series of "spring rallies" was initiated, with two or three people from Cornell present at each. Bailey's purpose at these meetings was "to send the farmer into the season's work with such an initial velocity that he could not stop himself before the harvest time. There were plain direct talks about philosophy of tillage, fertilizing the land, conservation of moisture, and the like, instructions about spraying, and sometimes talks about insects. An orchard was generally sprayed for the purpose of explaining the operation." The interest in these field lectures and demonstrations was phenomenal. Bailey reported that in 1895 he addressed a single audience numbering between three and four thousand farmers. "Surely," he concluded, "the time is ripe for sowing the seeds of the new agriculture." Bailey was concerned about the farmers who were not participating in the extension work. "The results of the experiment station work must be carried to every farmer's door," he said, "and if he shuts the door, they must be thrown in at the window."³⁸

In 1896 the appropriation for the extension work in horticulture was increased to \$16,000, the work to cover twenty-two counties or about one-half the agricultural area of the state. The Chautauqua County farmer who had secured the original extension appropriation was active in the extension work, although his name rarely appeared in the experiment station bulletins.³⁹ "It may interest you to know," Bailey wrote his publishers in January, 1896, "that the man who is really behind this movement is John W. Spencer." He was described in the same letter as "one of the most progressive and intelligent farmers whom I have ever met."⁴⁰ Spencer was fascinated by the principles of nature that underlie farm operations and believed that these principles should be understood by children. In 1896 he and George T. Powell, a former director of farmers' institutes, visited fifty-four public schools, trying to interest teachers and students in nature study through "object lesson teaching," thus applying in the

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rural school a technique that had been used successfully in the horticultural schools. The teachers in these fifty-four schools, "without exception," agreed to cooperate if only they could themselves be instructed in proper methods for presenting nature study to children. This need Bailey proposed to meet through the preparation of nature study lessons for teachers. By December, 1896, he completed *How a Squash Plant Gets Out of a Seed*.⁴¹ This was the beginning of the Cornell program in nature study.

The following year the state appropriated \$25,000 to Cornell for extension work throughout the state in all phases of agriculture. This decision to broaden the scope of Cornell's extension work was in part an outgrowth of the accomplishments of the previous three years and in part, the result of acquiring a broader basis of support.

During the three years extension work was developing under the Nixon Act, the Board of Charities of New York City was becoming concerned about the increasing number of migrants from rural areas who were seeking charity. To halt this influx of the rural poor, they determined to improve the conditions under which these people labored. A Committee for the Promotion of Agriculture was formed under the chairmanship of Abram S. Hewitt, which included such men of wealth as Jacob Schiff and William E. Dodge. This committee employed George T. Powell to initiate an experimental nature study program in the Westchester schools as an approach to the improvement of rural life. The success of this program led Hewitt to see Nixon, then chairman of the Ways and Means Committee of the Assembly, to urge him to increase the extension appropriation for Cornell.⁴²

Experiments conducted by farmers in cooperation with the Cornell staff evolved to a more organized basis in 1897. Four hundred and sixty farmers asked to participate in experiments to determine the fertilizer needs of particular crops. Two hundred and thirty farmers were selected from forty-five counties to receive, free of charge, 160 pounds of fertilizer. Forms for reporting the results were provided by the College, and almost all of these were returned. In the same year, five hundred cooperative experiments in sugar beet culture were undertaken in order to encourage New York farmers to investigate the sugar beet as a possible crop for New York agriculture and to

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determine the locations best suited for its production. In June, 1897, President Schurman reported that "experience has induced" the College of Agriculture to subordinate these cooperative experiments to the extension lectures and nature study leaflets.⁴³ Perhaps this decision was made after judging their relative value as educational media; perhaps because the extension lectures and nature study work had greater public support. It was in that year John W. Spencer joined the Cornell staff.⁴⁴

The Morrill Act of 1890 made possible the expansion of resident instruction in agricultural education during the 1890's, but in a way much less dramatic than the expansion of extension. In February, 1891, a Department of Animal Industry and Dairy Husbandry was created, and in April, Henry H. Wing was named assistant professor in this department, in addition to his duties as deputy director of the Cornell University Agricultural Experiment Station.⁴⁵ He immediately began a spring trimester course in dairy industry, which met daily from 5 A.M. to 10 A.M. In spite of the early hour, the six students went through the term without a single cut.⁴⁶ The Morrill fund also provided \$500 to employ James E. Rice as assistant in agriculture. While a student, Rice had insisted that poultry husbandry was a proper subject for an agricultural college, and in 1891 Roberts gave him an opportunity to try out his ideas. The first poultry house was constructed without authorization by the trustees; Rice and Roberts erected the structure with their own hands, using scrap lumber for building material.⁴⁷ In 1892 Rice began what Roberts described as "the first systematic, practical, and scientific course in poultry culture" in the United States. That year other assistants gave instruction in minor agricultural industries and mathematics as applied to agriculture. Continued expansion under Morrill funds was prevented when the trustees assigned a smaller part of these funds to the College of Agriculture after 1896.⁴⁸

In 1896 the meaning of the "College of Agriculture" was changed by a general reorganization in which the academic work of the University was differentiated into separate colleges. With the exception of the School of Law, a single faculty had considered all educational questions since the University opened, but the growth of the student body and the delineation of technical courses within the

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curriculum made it seem desirable to group faculty and students into colleges. Thereafter matters relating to the academic work of students in the College of Agriculture were considered by the Faculty of Agriculture, which held its first meeting as a formally organized group on September 26, 1896.⁴⁹

The relation of the members of the Faculty of Agriculture to the President of the University was much the same as before this reorganization. The close personal contact which had existed with President Adams had been replaced by a relationship at once distant and impersonal, of the sort conducive to a breakdown in communication. Two events occurring in 1895 reveal the extent to which the sound relationship existing before Schurman's accession had deteriorated. That winter Professor Roberts was elected to the presidency of the New York State Agricultural Society, which under the University Charter made him a member of the Board of Trustees. Instead of congratulating him on the eminence he had achieved and relying on his judgment, Schurman called Roberts in and rather gratuitously informed him that a member of the faculty could not participate in trustee affairs.⁵⁰ In 1896 Bailey made a matter of public record Schurman's failure to coordinate the construction of the veterinary college buildings with the work of the Agricultural Experiment Station:

We have . . . suffered a serious loss during the past season in the wanton destruction of all our cherry orchard, our entire vineyard, nearly our entire collection of native plums, and a lot of seedling currants and other plants by the grading which was done to provide for a site for the State Veterinary College. These plantations were devastated without warning, and the work of several years was irrevocably lost.⁵¹

Schurman showed much greater finesse in his conduct of the University's external affairs. By 1896 the University had secured \$200,000 from the state for building construction, \$150,000 of it for the Veterinary College. With the state committed to this extent, Schurman pressed for permanent state maintenance of the Veterinary College. He had been politically sagacious in deemphasizing the need for continuing appropriations when attempting to secure state funds for building purposes. The resolution of the Cornell Board of Trustees

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of June, 1894, disclaiming any financial responsibility for the operation of the Veterinary College was given little publicity. When the bill to provide maintenance came up, many legislators were surprised to learn that further appropriations were expected by Cornell.⁵² Schurman asked former Governor Flower, who had joined the Board of Trustees on Schurman's urging that he could be of great value in the future, to appear in Albany in support of the maintenance appropriation for the Veterinary College.⁵³ In 1896, \$25,000 was secured. The question of administration remained. Schurman had advised Collin in 1895 that "unity, harmony, and efficiency of administration" would be secured if the College were placed under the charge of the University's trustees with their number augmented by the commissioner of agriculture.* The administration act for the New York State Veterinary College, passed in May, 1897, was everything Schurman desired; complete "custody and control" of the College's property and maintenance appropriations was vested in Cornell University.⁵⁴

Within the University, administration of the Veterinary College was placed in the hands of a director who was to act according to rules established by a Veterinary College Council. Established in January, 1897, this Council included the President and treasurer of the University, the director of the College, and two members elected by the faculty of the College. However, the Executive Committee of the Board of Trustees remained the ultimate decision-making body in the University; decisions of the director and the Council were subject to its approval.⁵⁵ The establishment of a separate Veterinary College did not lead to the immediate separation of veterinary and agricultural education. After his appointment as director, James Law continued as a member of the staff of the Cornell University Agricultural Experiment Station.†

In 1898 the legislature increased the appropriation to Cornell for the extension of agricultural knowledge to \$35,000, bringing the state

*Schurman to Collin, Oct. 17, 1895. The commissioner of agriculture was added in legislation enlarging the Board of Trustees in 1896 (*4th Ann. Rpt. of Pres. Schurman*, 1895-96, p. 6).

†Law reported to Roberts as veterinarian of the Experiment Station through 1898. He continued as a member of the Experiment Station staff until 1903.

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appropriation for agricultural education to almost twice the amount then received from the federal government. In January, 1898, the Faculty of Agriculture recommended the division of the work done under the Nixon appropriation by the establishment of two coordinate bureaus, with Bailey to be chief and Spencer deputy chief of the Bureau of University Extension of Agricultural Knowledge, and Roberts to be chief of the Bureau of Investigation in Agriculture. The faculty also recommended a budget which included eleven employees in addition to Roberts, Bailey, and Spencer. In approving the budget, which included a reserve fund of nearly \$10,000, the trustees authorized such minor adjustments as might be agreed upon by the director and Faculty of Agriculture. In June, 1898, both the extension work and the Experiment Station were placed under the supervision of a six-member Agricultural College and Station Council, which was made responsible for the administration of all public funds coming to the College or the Station.⁵⁶

This expansion of the work in agricultural education, along with the parallel development of agricultural extension and experimentation in other states, created a demand for agricultural educators similar to that which existed in the early 1870's. John L. Stone, who became assistant in agriculture in 1897, recalled that Roberts "raked the country, to find helpers in that work, and that was when he caught me."⁵⁷ In 1898 assistants were also appointed in horticulture, botany, chemistry, entomology, and dairy husbandry. Among them were Benjamin M. Duggar — who was later to be professor of plant physiology at Cornell, the Missouri Botanic Garden, and the University of Wisconsin, and who was to discover aureomycin — and Wilhelm Miller, later editor of the *Garden Magazine* and professor of landscape horticulture at the University of Illinois.⁵⁸

The larger Nixon appropriation enabled Roberts to employ enough assistants to supervise the cooperative experiments more closely. Such supervision was required if these experiments were to be effective, either as teaching devices or as a means for testing agricultural practices; for the farmers most in need of the information these experiments provided were unable, on their own, to lay out and maintain the necessary plots. The experiments with fertilizers continued, for many years of study are required to determine the adaptability of

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fertilizers to a variety of soils and crops. To these was added a series of tillage experiments to determine the relation between crop production and methods of tillage. Personal help was also given farmers who would cultivate small areas as "object lessons" to others.*

The nature study program expanded rapidly under Bailey's direction, establishing for the first time the connection between the University and the public schools that had been contemplated in 1865. Cornell's assistance was available to all public school teachers, rural or urban, who wished to introduce their students to nature study. Bailey feared that the effectiveness of the program would be destroyed if the school teachers did not approach the work with enthusiasm: "The teacher must first of all feel the living interest in natural objects which it is desired the pupils shall acquire. If the enthusiasm is not catching, better let such teaching alone." The formalities of fixed curriculum, recitations, and examinations should be studiously avoided, he warned. Ten minutes a day for one term of "short, sharp and spicy" observation of plants he thought more valuable than a whole botany textbook.⁵⁹ For Bailey the purpose of nature study was to place the child "in living sympathy with everything that is."⁶⁰ To reach this goal, he helped teachers overcome their dependence on pedagogical techniques which had evolved for other purposes.

By April, 1898, eleven nature study leaflets for teachers had been prepared by six authors. The variation in style and content reflected the range of talents and interests of the authors. Mary F. Rogers and Anna B. Comstock, for example, wrote as teachers communicating with other teachers; Simon H. Gage wrote for both students and teachers in his *The Life History of the Toad*; and Bailey, with marvelous perception, wrote in a fashion which assumed that the teacher

*Until December, 1900, the College shipped 160 pounds of fertilizer to each cooperator free of charge. Thereafter the College arranged with a manufacturer to provide 260 pounds divided into seven lots of different analyses for \$4.00 (*Cornell Univ. Coll. of Ag. and Agr. Exp. Sta. Circ. 20*).

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retained some of that innocent enthusiastic curiosity characteristic of childhood.*

While these leaflets for teachers were being prepared, John W. Spencer was organizing Junior Naturalist Clubs. When a group of children signed a membership list and elected their officers, Spencer sent a charter and badges for each member. The member paid his weekly dues to Cornell in the form of a letter or drawing showing what he had learned about nature during the week. By May, 1899, 135 clubs had been formed. Many of these were located in larger cities and forty-five of them were in other states.† “Do not worry about your spelling and punctuation,” Spencer told the junior naturalists, “for these will improve as you develop your ideas and powers of observation. Please do not be afraid of us,” he urged, “but write us as you would to an old friend of whom you are very fond.”⁶¹

The Cornell program in nature study was eagerly received in all parts of the country. By June, 1899, 25,000 teachers were receiving the nature study leaflets, a large part of this number going to other states. A series of publications written especially for the junior naturalists was already under way, and in June, 1899, these were coordinated with the teachers' leaflets, four of each being issued yearly. In initiating the new series of nature study bulletins, Bailey said: “We appeal to every person who loves his kind and his country to help us. We need the cooperation. We can do nothing alone. We want to know the shortcomings and the mistakes. We want to reach every child in New York State; and we hope that others will carry the movement beyond our boundaries and make it better.”⁶² The enthusiasm of the

*The following passage from “The Birds and I” is typical of Bailey: “The birds remember the old places. The wrens pull the sticks from the old hollow rail and seem to be wild with joy to see the place again. They must be the same wrens that were here last year and the year before, for strangers could not make so much fuss over an old rail” (*11th Ann. Rpt. of the Cornell Univ. Agr. Exp. Sta.*, 1898, p. 99). The nature study leaflets were bound at the end of the annual reports of the Experiment Station until 1919.

†*12th Ann. Rpt. of the Cornell Univ. Agr. Exp. Sta.*, 1899, pp. 637-643. Bailey later said the idea of organizing children into clubs for the study of outdoor objects originated with Spencer (*Cornell Univ. Agr. Exp. Sta. Bull.* 206, Oct., 1902, p. 177).

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Cornell University faculty was tremendous — Roberts called it “true missionary spirit.” Many of the nature study bulletins were written by people outside the College of Agriculture who advanced the work without financial remuneration.⁶³

Through cooperation with the Department of Public Instruction, a nature study instructor was hired in March, 1898, to attend teachers' institutes.* During the year the instructor presented the case for nature study to some 14,400 teachers at seventy-two institutes. Sufficient time was made available to explain the techniques and philosophy of nature study work and help liberate teachers from the conviction that examinations are the measure of all things educational. So great was the demand for instruction in nature study techniques that a summer school was organized at Cornell in 1899 to provide instruction in insect life, plant life, and the relation between man and nature on the farm. By June, 1899, 111 teachers were enrolled.⁶⁴

In 1898 a series of reading courses for farmers was introduced in order to make rural life more profitable and enjoyable. The ultimate objective was to improve farm management by giving farmers a better understanding of the cause-and-effect relationships underlying everyday farm operations. Previously, the College had suggested a list of books which could help farmers achieve this understanding, but this did not work because most farmers had not yet learned to think of books as sources of useful information on agriculture. The first lessons were directed toward the perennial question received by the Experiment Station: How can impoverished lands be restored to their original productive power? The first two lessons explained the principles involved in the formation and tillage of soil, the third lesson considered the meaning of fertility, and the next two, the means by which plants secure food from the soil and air.† Each lesson was accompanied by a list of questions designed to make the reader apply the lessons to his own farm situation. Farmers were encouraged to form study clubs to discuss the lessons, with the possibility of a visitor from Cornell held out to the group which had the largest attend-

*These institutes were the principal method of in-service training for teachers, most of whom had only a normal school education.

†The educational impact of these lessons was not compromised by insistence on technical accuracy.

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ance and made the fullest replies to the questions. In some cases public-spirited farmers were employed to organize a club in their neighborhood.⁶⁵

The model for these ventures in adult education was the Chautauqua reading course, then at the height of its popularity. Over the state, adults were trying to bridge the gap between the rudimentary education of their youth and that required in a society undergoing rapid technological change. However, in providing basic education for a highly complex occupation, Cornell was going beyond its model. The problem of communication was tremendous. To be effective the reading course had to deal with the condition of the student; but this varied, both with regard to the student's ability to assimilate written information and with regard to his farming experience. Elementary education on a mass basis presumes a large number of common factors but in the diversity of New York agriculture these common factors were limited. By 1898 the organization of the itinerant schools of agriculture, horticulture, and dairy husbandry was proving difficult in some parts of the state, for specialized information was desired, in many cases, by men who lacked the basic education needed to give meaning to the more advanced instruction. In 1898 it became extension policy to organize these schools around a core of experience, either a common agricultural speciality or attainment of a similar level of basic education. Reading courses and farmers' institutes were considered desirable prerequisites to the itinerant schools.

During the winter of 1897-1898, a total of 280,000 pages of literature was distributed to 7,500 farmers enrolled in the reading course. By 1900 enrollment had increased to some 20,000 farmers. Reading course bulletins by this time showed some departure from the original philosophy of minimizing the handicraft aspect of farming. Three bulletins of that year dealt with balancing rations for livestock feeding; one was specialized to the extent of giving sample rations for milk cows. These bulletins attempted, through numerous references to an experiment station bulletin dealing with livestock feeding, to introduce the reader to this more technical form of communication.⁶⁶

Instruction in skills having immediate application was provided in the eleven-week winter courses. Two courses were given in the 1890's, general agriculture and dairy husbandry. The latter, emphasizing the

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manufacture of cheese and butter, attracted more students than the work in agriculture. By the end of the winter course in 1898, 194 students had taken the course in dairy husbandry. These students, Roberts reported, helped make New York State cheese competitive in foreign markets with that of Canadian manufacture, long favored because of its consistent high quality. By this time the winter courses were considered full, the facilities available being inadequate for a larger number of students.⁶⁷

The number of regular students did not increase appreciably over the previous decade, with the single exception of the year 1897-98. After that sudden increase in enrollment, the entrance requirements for the agricultural course were made equivalent to the course in arts, which added a full year to the time needed to prepare for entrance.⁶⁸ Roberts attributed the decline in the number of regular students the following year to the increased entrance requirements, which were then "somewhat modified." Further modification he thought desirable until the admissions requirements were comparable to the instruction available in the secondary schools. This was also the position of the *Country Gentleman*. In considering the agricultural course, it added that in an age of specialization agricultural students should take only agricultural subjects.⁶⁹ President Schurman arrived at this same conclusion by a different route — consideration of the University's finances. To prevent arts and science students from utilizing the free tuition, he recommended that all four years of the agricultural course be composed strictly of agricultural subjects.⁷⁰

Student enrollment in the College of Agriculture for the years 1891 - 1900 was as follows:⁷¹

<i>Years</i>	<i>Regular</i>	<i>Special</i>	<i>Graduate</i>	<i>Winter</i>
1891-1892	22	19	12	
1892-1893	24	24	9	48
1893-1894	25	20	9	61
1894-1895	24	21	9	77
1895-1896	30	21	13	83
1896-1897	34	34	20	60
1897-1898	56	28	20	93
1898-1899	46	39	17	89

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<i>Years</i>	<i>Regular</i>	<i>Special</i>	<i>Graduate</i>	<i>Winter</i>
1899-1900	43	45	19	83
1900-1901	48	50	23	94
1881-1890	250	82	12	
1891-1900	352	301	151	688

Although tuition remained free, part of the cost of agricultural education was transferred to the students through the establishment of term fees.* The fixed fee had been preceded in 1887 by Roberts' requirement that students in the dairy course buy their own milk and become owners of their cheese, be it good or bad.⁷² In terms of educational outcomes, this was clearly more desirable than the fixed fee but also more difficult to administer. The substitution of the term fee, made necessary by the increasing number of students, involved a gain in administrative efficiency at the loss of opportunity for education.

The transfer to administration of particular aspects of the educational process and the consequent isolation of these aspects from the student-teacher relationship had then only begun. Close personal relations continued between members of the College. Agricultural students were often transported to meetings of farm organizations free of charge by the railroads, and in 1898 when Roberts rose to speak to members of the Western New York Horticultural Society he was greeted by a brisk Cornell yell.⁷³ After completing a letter to a former student, Roberts turned it over to his assistant who added a note of greeting of his own. Students were frequently invited to faculty homes. "We had a good time and a good sing," wrote R. A. Pearson after a reception at Professor Wing's home.⁷⁴ The organization of agricultural students which had existed spasmodically since the early 1870's was then an active affair.⁷⁵ At the annual Agricultural Association banquet in 1894, over 125 students and guests were present.⁷⁶

Aside from the establishment of the winter courses, the most nota-

*In 1893 a \$5-per-term fee was levied on agricultural students and a \$10 fee established for the dairy husbandry course. In 1895 the agricultural term fee was increased to \$7.50, the dairy course to \$15 (*Trustee Proc.*, July 26, 1892, p. 209, Nov. 14, 1893, p. 295, Feb. 19, 1895, p. 359).

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ble change in student enrollment during the decade 1891-1900 was a twelvefold increase in the number of graduate students concentrating on some phase of agricultural science. Many of the graduate students whose major subject was in the College of Agriculture received their undergraduate training at Cornell but institutions in twenty other states and two Canadian provinces were represented, as well as the Graduate Institute of Forestry in St. Petersburg, Russia. Most of the graduate students came from the larger state colleges and universities; Michigan Agricultural College sent six students — twice as many as any other — but three students came from the Agricultural College of South Dakota and two from Acadia College in Nova Scotia.⁷⁷

By 1900 nearly \$65,000 a year was available for agricultural education at Cornell, of which about \$55,000 came from the federal and state governments.* The staff of the College and Station included over twenty-five people who had, by the end of 1900, prepared 185 experiment station bulletins in addition to the farmers' reading courses and nature study leaflets. That November John Craig was appointed as a full-time extension professor. The selection of this experienced horticulturist to head the extension work brought Cornell substantial praise from the *Country Gentleman*.⁷⁸

We may wonder how much of this outpouring of information proved useful to its recipients. Those on the mailing list were required each year to acknowledge receipt of the experiment station bulletins, and in 1892 over one-half of the 14,000 names were dropped because the recipients did not send a postcard to Cornell.⁷⁹ Part of the difficulty was the inability of farmers to understand the bulletins, a condition which the expository bulletin and farmers' reading course were designed to meet. It was the technical bulletins, usually published in smaller editions of 5,000 which probably had the greatest immediate impact. These bulletins were the principal means for communicating results of research conducted at the Cornell Station to other agricultural educators. Of little immediate relevance to farmers' production problems, they were fundamental for the

**Laws of New York*, 1900, chs. 418, 419; Treasurer's Rpt., 1900, MS. The \$10,000 appropriation from the University included that made to the Departments of Agriculture and Horticulture.

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advancement of agricultural science. However, there was an unfortunate overtone which the prestige of the Cornell Station lent to its technical publications; that is, the workers at the newer experiment stations were inclined to conclude uncritically that Cornell's methods and results applied in environmental situations quite different from those at Ithaca.*

Many of the experiment station bulletins dealt with "common-sense" matters known to farmers in a general way but unknown in their particulars. The approximate gestation period of cattle was common knowledge but its range and average length could be established only by recording a large number of cases. It was surely a rare farmer who had no theory on the relation of the length of gestation to the sex of the offspring, but this question, too, was settled by extensive observation.⁸⁰ Other bulletins dealt with new techniques in agriculture. Dehorning cattle had been practiced for about five years prior to 1893, but its uncertain legality led Roberts to compile a group of court cases for dairymen to consider.⁸¹ The desirability of spraying orchards was widely recognized, but the proper timing of these applications was determined through numerous trials. By 1900 it was definitely established that spraying apple trees in bloom affected the crop adversely.⁸² Other bulletins, especially those in entomology, were descriptive. In November, 1900, Mark Slingerland, described a "new beneficial insect," the praying mantis, first discovered in New York State in 1899.⁸³ Quite different from the bulletins containing new information were those designed to extend existing knowledge to farmers. "It is hoped that they do not contain a single new fact," wrote Bailey in 1896 when inaugurating this new type of experiment station publication.⁸⁴

In the 1890's farmers' institutes were probably more important than bulletins as a means of acquainting farmers with the work of the Cornell University Agricultural Experiment Station. The institutes had the advantage of bringing the farmer into direct contact with agricultural experts in an informal situation where his interest, already established by the decision to attend the meeting, was height-

*This point is made rather strongly by E. W. Hilgard, director of the Agricultural Experiment Station at the University of California, in a letter to Bailey, Oct. 8, 1896, Bailey Papers.

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ened by interaction between himself, the speakers, and his neighbors. A common appreciation of the practical problems of farming was the basis of rapport between farmer and institute speaker. It was a mark of confidence when institute lecturer James Rice was asked, "How were *your* apples last year?"⁸⁵ While anxious to communicate the implications experiment station research had for New York agriculture, the Cornell staff studiously avoided creating undue expectations of what these stations might accomplish, for the memory still lingered of how agricultural science had been retarded by the uncritical acceptance of Liebig's mineral theory in the 1840's. Farmers were cautioned that they must examine experiment station results in relation to their own situation. "The thought I want you to carry home," said Roberts at the conclusion of an institute, "is that in agriculture, as in religion, you must work out your own salvation with fear and trembling."* Nevertheless, much of the research conducted at Cornell during the 1890's, and that of Roberts in particular, gave the farmers considerable guidance in accomplishing that salvation.

Roberts' experiments with ensilage were comparable to earlier experiments with manure in their economic value to New York agriculture. The expansion of the livestock industry in the state — especially dairy cattle — depended on the availability of a palatable and inexpensive source of animal nutrients during the winter months. Green roughage or ensilage had long been considered such a source, but spoilage in the early silos — simple pits below ground level or extended above the ground with board sides — was excessive.⁸⁶ Roberts tried various methods to prevent air from decomposing the ensilage, first by compressing it with large screws and later by covering it on different occasions with stones, earth, and straw. While most of these attempts failed to produce a feasible method, they were important to farmers in pointing out what would not work and by encouraging the examination of new approaches. In 1898 Roberts drew on the experience of others to construct a stave silo, the fifth in the United States.⁸⁷ This cheap, durable, and relatively effective

**Trans.*, 1896, pp. 636-637. The number of farmers' institutes held annually in New York State increased from 100 in 1890 to 296 in 1900 (John Hamilton, "History of Farmers' Institutes in the United States" [*USDA Office of Exp. Sta. Bull.* 174, 1906], p. 69).

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storage for green roughage was adopted rapidly in the state after its construction was described in a bulletin issued in March, 1899.⁸⁸ The variety of corn, its maturity, the length of cut, and the type of preservative were also known to affect the quality of the ensilage and were being studied along with the construction of silos.⁸⁹

Sugar beet investigations begun in 1893 had a less fortunate effect on New York State agriculture. These experiments were conducted on a cooperative basis, with the United States Department of Agriculture furnishing the seed, which was distributed to farmers in the state willing to cooperate. The results of these experiments were published each year in a station bulletin. It was then government policy to decrease the nation's dependence on cane sugar produced in Spanish possessions by developing a domestic supply of beet sugar. In 1899 beet sugar factories were located at Binghamton and Rome; by 1901 New York State's two factories each had a daily capacity of 600 tons of beets.* By this time the Cornell Station had found beet pulp to be an excellent food for cows.⁹⁰ "That sugar beets can be grown in this State with profit has been amply demonstrated," wrote agriculturist L. A. Clinton in 1902, adding: "We believe it was largely due to experiments conducted by this Station that the farmers of the State were induced to undertake the culture of sugar beets."⁹¹ Thereafter the great increase in Cuban sugar, admitted under tariff concessions, combined with the lower cost of producing beet sugar in the West led to its rapid abandonment in New York.† This result could hardly have been anticipated in the 1890's. In abandoning sugar beets, New York farmers were adjusting to national and international conditions entirely beyond their control.

Agricultural research during the decade was marked by a broadening of the lines of investigation, as agricultural science expanded through the experience gained by the researcher and the publication of the results. Two bulletins were prepared on the effect of electric light

*By 1901 the factory in Rome was closed, but one in Lyons, New York, was opened ("The Sugar Beet" [*USDA Farmers' Bull.* 52, Feb. 1899], p. 41; 2d rev. ed. [Sept. 1901], p. 43).

†Cornell's cooperative sugar beet investigations concluded in 1903 ("The Sugar Beet" [*USDA Farmers' Bull.* 52], 3d rev. ed. [Aug., 1908], pp. 43-46).

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on the growth of plants. By 1898 four bulletins had been published on the chrysanthemum, two on the sweet pea, and one on the dahlia. This research was justified by the economic importance of the florist industry in the state. "The chrysanthemum industry in New York State probably involves more capital than the growing of peaches" was the opening sentence of Cornell's fourth bulletin on the chrysanthemum.⁹² The research in floriculture also had implications for the decoration of country homes and was of basic importance in the development of a science of plant breeding. Agricultural chemistry and horticulture were both in the process of division as students delved into various parts of these broad fields and developed these parts into separate disciplines. The ambition and curiosity that motivated the scientist to explore new areas was encouraged by groups of agriculturists in the state — florists, orchardists, dairymen, and others, who anticipated economic applications from this research.* However, this combination of scientific specialization supported by economic interest groups had the unfortunate effect of diverting attention from certain basic problem areas in New York agriculture. In the 1890's New York ranked first in the nation in the production of forage crops, which were vital to the maintenance of the substantial lead New York enjoyed over Wisconsin in the production of dairy products, yet research on the improvement of ensilage, meadows, and pastures received relatively less emphasis as the decade progressed.

Bailey was a student of the history of agriculture and frequently drew on historical sources for theories and observations having relevance to present conditions. In 1733 Jethro Tull had introduced what Bailey called "the first great epoch in the evolution of agriculture" with the publication of his observation that cultivation increases the productivity of plants. By 1890 this observation had been confirmed many times, but Bailey wished to restudy it under controlled conditions. A field of wheat was planted in strips five and one-half feet wide, leaving each alternate strip unplanted but subject to cultivation. The following year the strips were reversed, a procedure which was

*In the case of the poultryman, this relationship had reached the point by 1900 that the legislation appropriating funds for the College of Agriculture stipulated that \$3,000 must be used for work related to poultry and egg production (*Laws of New York, 1900, chs. 418, 419*).

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repeated over four years. The result, as expected, was that the yield from the test area exceeded that of similar fields planted solidly even where manure had been applied. Bailey used this experiment to support his recommendation for the cultivation of orchards—a widely debated subject on which little scientific evidence was then available.⁹³

The farmers' institutes and broader distribution of experiment station bulletins made more farmers aware of Cornell as a center for up-to-date agricultural knowledge. Farmers wrote in increasing numbers, some wishing to know how research methods and results could be applied to their own operations; others, whose knowledge of Cornell was probably recent and certainly vague, asked such questions as: "My ducks are dying. What shall I do?" During the winter of 1894 about fifty letters a day reached Roberts' table. In 1896 nearly eight hundred letters of inquiry concerning insects and insect damage reached the assistant entomologist of the station, M. V. Slingerland. One hundred and twenty-five of the answers were prepared for publication and appeared in the columns of agricultural periodicals.⁹⁴

The cordial relationship with the agricultural press which made this kind of publication possible existed throughout the decade with the *Country Gentleman* and the *Rural New Yorker*. These periodicals published an ever larger number of articles by Roberts, Clinton, and Slingerland. Between June, 1894, and June, 1895, Roberts had twelve articles published in the *Rural New Yorker*; in the same period of 1896-1897 he published twenty-four articles in that paper and four in the *Country Gentleman*. In 1899-1900 the *Country Gentleman* published twenty-four of his articles. During these years L. A. Clinton wrote an even larger number of articles for the *Rural New Yorker*, and Slingerland prepared numerous articles for the same periodical on aspects of economic entomology.⁹⁵

Professor Bailey was most active in publishing books and articles; in fact, he was hardly rivaled in this respect by anyone in the University. The range of interest reflected in his publications is as astonishing as their quantity. Matters relating to plants from theoretical concepts to practical problems of production fell within his professional interest. Notes on *Carex* and theories of plant evolution loom large but no

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larger than pointers for the decoration of home grounds and hints on planting orchards. From June, 1894, to June, 1895, he wrote thirty articles, brought out the third edition of *The Horticulturist's Rule-Book*, contributed over forty articles on plants to *Johnson's Universal Encyclopedia*, of which he was associate editor, and revised and extended Asa Gray's *Field, Forest, and Garden Botany*.⁹⁶

Bailey maintained excellent relations with his publishers. Before 1894 the Rural Publishing Company put nine of his books through the press.⁹⁷ In 1894 Bailey decided to publish with Macmillan, a company with resources for selling a larger volume of his books, including new editions of those previously issued by the Rural Publishing Company. Bailey was able to secure the transfer of these titles to the Macmillan Company without antagonizing the temperamental John J. Dillon, who as president of the Rural Publishing Company controlled its agricultural periodical, the *Rural New Yorker*. "We have no fear," wrote Dillon in 1897, "but that we shall get all the credit that is due to us, and more too, from your hands."⁹⁸

In 1894 Bailey agreed to edit the "Rural Science Series" for Macmillan. This series was planned to sell in a national market, an aim which required studied avoidance of content having only regional interest. In developing this series Bailey corresponded extensively with the leading agricultural scientists in America. The editor that emerges from this correspondence maintained good working relations with his authors while insisting on accuracy, good writing, and a broad point of view.⁹⁹ His editorship of the "Rural Science Series" contributed to a growing national reputation which extended beyond horticulture to all aspects of agricultural education.

By the mid 1890's Bailey was recognized as one of the foremost teachers of horticulture in the country. Graduate students came to him from other states and from foreign countries. These students he organized into an informal group called the Horticulturists Lazy Club. S. W. Fletcher, a graduate student in the late 1890's, recalled that the club was sparked by Bailey and his "genial gardener," Charles Hunn:

The club met every Monday evening in the Forcing House, a small frame structure attached to the greenhouses. After some student had reviewed material in current horticultural periodicals, another would give a talk on horticultural conditions in his native state, be it Oregon, Texas, or Alabama.

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Then Hunn would bring in the refreshments—apples, pears, grapes, cider—and there was badinage back and forth. Professor Bailey was a relaxed and stimulating companion at the Lazy Club.*

When a number of his students had left Cornell to take up positions in other colleges, he organized them into the Cornell Horticultural League to act as a correspondence bureau for the collection of horticultural information from all parts of the country.¹⁰⁰ Bailey's enthusiasm and selflessness made what under other circumstances might seem manipulation entirely acceptable to his students and co-workers. Comradship in the pursuit of knowledge was the basis of Bailey's association with them. It was assumed that each man would contribute what he could, and if Bailey had a flair for organizing people to produce their best effort, so much the better.¹⁰¹ Under his guidance E. G. Lodeman conducted a pioneer investigation on the application of sprays for controlling plant diseases. Originally presented for the M.S. degree, this classic study was published in 1896 under the title *The Spraying of Plants*.† As his former students developed the work in botany and horticulture in other colleges, they sent their students on to Cornell for graduate work with Bailey. "I have a splendid assistant," wrote Fred W. Card of Nebraska, "who wants to come to Cornell for a year as soon as he can see his way to do it." The assistant's name was R. A. Emerson, later head of the Department of Plant Breeding at Cornell.¹⁰² When future agricultural economist George F. Warren was wondering where to go for graduate study, botanist Charles E. Bessy of the University of Nebraska told him to attend Cornell "because that's where Bailey is."¹⁰³

A fascinating and significant aspect of Bailey's character was his attitude toward social organization in America, as this advocate of scientific agriculture accepted to a large extent the values and conclusions of Jeffersonian agrarianism. The country — that scene of

*Fletcher, later a professor at Cornell and dean of the School of Agriculture at Pennsylvania State College, wrote that Bailey was "generally recognized as the foremost teacher in horticulture in the country" (Fletcher to Mrs. Edith M. Fox, c. Oct. 16, 1953). This letter is part of a collection of reminiscences about Bailey by his former students (L. H. Bailey Items).

†New York, 1896. Reprinted ten times by 1913, it remained until the late 1930's one of the few valuable source books on agricultural chemicals. Lodeman's promising career was cut short by his untimely death in 1896.

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the "purer and better life" — he saw being downgraded in American society because the tastes of educated people were being infected by materialism.¹⁰⁴ Country life, he felt, must be preserved as liberty's congenial home, for in its essence agriculture is associated with freedom. The time will never come, said Bailey, when agriculture "shall be governed by a well-defined series of rules and precepts . . . Happily there is one vocation in which men engage which can never be bounded by methods or precedents, one occupation which is as elastic and untrammled and unconventional as the blowing of the wind, the falling of the rain, and the singing of the birds."¹⁰⁵ Like Jefferson, he believed that the solution to whatever agrarian difficulties existed lay in better education. In 1896, in a statement approaching the social-Darwinism of William Graham Sumner, Bailey suggested that the pain arising from "the inexorable struggle for existence" would prepare the normally conservative farmers to receive the "broadening and educative impulse."¹⁰⁶

Professor Comstock, whom L. O. Howard in his history of applied entomology called "the first real teacher of entomology in the United States," was also notably successful in attracting graduate students. Among those who studied with him in the 1890's were Vernon Kellog, later professor of entomology at Stanford University, William A. Riley, later professor of entomology at Cornell (where he was called "Bug" Riley to distinguish him from agricultural engineer Howard W. "Gas Engine" Riley) and E. Porter Felt, for many years state entomologist of New York. Following the example of the graduate students in horticulture, the entomologists organized a graduate student-faculty study club which they named *Jugatae* after a group of Lepidoptera on which Comstock had been doing research. As the decade progressed, Comstock increasingly devoted himself to the noneconomic aspects of entomology, leaving economic entomology to his former student, Assistant Professor Mark Slingerland. According to Howard, Slingerland's publications "soon became models for the on-coming generation of applied entomologists."¹⁰⁷

Unlike Bailey and Comstock, Professor Henry H. Wing had few graduate students in the 1890's, in part because he lacked their national reputation, in part because animal husbandry and dairy industry were as yet too new to the college curriculum to attract many

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disciples. But to a large degree Wing's graduate students made up with quality what they lacked in quantity. Raymond A. Pearson, M.S. '99, was to become the first head of the Department of Dairy Industry at Cornell. Otto F. Hunziker, M.S. '01, acquired an international reputation through his outstanding textbooks, *The Butter Industry* and *Condensed Milk and Milk Powder*.

In the 1890's animal husbandry and dairy industry were at a level of development comparable to horticulture and entomology several decades earlier. Wing laid the basis for further development at Cornell. To dairy industry he contributed several experiment station bulletins on cream separators and the textbook *Milk and Its Products*, which was reprinted ten times before being revised in 1913. In animal nutrition he conducted experiments on the relation of certain feeds to milk and fat production. From these records and those resulting from later studies emerged the systematic testing of cows for milk and fat production—the forerunner to the testing presently conducted by the Dairy Herd Improvement Association.¹⁰⁸ Wing also continued the program Roberts initiated in 1874 for building up the college dairy herd through selective breeding, a method which involved the use of thoroughbred bulls and the rigid selection of the best heifers. The value of this method, which could be duplicated by intelligent farmers, was demonstrated by the increase in production per cow from a little over 3,000 pounds of milk per year in 1874 to over 7,500 pounds in 1897-1898.¹⁰⁹ In 1894 Wing established a precedent for a more structured relationship than had previously existed between the College and agricultural organizations when he instituted advanced registry tests for the Holstein-Friesian Association. The College filled the role of disinterested observer; the milk and butterfat production of cows under test were measured by its employees, who were paid from funds furnished by the Holstein-Friesian Association. By the end of 1894, nineteen other experiment stations had agreed to perform this service for the Holstein-Friesian Association in their areas.¹¹⁰ By providing objective evidence for the superior milk-producing capacity of Holstein cattle, these tests contributed to the rapid expansion of this breed in America.

In 1898 a second state college was established at Cornell through the initiative of state officers without efforts on the part of representa-

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tives of the University. The establishment of the New York State College of Forestry followed Governor Frank Black's recommendation for state-supported experiments in forest culture which would determine the best management practices for the forest resources in the Adirondack area. At issue was the management of the public lands in the Adirondack State Park and surrounding forest preserve and the policy to be adopted toward the extensive private holdings scattered throughout these public lands.¹¹¹ The need for scientific study of forest management was made apparent by the conflicting claims of powerful social groups whose interests ranged from complete prohibition of timber-cutting to open commercial exploitation.

President Schurman's position on the University's relation to the state made it difficult to oppose the Governor's proposal for giving to Cornell University the responsibility for conducting the desired investigations in forestry. By the end of January, 1898, Schurman had decided that the Governor's recommendation seemed desirable.¹¹² In terms of public policy, information on rational forest management in the state was long overdue. The establishment of the State College of Forestry at Cornell enabled the University to extend its curriculum into an area of substantial significance and made possible the enrichment of agricultural education, which had not previously included instruction in the management of the farm timber crop. As early as 1879 Lazenby had insisted that forestry should be a regular part of the curriculum in agriculture. "There are many things taught," he said, "which might be omitted or postponed in favor of this."¹¹³

Unfortunately, the work in forestry began under less than ideal conditions. The College was required by law to operate an experimental forest management area in the Adirondacks which was almost certain to alienate powerful vested interests. This operation was further handicapped by the mistaken belief of state officials that an experimental project could be financially self-sustaining.¹¹⁴ The consequences of these requirements will be seen in the next chapter.

Twenty-five years after Roberts arrived at Cornell, circumstances were favorable for his appearance before the Executive Committee of the trustees to describe the work and indicate the needs of the College of Agriculture; Henry W. Sage had passed from the scene in 1897 and two years later Schurman was away from the University

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serving as president of the Philippine Commission. Roberts' invitation was secured by Acting President T. F. Crane, who had known Roberts in the days when the Agricultural Department was associated with weed-choked fields, a useless barn, a small classroom, and a handful of students. At his appearance before the Executive Committee, Roberts explained the need for additional classrooms and other facilities, which were then more critical than ever before.¹¹⁵ The number of regular and special students had doubled since 1890, and farmers not only sent their sons but sometimes accompanied them to the winter courses. The instruction of graduate students, each working on an individual project, placed even heavier demands on the facilities of the College.

The rapid expansion of the College of Agriculture in the 1890's was aided by an increasing interest in agricultural education throughout the nation. The United States Department of Agriculture, which was raised to cabinet status in 1889, expanded its work during the decade in both research and the extension of agricultural information to the individual farmer. In 1900, \$205,000 in research funds was available to this governmental department in addition to an appropriation of \$950,000 to the Bureau of Animal Industry, part of which was used for research.* By 1900 the department had published 120 farmers' bulletins, many of which were similar to those published by the state experiment stations.

After the passage of the Hatch and the Morrill Acts agricultural education was established on a sound basis in many states, frequently under the leadership of Cornell graduates. In June, 1891, President Adams reported that sixty of the seventy-one graduates of the College of Agriculture were holding "presidencies, professorships, or other positions of collegiate grade."¹¹⁶ In many states the funds available for agricultural education were far greater than those available to Cornell, since, in New York, state support was divided between Cornell and Geneva. However, if these two institutions are considered together, New York's support for agricultural research

**Yearbook of the U.S. Department of Agriculture*, 1900, p. 636. About 22 per cent of the total federal funds available for agricultural research were appropriated for use by the Department of Agriculture.

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and extension was considerably greater than that of other states.* It was in facilities for resident instruction that New York lagged behind. The substantial appropriations for such facilities in California, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio, and Wisconsin provided the principal argument for those advocating increased state aid for agricultural education at Cornell.¹¹⁷

The public's acceptance of agricultural education as a desirable social investment was associated during the decade before 1900 with increasing uniformity of educational methods. Stress on common elements resulted from the growth of the Association of American Agricultural Colleges and Experiment Stations as a medium for the discussion of educational methods and objectives and was also a consequence of the United States Department of Agriculture's becoming an agency for the coordination of agricultural research. As a result of widespread irregularities in the use of Hatch Act funds by the states, Congress, in 1894, made the Office of Experiment Stations responsible for supervising expenditures under the act. This office interpreted its authority broadly. Going beyond the establishment of uniform financial procedures, it recommended the use of sound methods in research and insisted that the projects outlined by each station should be scientific investigations embodying some original features.¹¹⁸ This control was not undesirable when carried out by administrators who used their power wisely. In practice it facilitated the coordination of research at the state stations and promoted the abandonment of practices which could not be defended in terms of their value to education. A similar result followed from the cooperative experiments conducted under contracts between the state experiment stations and divisions of the Department of Agriculture. The price of these additional federal funds, utilized by forty-three states and territories in 1900, was acceptance of the conditions set by the national department.¹¹⁹

The motivation behind this increasing national interest in agricul-

*For agricultural research, New York appropriated about \$99,000 in 1900, or nearly three times that of any other state. The mailing list of the Geneva Station alone was larger than those of other states (*Ann. Rpt. of the Office of Experiment Stations for the Year Ending June 30, 1901*, pp. 214-223).

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tural education was complex. Historical factors, including state and national policies of public aid to agriculture and changing attitudes toward science, were involved. The agricultural depression, which marked much of the 1890's, and the emigration from rural to urban areas attributed to this depression, had its effect. The political successes of the Populist party, with its radical solutions to agrarian difficulties, also called the nation's attention to the plight of the farmer.

That urban areas were increasingly attractive to rural youth was unquestioned, but what could be done to keep young people on the farms was an open question. Roberts recognized that overproduction of agricultural goods combined with increased mechanization in agriculture made the rural exodus inevitable, but he could not accept the loss of the best farm youth to the city. Like Bailey, he saw materialism as the villain, to be destroyed, hopefully, through a reorganization of the value system of the American people. To his colleagues in other agricultural colleges Roberts said, "If, somehow, we could get clear of the grasping, sordid, money-getting spirit which is so prevalent in all America, and learn to prize highly leisure, wisdom, and knowledge, the problem of low prices, overproduction, and exodus from a healthy rural life would be measurably solved." At the same session of the Association of American Agricultural Colleges and Experiment Stations, Dean Eugene Davenport of the University of Illinois, also stressed social values in discussing the rural-urban movement:

I come now to what in my judgment is the most potent influence in draining the best young people from the farm. I refer to that caricature of humanity that passes for a farmer in the pages of current literature. Simple minded, and incidentally honest, uncouth in language and coarse in manner, destitute of everything but good intentions, he is depicted more unfavorably than is positive villainy.¹²⁰

In the late 1890's the new rural free delivery service became an agency for psychological conflict in rural New York as it carried to the farm family periodicals reflecting the superiority of urban life, along with Cornell's extension bulletins designed to improve rural living.

The extension staff at Cornell was dedicated to preserving country life by making it more attractive. It was this dedication to a concept

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far broader than technical agriculture that gave the Cornell extension work its special significance and accounts for the expanding scope of extension from the farmers' institutes of 1890 to the diversified program of 1900. Cornell bulletins in the decade of the 1890's dealt with such diverse aspects of country life as the decoration of home grounds, making the rural school more attractive, artistic design of the outhouse, and, most important, the introduction to nature study for young and old. The four series of extension publications issued in 1900 all emphasized nature study; the farmers' reading course, the home nature study course, the teachers' leaflets, and the junior naturalist leaflets. By this time John W. Spencer had assumed the role of Uncle John to give a personal dimension to the work with the school children. During the 1890's and for the following decade, Bailey and his colleagues received thousands of letters from other states inquiring about nature study education. As developed at Cornell, nature study gave direction to the movement for the introduction of agriculture in the secondary schools and, unlike much other secondary education at the time, had relevance to the lives of the students. The then-dominant cultural epoch theory of education, emphasizing the study of Greek and Latin on the ground that the education of children should parallel the development of man, was not adapted to a society which was becoming more and more oriented to the uses of science. By helping to liberate secondary education from outworn theory, nature study made a lasting contribution to American society. Graduate student M. F. Miller was so impressed with the program that on retiring as dean of the College of Agriculture at the University of Missouri in 1945 he undertook a similar set of nature study bulletins for the young people of that state.¹²¹

Sentiment at the turn of the century favorable to the further development of agricultural education unquestionably aided President Schurman in his efforts to secure further state support for this area of education at Cornell. He had carefully fostered the concept that Cornell's possession of the Morrill land grant made the state responsible for the further development of the University and the establishment of the state-supported Veterinary College and College of Forestry, and the assignment to the Cornell Board of Trustees of responsibility for their administration provided some evidence that

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Cornell's quasi-public status had been recognized by the state. As the decade ended, the state was annually appropriating \$35,000 for extension work in the College of Agriculture and \$10,000 each for the Veterinary College and College of Forestry. However, any attempt by Cornell officials to secure a substantial increase in state support for these or other activities of the University was certain to encounter serious opposition, a situation made evident to President Schurman at the time of his unsuccessful attempt to secure a state-supported teachers college at Cornell.

Unlike the legislation appropriating state funds for constructing buildings for agricultural and veterinary education and initiating the College of Forestry at Cornell, the bill to establish a state teachers college at Cornell lacked the support of the Governor on its introduction in 1896. Moreover, it encountered considerable opposition from colleges and universities in the state which did not concede that possession of the land grant gave Cornell a special basis for claiming state support.¹²² The press also was becoming critical. The *Country Gentleman*, which had long and consistently supported Cornell's handling of agricultural education, reprinted without comment a long article from the Rochester *Union* attacking Schurman's efforts to secure state funds while maintaining private control.¹²³ Overcoming this opposition to further state support required all of President Schurman's reputed capacity for astuteness.

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ROBERTS' CONCLUDING YEARS

IN December, 1901, the issue of state aid to Cornell was reopened by the agricultural press, the immediate objective being a state appropriation to construct the long-contemplated agricultural building. The *Country Gentleman* made the first appeal on December 5, following this on February 6, 1902, by a similar article, which included a picture of a new agricultural building at Iowa State College. The front page of the December 7 issue of the *American Agriculturist*, devoted to praise for Cornell's work in agricultural education, included a description of the cramped conditions under which the faculty worked—the business office of the College of Agriculture, the director's office, the office of the Experiment Station, and the agricultural library were all combined in a single room on the second floor of Morrill Hall. President Schurman had already arranged to pay \$750 for the distribution of 30,000 copies over the state, with the understanding that the *American Agriculturist* would "make appreciative reference to the work of Cornell University."¹ This article, according to the issue of December 21 was "universally approved by the farmers of the state." A picture of a new building at the College of Agriculture at the University of Illinois was included with the announcement that the New York State Dairymen's Association had called on the state to erect the agricultural building at Cornell.²

In 1902 the *Rural New Yorker* joined in emphasizing the state's obligation to Cornell. Early in November, 1902, Editor Herbert W. Collingwood visited the University and had a frank discussion with Schurman. Later Schurman sent him a long statement cast in the form of an interview between himself and Collingwood, which was printed in the November 29 issue of the *Rural New Yorker*. In the statement Schurman referred to his own farm background and paid tribute to

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the farmers as "the backbone of the country, the most conservative class we have, the people of the solidest character." Only at the end of the "interview" did Schurman raise the subject of state aid by attributing to Collingwood the question, "Do you agree with me that the state must make provision for agricultural education?"³

The objective in 1902 was still limited to securing a state appropriation for an agricultural building. In February, 1902, James Rice, who had kept in close touch with developments at the College, wrote to President Schurman in a vein which probably reflected the opinion of the college faculty. The failure of the University properly to support the College, he said, "has gone so far already that a mere statement of good intentions will not suffice. The people will insist upon positive assurance on the part of the University just what they will do for agriculture from the land grant funds before they will ask the state to build proper buildings."⁴ Schurman used Rice's letter as a point of departure for a long address to the faculty and students in the College of Agriculture. Schurman conceded nothing. Raking over his arguments of the last ten years, he neatly avoided the issue of what part of the land-grant income should be devoted to agricultural education.* However, in 1903, the trustees increased from \$5,700 to \$10,000 the allotment to the College of Agriculture from funds received under the Morrill Act of 1890.⁵

Professor Cuthbert W. Pound of the Law School was then Cornell's advisor on legislative matters. In early February, 1902, he prepared a bill for the agricultural building which was introduced by Senator Slater, a Cornellian of the Class of 1894. Schurman thought that the support of farm groups and the agricultural press might make its passage possible, but the legislature adjourned with the bill still in committee.⁶ There was hope for success the following year, however, if the bill could be brought to a vote. Roberts reported in June, 1902, that he had received "personal letters from a majority of the Senators and Assemblymen" which led him to believe that the state would appropriate funds "in the near future" for completing the building started in 1893.⁷

**Cornell Alumni News*, Feb. 26, 1902, p. 143. Schurman added insult to injury by sending Rice six copies of this speech (Schurman to Rice, Feb. 25, 1902, Schurman Papers).

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S. F. Nixon, who had sponsored Cornell's appropriations for agricultural extension, was in a powerful position to aid Cornell. Speaker of the Assembly since 1899, he was a key figure in the dominant Republican party. However, it is fairly evident that Nixon was not satisfied with the extension work of the College of Agriculture as administered by Director Roberts. Nixon's basis for dissatisfaction and the lengths to which Schurman would go to please him are indicated by events in June, 1902.

Nixon was president of the Chautauqua and Erie Grape Company and the owner of large vineyards and orchards in Chautauqua County. On June 6, 1902, he wrote Roberts, asking for aid against the leaf hoppers and rootworms which were plaguing the grape growers in his area. Roberts replied on June 9 that he was dispatching Professors John Craig and Mark Slingerland to Chautauqua County. Meanwhile Nixon had taken up the matter with Professor Pound, who held public office as a member of the State Civil Service Commission. On the morning of June 10, Pound personally communicated Nixon's wishes to Schurman, who that same day wrote a thoroughly patronizing letter to Roberts ordering him to set aside the plans of the extension division and concentrate on the work in Chautauqua County. "I regard the matter as one of the utmost importance," he wrote, "and the successful treatment of it demands and deserves your wisest, promptest, and most absorbing attention." On June 11 Pound sent Nixon a copy of Schurman's order to Roberts, and on the following day Schurman wrote Nixon, expressing regret that "a plague of insects is threatening your grape crop" and enclosing his letter to Roberts "instructing him to throw the entire resources of the Department into the problem." By the end of July, Professor Craig was well on the way to clearing out the leaf hoppers in ten acres of Nixon's vineyard and was pleased that Nixon had turned his apple orchard over to the Station for "a demonstration experiment in cultivation, pruning, and spraying."⁸

Nixon's friend, John W. Spencer, then serving as liaison between Nixon and the College of Agriculture, wanted Roberts to do more demonstration work on Nixon's farm, to be financed from the extension appropriation.⁹ In late August, Roberts visited this farm. Afterward he wrote Nixon making a series of recommendations, none of

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which involved direct assistance from the College of Agriculture. "Never mind," Spencer wrote Nixon, "I will see something is done beginning early another year."¹⁰ By January, 1903, what Spencer termed "an earthquake" was occurring at the College of Agriculture as it became known that Bailey would succeed Roberts as director that summer. Spencer had several talks with Bailey about the extension work and was greatly encouraged. Writing to Nixon, Spencer noted that "Roberts has always cut out your name in connection with this work. This will now be changed. With Bailey I shall have a strong influence in council. I am hoping that in the shuffle I'll have an advance in salary."¹¹

Legislation for an agricultural building was not pushed in the 1903 session of the legislature, probably because Schurman had been forewarned by Governor Odell that other college presidents would oppose further state aid for Cornell. In reporting this information to Collingwood, Schurman professed surprise that any college president would oppose "the legitimate demands of the farmers of the State of New York." One of these presidents, Palmer C. Ricketts of Rensselaer Polytechnic Institute, thought that the demand for state aid emanated from Cornell authorities rather than the farmers. Other colleges, he stated, had an equal claim to the public funds which were being secured by Cornell.¹² The \$101,000,000 appropriation for the Barge Canal was also a factor in the postponement of the agricultural building, for the canal appropriation had priority over other matters. It was late in the session when bills were introduced calling for a state appropriation for an agricultural building, the strategy evidently being to establish a claim which could be pressed in the future.¹³

The increase in enrollment continued, making a new building more urgent each year, as is shown by the number of students in the various courses for the years 1901-1905:¹⁴

<i>Year</i>	<i>Regular</i>	<i>Special</i>	<i>Graduate</i>	<i>Winter</i>
1901-02	49	43	22	96
1902-03	60	53	18	121
1903-04	77	64	21	134
1904-05	98	90	31	199
1905-06	128	102	40	248

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Until the fall term of 1903, the curriculum of the College remained much the same as in the 1890's, with Professors Roberts, Bailey, and Wing carrying the bulk of the teaching load with the aid of Instructor G. N. Lauman. Lauman assisted both Roberts and Bailey, taught agricultural history and the economics of agriculture, and gave two courses in reading technical works in German. Roberts continued the practice of supplementing instruction on technical agriculture with advice concerning personal situations basic to rural life. "A small house makes the family neighborly with themselves," he told his class in 1902. On the subject of visiting—so vital to happiness in rural neighborhoods—he tactfully suggested that "it is a great gift to know how long to call on a person and when to go." Roberts was not without a sense of the dramatic. On the centennial of the Louisiana Purchase he chose to lecture on history rather than horses.¹⁵ Much of the information contained in his lectures appeared in 1900 under the title, *The Farmstead*.

The extension work continued to expand during these years. By 1901 the farmers' reading courses had been organized to provide a three-year home study program. Three series, each containing six lessons, followed in logical order, beginning with the soil and the plant, continuing through livestock feeding, and concluding with orchard care. The winter courses, which had been placed under Professor Craig's direction in 1900, were integrated with the farmers' reading course that they might serve as a culmination to the home study program.¹⁶

In 1900 Anna B. Comstock and John W. Spencer secured a "young woman of broad sympathy and understanding and great capacity for work" to initiate an extension program for women.¹⁷ It was at a typewriter located under the basement stairs of Morrill Hall that Martha Van Rensselaer began a reading course for farmers' wives which evolved into the College of Home Economics at Cornell. Bailey and Spencer had already learned from replies to a circular they had distributed to ascertain the potential readership for such a course that many women were ready to be liberated from a life of "men and mud."¹⁸ Miss Van Rensselaer's first two bulletins, "Saving Steps" and "Home Sanitation" were sent to a list of nearly five thousand women who replied to this circular. "Housekeeping is a fine

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art," declared Miss Van Rensselaer in the second lesson, "and it was never intended that a woman's health and happiness should be sacrificed in doing that which to do well is elevating and essential to the comfort and happiness of the human race."¹⁹ The series soon went beyond household management to consider other aspects of country life ranging from hints on the appreciation of beauty to the significance of the school in the rural community. In 1903, 3,600 new readers were enrolled. Twenty thousand junior naturalists that year enlisted in 600 clubs.²⁰

By itself the experiment station bulletin was not proving an effective agent for agricultural change in the state, for farmers were unwilling or unable to put the recommendations to a practical test. Direct assistance from Cornell staff members in applying agricultural research to the situation of the individual farmer remained as vital as previously.²¹ Roberts continued to emphasize the cooperative experiment, both as a teaching device and as a means for testing results obtained at the Cornell Station under a variety of climatic and soil conditions, but the necessity for frequent supervision placed limits on the number and complexity of these experiments. These limits were widened somewhat in 1903 through the organization of winter course students into the Agricultural Experimenters' League of New York under the direction of John L. Stone. This organization provided a medium for the continuing education of former students, who used the fields of their home farms as laboratories under the direction of Mr. Stone. The organization also served to keep former students in touch with the College of Agriculture.²²

Roberts' retirement in the summer of 1903 marked the end of an era in agricultural education at Cornell. When he came from Iowa in 1874, there were only a few professors of agriculture in the country; when he retired in 1903, the expansion of agricultural knowledge had made professors of agriculture an anachronism. An individual could no longer encompass the knowledge which fell within the science and practice of agriculture. Plants and animals had long been separated as fields of study, and within these broad areas further specialization was occurring. For Roberts, administration had been a job which interfered with his other duties but never prevented him from carrying a full program in resident instruction.

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"As the years have gone by," he wrote Bailey, "the running of the College has become more and more complex and more difficult. I fully discern that it is quite time that the College should enter upon a new life, however good the old one might have been."²³ In the autumn of 1903 the man Bailey called "the wisest farmer whom I have known" left Cornell to live with his children in California.*

SECURING THE NEW YORK STATE COLLEGE OF AGRICULTURE

Bailey's national reputation as an agricultural educator and his familiarity with the Cornell scene made him the obvious choice to succeed Roberts as director of the Experiment Station and dean of the Faculty of Agriculture. He did not want the job but took it, he wrote a friend, because "there are times in a man's life when he must take the things that seem necessary whether they are quite in the line of his desires or not." Some forty years later Bailey told a group of faculty members that he had hoped to go further as a scholar but had reluctantly become dean because of Schurman's urging.²⁴ In 1903 he resigned as editor of *Country Life in America*, a magazine he had been instrumental in founding two years previously, to accept a position where he could more effectively influence the movement for the improvement of country living.²⁵

The most noticeable change that followed Dean Bailey's accession was an expansion of faculty and curriculum greater than had occurred in all previous years combined. Seven new positions of professorial rank were established, six of which were filled by former students of the College. The most important of these was the position, professor of agronomy and manager of the university farms. To fill this, Bailey secured Thomas F. Hunt, then dean of the College of Agriculture and Domestic Science at the Ohio State University.†

*I. P. Roberts, *The Fertility of the Land* (New York, 1897), p. v. The first dean of the College, Professor George C. Caldwell, retired the same year as Roberts. His contacts with the College of Agriculture had become less frequent during the 1890's.

†In this instance Cornell benefited from an ill-considered Ohio law which limited salaries at its State University to \$2,500 (James E. Pollard, *History of Ohio State University* [Columbus, 1952], p. 182).

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Professor Wing's old position was divided, Wing retaining the professorship of animal husbandry, Raymond A. Pearson becoming professor of dairy industry. "I believe you are going to build up the greatest College of Agriculture in our greatest state and I shall be proud to be one of your helpers," wrote Pearson, after rejecting a substantial increase in salary at the Walker-Gordon Company. Professor Craig was transferred to the professorship of horticulture and S. W. Fletcher was made assistant professor of extension teaching in agriculture. In June, Bailey asked James Rice what would be "the very lowest terms" at which he would take over the work in poultry husbandry. In August this veteran of over 1,100 farmers' institutes agreed to take a financial loss in order to "be one of the corps who, working together toward the common end, shall see Cornell occupy in the agricultural world the position of pre-eminence which is hers by right."²⁶ Jay A. Bonsteel was secured as professor of soil investigation through assignment to Cornell by the Bureau of Soils of the Department of Agriculture. John L. Stone was made assistant professor of agronomy and George W. Cavanaugh assistant professor of chemistry in its relation to agriculture. George N. Lauman became instructor in rural economy and secretary of the College.²⁷ The most radical innovation was that of adding Miss Van Rensselaer and Mrs. Comstock to the core of regular teachers; each gave a half-year course in women's activities.²⁸ The principle of coeducation, which had been accepted from the beginning at Cornell, had not previously been extended to the faculty.

Even this expansion did not satisfy Bailey, who saw still other areas of agricultural education which should be developed. In October, 1903, he corresponded with Elwood Mead about the need for irrigation in the East and the relationship between such technical operations and agricultural engineering. On his own responsibility Bailey had just announced some courses in agricultural engineering which, he added, "are wholly inadequate, but they are a beginning." He approached the Secretary of Agriculture, James Wilson, for some help in getting these courses under way, but was told the department had only \$5,000 for farm engineering and was already "under a promise to the Wisconsin people to help them make a start." Bailey also started a class in landscaping, or, to use his phrase, "outdoor art,"

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but by December this had practically ceased to function because of a lack of money. "It is a work that is very much needed and we shall try to make it go if it is a possible thing," he wrote Warren Manning, who wished to assist in the work if he could afford to do so.²⁹

From the beginning Bailey emphasized to student and staff alike the need for personal identification with the advancement of the College. He instituted regular agricultural assemblies which everyone was expected to attend on pain of being counted delinquent by Lauman.³⁰ In 1903 he established a student magazine to which he allotted office space in the lecture room in Morrill Hall. Here office hours were held at noon and late afternoon when the room was not otherwise in use.³¹ Filled at that time largely with articles written by members of the faculty, the *Cornell Countryman* noted new developments in agricultural education and served, through news of the alumni, to keep former students in touch with the College.

In the fall of 1903 the big push to secure the agricultural building was under way with Bailey and Schurman each organizing support for a state appropriation in his own way. There was little advance planning between them; rather what cooperation occurred was in the context of adjustment to new situations as they arose. Each had only a general knowledge of the other's activities. When success finally came, each could claim a major share of the credit on the basis of information available to him.

Bailey concentrated on securing the support of farm groups and other agencies involved in agricultural education. He was fortunate in having good working relations with Whitman H. Jordan, director of the Geneva Station, and F. E. Dawley, director of the Bureau of Farmers' Institutes.* Members of the Cornell faculty continued to lecture at these institutes; over the years, since the policy of encouraging faculty participation was established by President Adams, they had made the work of the College of Agriculture known to thousands of New York State farmers. In the fall of 1903, the institutes took precedence over other educational activities. Faculty members were assigned to institutes directly by Dawley, sometimes to as many as

*Direction of the farmers' institutes was placed under the control of the commissioner of agriculture when the State Department of Agriculture was created in 1893.

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four a week. Dawley was a strong booster of the agricultural building; his support facilitated placing the accomplishments and needs of agricultural education at Cornell directly before the farmers.³² In November and December, 1903, four-day Normal Institutes were held at both Cornell and Geneva in order to acquaint the institute lecturers with information of value to New York farmers.³³

By September, 1903, a Committee for the Promotion of Agriculture was formally organized by officers of the leading farm organizations in New York and of the State Department of Agriculture, editors of the agricultural periodicals published in New York, and Directors Jordan of Geneva and Bailey of Cornell. H. E. Cook, president of the New York State Dairymen's Association, was named chairman.³⁴ This combination of farmers, journalists, and agricultural educators, joined in advancing a common interest, is an indication of how far agricultural education at Cornell had progressed since its uncertain reception by farmers and the agricultural press in the 1870's. In 1904 the president of the Central New York Farmers' Club insisted that Bailey appear and make a rousing speech for state aid to Cornell on the grounds that agriculture had been neglected long enough.³⁵

Early in September the Committee for the Promotion of Agriculture met at Syracuse to consider "ways and means" for securing state aid. In reporting the meeting to Schurman, Bailey said that "a good deal of inquiry" had developed concerning the relation of the University to the state, adding, "It seems there are forces at work to influence public opinion against making an appropriation to what some people think to be a 'private institution.'" The committee realized that arousing farm people would not be sufficient; the Governor and Senator Platt would have to be approached, a task Editor W. G. Johnson of the *American Agriculturist* thought could best be handled by President Schurman. "I was surprised," Bailey concluded, "to find out how ignorant the Committee is of the exact status of Cornell University in respect to the State . . . Many seem to think that if the State is to give money to the College of Agriculture the State must have more direct control in the affairs of the University."³⁶

Between September and December, 1903, the objective gradually shifted from securing a state appropriation for an agricultural build-

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ing to making the College of Agriculture a state institution. On September 9 Bailey wrote to fourteen eastern agricultural colleges asking whether state aid was received on a regular basis.³⁷ During the following three months various strategies for obtaining a state college of agriculture were thoroughly explored, but in early December the matter was still undecided. The initial decision to press for a state college was apparently made by Speaker Nixon and almost certainly involved, as a *quid pro quo*, the extinction of the State College of Forestry. ✓

In May, 1903, Governor Odell had vetoed the annual appropriation for the College of Forestry in response to demands from Adirondack land owners who opposed the clear-cutting policy of Director B. E. Fernow.³⁸ In June, 1903, instruction in the College ceased and the faculty was dismissed. "The veto of the appropriation," Bailey said later, "was a surprise to all of us."³⁹ However, the College of Forestry continued as a legal entity, and the way was left open for the renewal of instruction in the future.* In September, Bailey went directly to Albany from a meeting of the Committee for the Promotion of Agriculture to confer with Speaker Nixon, who asked Bailey to collect statistics on forestry and forestry education and to accompany him on a trip to inspect Cornell's forest lands in the Adirondacks.⁴⁰ In planning his opening address to the Assembly, Nixon asked Bailey about forestry in connection with colleges of agriculture. In the same letter Nixon said, with reference to a state college of agriculture at Cornell, "I think I might as well make the effort to get it."⁴¹ ✓

Schurman still had to be persuaded that it would be wise to unite the instruction in forestry with a college of agriculture. To this end Bailey wrote two long letters, the first on December 17.

You know, of course, what my own attitude is toward this forestry question. I believe that forestry should be a part of the College of Agriculture . . . As a matter of public policy, also, I believe it would be much better

*In his veto message the Governor said: "The operations of the College of Forestry have been subjected to grave criticism, as they have practically denuded the forest lands of the State without compensating benefits. I deem it wise therefore to withhold approval of this item until a more scientific and more reasonable method is pursued in the forestry of the lands now under the control of Cornell University" (Charles Z. Lincoln, ed., *Messages from the Governors*, X [Albany, 1910], 555).

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to have one strong college than two or three relatively weak ones, each asking for a separate fund from the Legislature.

There is another exceedingly important phase to all of this. We are going to ask for the agricultural college building. The maintenance of this building will demand heavy drafts upon the University treasury. In fact, I do not see how the University can maintain it. It will be a difficult thing, I fancy, to get an appropriation within at least three or four years to supplement the regular University funds in maintaining the college. However, the State has committed itself to the maintenance of a College of Forestry. I believe that if the College of Forestry can be combined with the College of Agriculture that the State will find itself in duty bound to aid in maintaining the agricultural building when we get it . . .

Of course I should not expect that if the College of Forestry were combined with the College of Agriculture it should teach only farm forestry.

On the following day, Bailey repeated these arguments and added others.

I hope I do not press this matter merely because I am Director of the College of Agriculture. I believe it is the wisest course in the interest both of public policy and of the University. Last winter at Albany I was confronted by inquiries which indicated that the State would be willing to give to either a College of Forestry or a College of Agriculture, but not to both. The question will always come up when there are two such closely related institutions and one will be set off against the other to the detriment of both . . .

I believe that this handling of the matter could be made an entering wedge for placing the College of Agriculture on a state basis as far as maintenance is concerned.⁴²

The evidence for a political bargain exchanging a college of forestry for a college of agriculture is necessarily circumstantial, for it was not the type of agreement to be made a matter of record. Its existence must be inferred from the correspondence between Nixon and Bailey in December and the events which followed in the legislative session of 1904. In his address to the Assembly on January 6, Nixon used information Bailey had provided. After comparing New York's contribution to its agricultural college with what other states were making he said that this state should establish and maintain a "state agricultural college equal to the best in the Union."⁴³ Forestry, he

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added, "ought to be taught in our College of Agriculture and should be a department in every agricultural college."⁴⁴

In securing special interest legislation, timing is of the utmost importance. For many years Editor Luther Tucker of the *Country Gentleman* had kept close watch on legislative matters from his office in Albany and for several years before 1904 had dampened Roberts' hopes for state aid by indicating that in an unfavorable political situation no amount of effort could accomplish the ends desired. At the beginning of the 1904 session Tucker insisted that this was the year for action; a barrage of letters from farmers directed to the legislature could now prove helpful. Roberts was delighted to hear that prospects were favorable. "It makes my nerves vibrate to even think of it at long range," he wrote from California.⁴⁵

At the beginning of the session a bill appropriating \$250,000 for a state agricultural building at Cornell was introduced in the Senate by E. C. Stewart of Ithaca, and the week following a similar bill was introduced in the Assembly by George Monroe of Dryden. The chairman of the Senate Finance Committee, George Malby, and the chairman of the Assembly Ways and Means Committee, James T. Rogers, a Cornellian of the Class of 1893, were known to favor the proposed legislation.⁴⁶ H. E. Cook, who was busily pushing the bill at farmers' institutes, told Bailey there was little cause for anxiety. Nevertheless, Bailey had prepared carefully to secure a favorable expression of rural opinion through letters to members of the legislature and through statements to be presented at a hearing of the Senate Finance Committee on February 9.⁴⁷

On January 8 and 9 the Agricultural Experimenters' League had an attendance of over 150 at its first annual meeting. Bailey was frank about this organization serving as an agricultural pressure group; he stated its purposes to be cooperative experimentation, the advancement of agricultural education, and the support of appropriate legislation.⁴⁸ The league's president, Harry B. Winters, wrote to college alumni at Bailey's request, urging their support of the pending legislation. Securing attendance at the hearing in Albany was complicated by the cost of travel. Cook was anxious to impress the legislators by having Cornell's case pleaded by working farmers instead of

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the officials of farm organizations who usually attended legislative hearings. "Can't you find men enough among your great correspondence list that will pay their own R.R. if you pay the dinners?" he asked Bailey.⁴⁹ The cost of travel was considered important; by the time the hearing occurred, Bailey had secured funds to reimburse travel expenses.⁵⁰

The political strategy adopted to secure a state college of agriculture resulted in keeping the public uninformed about the true objective during January and February, 1904, for the bills before the legislature provided only for the state's erecting an agricultural building at Cornell. On February 4 a conference of legislative leaders was held when, stated Nixon, "the question of a state agricultural college was taken up and the consideration of it was very favorable."⁵¹ On March 11 Assemblyman Monroe introduced a new bill entitled "An Act to Establish a State College of Agriculture at Cornell University and Making an Appropriation Therefore" and thereafter the bill of Senator Stewart was amended accordingly. Additional changes in the Stewart bill provided for the erection of four buildings instead of the single structure originally intended and the conveyance to the state of the land on which the buildings were to be located.⁵²

Only supporters of the \$250,000 appropriation for an agricultural building at Cornell appeared at the hearings of the Senate Finance Committee held on February 9. However, at a second hearing of this committee, held February 22, Chancellor James R. Day of Syracuse University presented a long statement on behalf of his institution and six other colleges and universities located in New York State. Chancellor Day looked beyond the immediate issue of a \$250,000 state appropriation for Cornell to the relation between Cornell and other colleges in the state. The cast of his argument pointed up fears that, step by step, Cornell would use its land-grant status to become a state-supported institution with a competitive advantage over the other colleges in the state. State aid to Cornell he considered discriminatory. In a declaration similar to those made in 1865 opposing the concentration of the Morrill land grant at a single institution, Chancellor Day insisted that the state "should treat us alike. Either give to all or not to any." As to the constitutional provision prohibiting

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state aid to denominational institutions, he said he did not believe this applied to Syracuse University, for although it was affiliated with the Methodist Church, sectarian instruction was not given there.

The Chancellor's approach to the question of further state aid for agricultural education at Cornell was, as he indicated in his statement to the committee, similar to that with which he and other college presidents successfully checked President Schurman's attempt to secure a state appropriation for a college of education five years previously. However, his argument overlooked the essential difference between the two cases. Several institutions in the state had, in terms of equipment and personnel for a school of education, as good a claim for public support as Cornell. This was not true of agriculture, for in this field Cornell was unique. No other institution in the state had the foundation for developing skilled resident and extension teaching allied with an agricultural experiment station. Chancellor Day evidently recognized this fact when he insisted that what the farmers of the state needed was not a single college of agriculture but a number of local agricultural schools. "The quarter of a million," he insisted, "would start five of these schools." In addition to these arguments, Chancellor Day resurrected the claim that Ezra Cornell had illegally manipulated the land-grant fund and that the university bearing his name had diverted to "general purposes" funds which Congress had intended for agricultural education. Together with the six other college presidents, Day offered as a substitute measure a proposal to establish a commission of five senators to investigate the subject of state aid to the colleges and universities of New York State.⁵³

The situation was further complicated by a bill introduced on February 19 establishing a state college of agriculture at Cobleskill and making an initial appropriation of \$200,000.⁵⁴ At a hearing of the Senate Finance Committee on March 16 about one hundred citizens of Cobleskill, along with President Raymond of Union College, urged the committee to postpone the appropriation for the college of agriculture at Cornell until a commission could consider the merits of a separate agricultural college at Cobleskill. The *Country Gentleman* viewed this testimony, which was repeated in similar form by other

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witnesses, as a deliberate maneuver to delay the appropriation for Cornell.*

It soon became evident that Chancellor Day was enlisting further opposition to the appropriation for Cornell. On March 10 Senator Stewart urged Bailey to stir up "our farmer friends," who had lagged in their appeals and correspondence after the initial wave of enthusiasm. "I find," he said, "that President Day is now working the Methodist preachers throughout the state and letters are being received every day from them." Speaker Nixon saw that "quite a fight" was about to develop but had little doubt that "we will be able to handle this matter so that it will come through all right this winter."⁵⁵

Chancellor Day did not confine his efforts to the Methodist ministers and other college presidents. After the second hearing of the Senate Finance Committee on February 23, he circulated in pamphlet form the same charges that had been refuted by Schurman and Bailey. This was followed on March 10 by another pamphlet containing three pages of rather gross misrepresentations. To counter these charges President Schurman prepared a twenty-four page pamphlet which was published over the name of Professor Bailey, refuting each of Day's charges and concluding that further aid to the Cornell College of Agriculture would be a continuation of state policy long approved by the farmers.⁵⁶

In broadcasting what were essentially irresponsible charges Chancellor Day did agricultural education in New York State a substantial disservice. His recommendation for a commission to consider the state's relation to agricultural and other higher education, which could well have stood on its own merits, was tainted by the nature of the arguments he advanced in its support. If agricultural education in the state was to develop rationally, a plan was needed which would include the proposed introduction of agriculture into the secondary schools, the establishment of separate agricultural schools, and the work in agricultural education already established at Cornell University. Such a study might have prevented the somewhat chaotic devel-

**Country Gentlemen*, March 24, 1904. The *American Agriculturist* report that "over 200 people" appearing in defense of the bill were urged on by the presence of Chancellor Day is in error (*American Agriculturist*, March 26, 1904, p. 382).

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opment of agricultural education that occurred in New York State after 1906.

While Bailey usually appeared as spokesman for the interests of the College of Agriculture, Schurman's contribution to the process of securing additional state support was of comparable importance. Before the legislative session of 1904, Schurman spent several days in Albany as a guest of Governor Odell.⁵⁷ The Governor did not enter into Schurman's plans, however, with the enthusiasm Governor Flower displayed in 1893. In his annual message to the legislature, Odell recommended "adequate provision" for agricultural education without suggesting specifically how this should be accomplished.⁵⁸ Schurman's efforts were complicated by animosity between the Governor and Speaker Nixon. When the session opened, these two most powerful men in the state government were at loggerheads over the proposal to concentrate authority over the state's educational system in the Board of Regents.⁵⁹ In early February the Speaker indicated to Bailey the relationship between the bill unifying state authority over education under the Board of Regents and that involving the College of Agriculture at Cornell:

Many of us are desirous that President Schurman should come here at the meeting on Tuesday next of the two educational committees, who are to have a meeting on the unification bill . . . It would be a good opportunity for him also to see some of the fellows with reference to the college. I wish that you would say for me to him that I think it will be of material benefit to Cornell if he will come here to this meeting expressing his views with reference to the unification bill, which we understand are favorable.⁶⁰

President Schurman testified at the meeting as Nixon requested.⁶¹ In March, Schurman was working with Editor W. G. Johnson of the *American Agriculturist* to secure Democratic support in the Senate, for the political division there was sufficiently close to jeopardize the bill if the Democrats made opposition to it a party measure.⁶² Some Democrats did vote for the bill, which passed the Senate on April 8 by a vote of thirty-three to thirteen, having already passed the Assembly by a vote of eighty-seven to forty-five. Immediately thereafter Johnson took specific credit for securing the support of Senator McCarren and his Democratic colleagues from Brooklyn.⁶³ Late in

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March, Schurman prepared the pamphlet over Bailey's name refuting the charges of Chancellor Day, which Bailey later called "the turning point in the great contest for the life of the College of Agriculture."⁶⁴ After the bill passed the Senate, Schurman wrote former President White that he was "continuing to bring influence to bear upon the Governor" who reportedly had become alarmed by Chancellor Day's threats to stir up the Methodists against the Republican party if the bill was signed.*

The Governor postponed his decision until a hearing could be held late in April. The only opposition at this hearing came from the Presidents of Union College and Colgate University who argued that the state should not provide further aid to Cornell until the matter had been studied by a commission. Chancellor Day was not present.⁶⁵ After the hearing the Faculty of Agriculture took preliminary steps toward celebrating the anticipated victory. Arrangements were made with the superintendent of the Ithaca pumping station to blow five blasts on the whistle if the bill were signed, three blasts if vetoed.⁶⁶

News of the Governor's signature reached Ithaca about seven o'clock on the evening of May 9. As the whistle signaled the establishment of the state agricultural college, the agricultural students rushed to the Armory to carry out a prearranged plan to fire a cannon salute to the Governor. Soon about 1,200 students gathered. Led by a large black bull from the university farm, they marched to the homes of President Schurman and Professor Bailey. A college holiday was declared for May 12, and a bigger celebration was planned for the evening of that day.⁶⁷

This celebration began at 6:45 P.M. with a prolonged blowing of whistles and ringing of church bells, followed by a parade of floats that represented the various activities in the College of Agriculture. This in turn was followed by a huge bonfire on the Library slope — the largest ever seen in Ithaca said C. S. Wilson in the *Cornell Countryman*. At about 9 P.M. the members of the College of Agricul-

*April 13, 1904. Schurman's statement in the letter — "the facts that I have just mentioned confidentially to you are unknown to the workers in the cause" — points up the lack of coordination between Schurman and Bailey.

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ture and their guests gathered at the Armory for a banquet prepared entirely from produce from the university farm. H. E. Cook served as toastmaster. At the close of the banquet, Director Bailey was presented with a loving cup. From California came a telegram from Dean Roberts: "Cornell I Yell Cornell I Yell Yell Yell Agriculture."⁶⁸

When calm returned to the campus, the question remained: who had secured the State College of Agriculture? Editor W. G. Johnson had already claimed credit for initiating the campaign and suggesting the successful strategy. "I know from members of the legislature that your words had great weight with that body," Schurman wrote to Editor Collingwood. The *Cornell Alumni News* credited H. E. Cook with doing "more than any other man in creating the sentiment which resulted in the passage of the bill." Bailey was active in organizing support, both within and outside the legislature.⁶⁹

Schurman claimed substantial credit in his annual report for 1904. Quoting at length from his inaugural address of 1892, he represented the recent legislation as a logical outcome to a relationship the state had recognized with the establishment of the New York State Veterinary College.⁷⁰ Schurman's claim was well grounded as far as establishment of a precedent was concerned — and the precedent was important — but it overlooked basic differences in the total complex from which the two state colleges developed. The veterinary college measure enjoyed the support of the Governor, and in terms of cost to the state was a relatively small item compared to the agricultural college. The establishment of a state veterinary college was not opposed by powerful interest groups; only a single member of the legislature then felt it necessary to vote in opposition.

Ultimately, it was the organized farmers of New York who secured the State College of Agriculture. Of course, some of this organizing was the work of Schurman, Bailey, and members of the Cornell faculty who were anxious to obtain greater financial support for the work in agricultural education. The farmers, however, were not passive puppets manipulated from Ithaca, but concerned citizens who accepted the help of Cornell officers in advancing their own interests. This recognition by New York farmers that further public aid to the College of Agriculture was indeed in their interest reflected an awareness of the help the College had given them over a period of thirty

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years. In creating the favorable rural opinion essential to the success of the campaign of 1903-1904, W. R. Lazenby and President Adams made contributions perhaps no less important than their successors. Conditions outside New York also favored a movement for greater public aid to agricultural education within the state. That other states were more adequately supporting their agricultural colleges was constantly held before New York farmers.

It was this widespread interest that made possible on the national scene a successful campaign for greater federal support of the agricultural experiment stations. In 1902 the Association of American Agricultural Colleges and Experiment Stations approved a resolution introduced by Dean Davenport of Illinois calling upon Congress to double the amount of federal money available to each state under the Hatch Act.⁷¹ Late in 1903 this objective was undertaken by Congressman Henry C. Adams at the urging of his friend, Dean W. A. Henry of Wisconsin.⁷² Unlike Congressman Hatch, who did little more than sponsor legislation prepared by a committee representing the state agricultural colleges, Adams gave considerable personal attention to winning his legislation, including spending the Christmas vacation of 1904 in Washington to urge Speaker Joseph Cannon to permit his bill to come before the House of Representatives.⁷³ Through correspondence with the officers of the state experiment stations, the specific content of the bill had been worked out and support organized. Bailey, who was near the center of this communication network, knew something of the complex motivations involved in support of this legislation.⁷⁴ In January, 1904, Dean Henry indicated to Bailey his fear of the expanding federal Department of Agriculture, a fear which Bailey shared during his tenure as director.

*Remember if we do not get this money from the government, the Department of Agriculture will get it, for the Government is ready to help agriculture. In the last two years the income of the Department has grown about \$800,000. There will be a further increase of several hundred thousand dollars in the present session probably. The Department is hiring away many of the good men from the colleges and stations . . . It is a fight for life with the Experiment Stations. If we allow this to go on . . . the U. S. Department of Agriculture will compete with the experiment stations in their own territories.*⁷⁵

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BAILEY AS ADMINISTRATOR

In his administration of the College of Agriculture, Bailey continued an important arrangement which had prevailed under Roberts. Professor Hunt, who succeeded to many of Roberts' responsibilities, was made virtually a vice-director, with control over all expenditures in the associated Departments of Agronomy, Animal Husbandry, and Dairy Industry, as well as those of the university farm.* In another area, the use of college income, Bailey tried to institute a different procedure. Under the old system, which required the deposit of farm receipts in the university treasury, a method of barter had developed in the operation of the farm so that all receipts did not appear on the financial records. The best solution to this abuse, Bailey assured Schurman, would be the automatic reappropriation of farm income.⁷⁶

In his early years as director, Bailey favored the complete separation of experiment station work, resident teaching, and extension. In 1905 he offered the position of vice-director of extension to Kenyon L. Butterfield and a year later informed him that if the extension work were not yet entirely separate, the College was "gradually approaching that goal."[†] Members of the faculty paid by federal experiment station funds were not required to teach or do institute work; persons not paid from federal funds were not required to publish.⁷⁷ Had Butterfield accepted Bailey's offer in 1905, the history of the College might be quite different, for the separation of college functions under the administration of vice-directors would almost certainly have conflicted with Bailey's policy of making the department head completely responsible for the operation of his department, which, of course, usually included resident teaching, extension, and research functions.

Much of Bailey's success as director of the College of Agriculture stemmed from an abundance of energy sufficient for the needs of several normal men. During his tenure at Cornell, Bailey continued to write about one book a year, edit numerous others, and bring to publication his four-volume *Cyclopedia of American Agriculture*. He

*Bailey to Hunt, Oct. 27, 1903, Bailey Papers. Animal Husbandry included the sub-department of Poultry Husbandry.

†Bailey to Butterfield, Aug. 29, Oct. 5, 1905, Dec. 5, 1906, Bailey Papers. In 1905 Butterfield was President of Rhode Island State College, in 1906 President of Massachusetts Agricultural College.

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was constantly collecting information to determine how his College of Agriculture compared with similar institutions and how New York State agriculture compared with that of other states. In December, 1903, he suggested a "wake-up" session to W. C. Barry to determine how New York State fruitgrowing compared with other areas. Nine other fruitgrowers were asked if New York was holding its own. Bailey constantly received requests for speeches from all parts of the country. "It is not too much to say," asserted Dean Davenport when asking Bailey to give a major address at the installation of the new president of the University of Illinois, "that we look upon you as the foremost exponent of sound doctrine in agricultural education." By the fall of 1903 he had already addressed the New York Farmers — a group of prominent New York City businessmen interested in agriculture — on several occasions.⁷⁸

Fame had its complications. Every year Bailey received hundreds of requests for personal advice on a wide range of subjects. He answered each at length, trying conscientiously to meet the problems raised by the correspondent. When the President of Illinois College asked how to offer agricultural instruction on a limited budget, Bailey offered to stop off on one of his trips west and give him some specific advice.⁷⁹ He was actively involved in civic improvement in Ithaca, his opinion being sought as a matter of course in questions relating to the preservation of the natural beauty of the Ithaca area.⁸⁰ With all these activities he still found time to cheer up his colleagues. One day when feeling especially depressed, Professor Fletcher went into Bailey's office and came out feeling more optimistic than he had for some time. "The unfailing optimism of that man is a perennial inspiration to me," he remarked after the session.⁸¹ No matter how busy with speaking, writing, or administration, Bailey tried to reserve Sunday evening for informal sessions at his home with small groups of students. Following the practice of Theophilus C. Abbot, President of Michigan Agricultural College when he was a student, Bailey read poetry and other literature, sometimes of his own composition. He looked forward to these sessions, saying that they helped to keep him young.⁸²

Bailey also found time to carry on two sets of correspondence. That associated with his roles of dean and director was prepared at the

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College; that associated with his roles of publicist and lobbyist was conducted from his residence. The "outside" correspondence was substantial during periods when he was mobilizing the support of groups and individuals.⁸³

Bailey's evident abilities, industry, and national reputation brought him offers of other administrative positions. In 1905 he was offered the post of dean of the College of Agriculture at the University of California. The following year he was approached about the presidency of the Massachusetts Agricultural College with every indication of his election. Bailey was not interested in other administrative positions, but sometimes used these offers to advance the interests of the College of Agriculture. After the California offer H. E. Cook promised to do all he could to promote agricultural education at Cornell. George Malby, chairman of the Senate Finance Committee, made the same commitment. Bailey's place, they assured him, was here in New York.⁸⁴

The combination of roles which Bailey occupied gave him considerable power to influence decisions in organizations connected with agricultural education. His support was frequently sought by persons seeking influential positions in these organizations. Bailey used his power wisely, refusing to give any statement which might be used to embarrass him later. To do so, he usually pointed out in his replies, would be inappropriate for one in his official position. He rarely broke this rule and, when on one occasion he did so, he had to backtrack.⁸⁵

Bailey used his power effectively in advancing his conception of the College of Agriculture, but in his first major decision after the State College was established he was defeated by superior authority. He planned to locate the new buildings along East Avenue in front of the Veterinary College in order to promote the unification of the two colleges. However, this site was not approved by the state architect, who, after looking over the ground, was completely convinced that the knoll where Roberts Hall now stands would be the ideal site for the buildings he envisioned. Furthermore, the Board of Trustees was unwilling to demolish two faculty homes which stood in front of the Veterinary College.⁸⁶ In view of the great expansion of the College since 1904 it is well that Bailey's location was rejected. When the ground-breaking ceremony occurred on May 1, 1905, he was recon-

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ciled to the selected location. After former President White turned the first shovelful, Bailey seized the plow and, together with the students who pulled it, turned out the first furrow.⁸⁷

With the State College established and the buildings under way, the next step — certainly of equal importance — was getting an administration act through the legislature. The administration law for the New York State College of Agriculture at Cornell University, as the institution was therein designated, was everything that the Cornell authorities desired. Recognizing existing relationships, it vested complete control of the College in Cornell University. The requirements for an annual report and approval of vouchers by the commissioner of agriculture were continued from the Nixon laws and the provision that college income be applied to current expenses was already in effect where this income resulted from operations financed by the state.⁸⁸ Bailey had been instrumental in securing this legislation and was duly praised by the Governor's counsel, Cuthbert W. Pound, who evidently considered Bailey's methods well adapted to the legislative process in a democratic society. "Personally, I want you to know that I appreciate what your tact and sound judgment have accomplished thus far this winter. There has been no strife, no newspaper discussion, no public hearings, but everything has been done regularly and in order."⁸⁹

More than two years were required to complete the buildings started on that first of May, 1905. During that time Bailey continued to expand the work of the College, adding at least one new subject to the curriculum each year. In 1905 a course in rural sociology was announced along with a two-year program in outdoor art and a two-year terminal program in nature study for those desiring to teach the subject in secondary schools.* The following year a course in field engineering was given by Professor Hunt, and in 1906-07 courses in agricultural botany and plant diseases were announced over the name of Assistant Professor Herbert H. Whetzel.⁹⁰ The extension work of the College was also expanded. In April, 1904, a new type of publication called the "press bulletin" was initiated to meet the need for concise up-to-date information on problems of immediate concern to

*The term "rural sociology" was continued to 1908, when it was dropped from the *Register* in favor of "rural social organization."

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farmers.⁹¹ Seeking a larger audience for the reading courses, Bailey asked the lecturer of the State Grange to recommend them to the subordinate Granges.⁹² By 1905 additional reading courses on poultry and dairying had been added for farmers and courses on the farm family and food and sanitation for farm women. The latter furnished a basic program for women's study clubs, which sometimes went beyond the lessons to such diverse activities as pronunciation drill and the study of Shakespeare.⁹³

In some cases this policy of expansion was resisted by persons who saw in the new activities a threat to their own sphere of action. The course in agricultural botany was opposed by the head of the University's Department of Botany while the course in field engineering was readily accepted, for this was a new academic area as yet unoccupied by other educators.⁹⁴ Much more serious, however, was the opposition of the agricultural press to Cornell's extension publications.

In the fall of 1903 Bailey's relations with Gilbert Tucker were so cordial that Tucker asked him to prepare an editorial on the needs of the College which would be printed in the *Country Gentleman* as the work of the editor. Yet four months later Tucker was suggesting a price for further support of the College. "Would you be willing," he asked, "to drop your correspondence schools and general circulation of general rural matter that floods the farmer at no cost, if by so doing you could effectively aid in securing your appropriation and further fostering of your interests year after year by the state?" In 1906 the publishers of the *American Agriculturist* joined Tucker in opposing the continuation of the Cornell reading courses. Early that year representatives of the agricultural papers circulating in New York State held a meeting in New York City, which Bailey attended, and, according to W. G. Johnson, they there "inferred" that he "intended to discontinue the publication of the circulars and drop the reading course business." The holding of this meeting is a measure of how damaging the agricultural press regarded the Cornell publications. Ordinarily these editors were too busy fighting each other to join together against a common danger. Dozens of letters in Bailey's correspondence complain of preferential treatment accorded their competitors; the columns of these publications were frequently used for attacks on the motives and good judgment of fellow editors.⁹⁵

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It was President Schurman who decided that no new reading course bulletins would be issued; instead, four-page supplements to previous bulletins were released as a means of retaining the mailing privileges.⁹⁶ In 1907 Tucker followed up this success with a complaint about the out-of-town advertising in the *Cornell Countryman*. Schurman promised to try to restrict this student publication to Ithaca advertising, but Bailey was unwilling to adopt this restriction. The student publications at eleven other agricultural colleges, he pointed out, all took out-of-town advertising.⁹⁷

In 1907 Bailey was anxious to expand the reading courses. "Instead of having 25,000 persons reading," he wrote Schurman, "we ought to have at least 100,000. A small additional increase in funds will enable us to do it." Miss Van Rensselaer and Charles Tuck, who succeeded Professor Fletcher in 1906, were equally anxious to expand the work. Tuck sought the opinion of key members of the legislature and officers of the State Grange. Their replies were encouraging. Continue publications on the broadest basis, they said, and do not be intimidated by the agricultural publications. With these assurances of support, Bailey was prepared to approach President Schurman for a change in policy.⁹⁸

The kind of disagreement between the President of the University and the Director of the College of Agriculture that occurred over the reading courses existed in other areas of college administration; indeed, such differences were almost inevitable between a strong president and a director who insisted that the attainment of his broad objectives required the use of broad authority. The consequences that followed from the conflicting interpretation of their roles were accentuated by differences in personality. The generally able and aggressive President Schurman was often rather cavalier with his equally able and aggressive associate.

By March, 1906, friction had developed over the date the College would vacate the old dairy building which was to form the north wing of Goldwin Smith Hall.* Delay in the completion of this much needed center for the College of Arts and Sciences was threatened by

*The law establishing the state college provided that when the University paid \$40,000 toward the cost of a new dairy building, it could take over the old structure (*Laws of New York, 1904, ch. 656*).

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Bailey's desire to avoid any interruption in the dairy course work. Schurman's insistence that the dairy work move to a temporary location was in accord with his role as university president, for Goldwin Smith Hall would provide office and classroom space for many faculty members then working under cramped circumstances.⁹⁹ An incident of a more personal nature occurred in November of that year. San Jose scale was at that time a most serious pest in New York orchards and had, to some extent, invaded the grounds of the Department of Horticulture. Without consulting Director Bailey, who was presumably aware of its presence, the trustees determined to have it eradicated. President Schurman then wrote Bailey in the peremptory style he had employed with Roberts in 1902:

Accordingly I have to request that you, as Director of the College of Agriculture, will see that these grounds are cleaned up and that this extermination is affected. My own feeling is that no investigation work, no extension work in other parts of the state, and perhaps even no instruction to students has such a primary and emphatic claim upon us as the maintenance and proper condition of our own horticultural establishment.¹⁰⁰

Another message of four days later could hardly have been better calculated to aggravate the situation. In 1906 Bailey had secured a state appropriation of \$100,000 for the operation and maintenance of the College, but this amount was insufficient to support adequately the activities Bailey had initiated. He wished to secure a substantial increase in 1907, in part to compensate the men who had come to Cornell at reduced salaries. Schurman, however, thought no additional state money should be requested:

In any event the matter must be settled by the Board of Trustees of Cornell University, who are responsible for the administration of the State College of Agriculture; and I need not say to you that nothing should be done by you in the way of attempting to secure additional appropriations until the Trustees have decided that additional appropriations are necessary and expedient for the best interests of the College.¹⁰¹

Their subsequent correspondence on the subject deals not only with Bailey's justification for larger appropriations but indicates something of how appropriations were secured at the time. Late in December, 1906, Bailey reminded the President that it was time to

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make a "definite move" to place the needs of the College before the legislature. "I wish therefore," he said, "that you would authorize me, as you have done in the past, to organize the affairs at Albany for the purpose of securing additional funds for our work." In January he wrote a fourteen-page letter to Schurman stating the needs of the College. If these needs are great, said Bailey, the tasks at hand are even greater. Technical agriculture was only a step toward the reorganization of rural society which he envisioned. By itself technical agriculture was not enough; it must be applied to social and economic ends. "There is *not one* institution now existing in the country from school to church and grange, and even to habit of mind, that does not need redirection . . . The kind of work this college ought to do is really undreamed of." By February 2, Schurman had not yet authorized him to arrange matters at Albany. Again Bailey asked permission to proceed, stating that if a "considerable additional sum" was to be requested "we should have our friends informed in case their help is needed."¹⁰² Although Bailey eventually persuaded Schurman and the trustees that additional appropriations should be requested, his way had not been easy.*

In 1907 the Association of American Agricultural Colleges and Experiment Stations, working with the Assistant Secretary of Agriculture, W. M. Hays, secured the passage of the Nelson Act which provided further federal aid to the land-grant colleges.¹⁰³ Bailey had taken an active part in getting favorable action on this legislation.¹⁰⁴ Since the Nelson Act had been conceived and fostered by agricultural college interests, he argued, the entire proceeds coming to Cornell University under the act should be allocated to the College of Agriculture. Schurman did not contest Bailey's explanation of the law's origins but pointed out that he must follow the wording of the law which, in its final form, designated the land-grant institutions as beneficiaries.¹⁰⁵ Eventually the trustees assigned two-fifths of the Nelson fund to the College of Agriculture.¹⁰⁶

Bailey and Schurman also differed on who should act as spokesman for the University in its relations with the agricultural organizations of the state. In 1904 the New York State Committee for the Promotion

*The 1907 appropriation for operation and maintenance was increased 50 per cent over the previous year (*Laws of New York, 1907, ch. 577*).

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of Agricultural Education and Research was organized as a permanent medium for communication between the University and the thirteen member organizations after the University agreed to pay the expenses incurred on an annual visit to Cornell.* In September, 1905, the committee, under the chairmanship of H. E. Cook, held its meeting in Bailey's office. The delegates, who regarded Bailey as the representative of Cornell University, became accustomed to leaving after their annual visit without seeing President Schurman. In 1907 the President made it clear that this practice should not continue. In three letters on the subject Schurman made his position perfectly evident. "In future years," he wrote Bailey, "you will make a conference with the President a part of their visit."¹⁰⁷

Schurman was a complex person. There was another side to his personality which could hardly have left Bailey unaffected. This aspect of Schurman was noted by Anna B. Comstock, who knew him during all his years at Cornell: "He was a man who, as a Professor and President of Cornell, walked alone, for he had no intimate friends; but when sorrow came to members of the University Faculty, he was full of genuine sympathy. Through this, many learned to love him."¹⁰⁸ In 1907 Schurman appointed to an instructorship a graduate student in the College of Agriculture who had lost his wife and had two children to support. "It is awfully pathetic," he wrote Bailey. Among all the President's letters to Bailey, it is one of the few signed "sincerely yours."¹⁰⁹

The relationships of the College with New York farm organizations were generally cordial. Members of the faculty participated in the activities of these groups, and Bailey made Professor Tuck specifically responsible for keeping the College in constant touch with their affairs.¹¹⁰ Throughout the decade the State Grange was especially active in supporting the College. In 1904, when the issue of greatly expanded state support was before the legislature, the Grange established four winter course scholarships in the College of Agriculture.¹¹¹ In 1907 the Master of the State Grange offered to help the

*Bailey to Schurman, Nov. 14, 1907, Bailey Papers. Schurman announced the plan to pay the expenses of delegates shortly before the Governor's hearing in 1904 dealing with the establishment of the state college (*Country Gentleman*, May 5, 1904, p. 529).

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College "in any way within my power," adding that he would see anyone in Albany whom Bailey might wish.¹¹²

If Bailey were to redirect rural life in New York it was necessary for him to coordinate and, to an extent, control the development of agricultural education in the state. A good working relationship with Geneva was vital, for Director Jordan was a powerful and respected figure in New York agriculture who could advance or disrupt Bailey's plans. Fortunately, there was no break in the cooperation between Cornell and Geneva during Jordan's long administration. He admired Bailey as an educator and generally shared his social philosophy; together with Bailey he deserves credit for contributing to the development of agricultural education in New York. In 1906 Bailey and Jordan were drawn together in the Committee for the Promotion of Agricultural Education and Research. Both agreed that this was the proper medium for the development of broad-scale agricultural policy and the agency through which agriculture should "make itself felt" in the legislature.¹¹³ In that year the Agricultural Experimenters' League was extended to include members of the Geneva staff, who could thereafter participate in the cooperative experiments of the organization.¹¹⁴ Several situations tending to produce discord between the institutions were successfully neutralized.* In 1909 the Jordans held a reception for the College of Agriculture faculty which was attended by some fifty members and their wives.¹¹⁵

Bailey was pleased with this good relationship but feared it would not continue unless a "more organized" plan was worked out. Forces were already active which he thought would eventually force the institutions apart. Such forces, of course, had existed since the two stations were established, but were likely to be accentuated by competition for state funds. Bailey, however, may have been reacting less to perceived conditions than to attacks on his motives. "It has seemed too bad," he said, "that I have been obliged to waste some of my energy in merely explaining that I have no desire to 'control things' but rather to help things on toward progressive rural movement."¹¹⁶

*These involved the relative allocation of state funds between the stations (*Country Gentleman*, Jan. 31, 1907, p. 108; Bailey to Jordan, Feb. 4, 1907, Jordan to Bailey, April 6, 1906, Bailey Papers).

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The planned reorganization of rural life which Bailey proposed was complicated by the proliferation of institutions involved in agricultural education. During the decade 1900-1910 New York was swept by a national movement for the introduction of agriculture into the secondary schools. The time lag between the first agricultural schools in California and Wisconsin and the establishment of similar institutions in other states was slight. There was no opportunity to evaluate the success of the first agricultural instruction at the secondary level. By the time the first schools were well under way, over twenty other states and territories had established separate agricultural schools or had introduced agriculture into the secondary school curriculum.¹¹⁷

Speaker Nixon prepared the way for such schools in New York in his opening address to the Assembly in 1905. Refurbishing the arguments he had used previously to justify increased state support for the College of Agriculture, he pointed out what other states and European countries were doing in the area of secondary agricultural education.¹¹⁸ Assemblyman Edwin Merritt, who had consistently supported the expansion of the College of Agriculture, was anxious to establish an agricultural school in St. Lawrence County. He asked Bailey's advice. If Bailey opposed the school, he said he would not move forward but if Bailey were favorable he would "feel more courage."¹¹⁹ Bailey supported Merritt's proposal.¹²⁰ In 1906 the state appropriated \$80,000 to establish an agricultural school at Canton in connection with St. Lawrence University.* Meanwhile, Bailey learned that President Boothe C. Davis of Alfred University intended to press for a similar arrangement for his institution. Early in 1908 a group of Morrisville boosters sought Bailey's support in converting the former county buildings into a state school of agriculture.¹²¹ Bailey supported legislation for establishing an agricultural school in both of these locations.†

Unlike the first school at Canton, these later institutions were coor-

**Laws of New York*, 1906, ch. 682. This legislation provided broad authority to carry out work in resident instruction, research, and extension, the latter to be conducted "so far as practicable in harmony with the college of agriculture at Cornell University."

†William W. Armstrong to Bailey, Jan. 4, 1908, Bailey Papers. A building at the Morrisville school carries Bailey's name.

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dinated with Cornell and other agricultural interests by a provision in their enabling legislation making the director of the College of Agriculture, the commissioner of agriculture, and a representative of the State Grange ex officio trustees.* Before these institutions opened, the school at St. Lawrence had already entered a period of trial. Its first dean, K. C. Davis, called it a failure and urged Bailey to oppose the establishment of additional agricultural schools in connection with institutions which were only interested in getting state money.¹²² However, the position of this school improved in 1908 when H. E. Cook replaced Davis as dean.† Cook had the confidence of farmers in the northern part of the state and enjoyed the additional advantage of close contact with sources of political power. At the end of 1908 Bailey was in a position to coordinate the work of these schools with that of the College of Agriculture through a combination of personal relationships and his role as ex officio trustee.

The introduction of agriculture in the public schools posed quite a different problem, since it fell within the authority of a powerful existing agency—the State Education Department. In 1905 the department had a representative at farmers' institutes to promote the introduction of agriculture in the rural schools. In 1906 the department allowed agriculture as a possible high school subject, and nature study and agriculture as optional elementary school subjects. The assistant commissioner of education, Augustus S. Downing, was interested in promoting the work but was unwilling to proceed at the pace Bailey desired. There was, he thought, considerable opposition around the state to the introduction of agriculture in the secondary schools. The same was true concerning the introduction of agriculture into the normal schools. Bailey pointed to the successful experience

**Laws of New York*, 1908, chs. 200, 201. In the case of Morrisville, one of the five trustees appointed by the Governor was to be recommended by the Grange. This school was to give courses preparatory to the more advanced courses at Cornell.

†Cook to Bailey, April 27, 1908, Bailey Papers. At this time the law establishing the school at St. Lawrence University was amended to restrict its functions. The words "throughout the state" were dropped from the passage on extension and the authorization for work in resident instruction was qualified by the phrase "elementary and practical" (*Laws of New York*, 1908, ch. 202).

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in Wisconsin; Downing replied that this state was not yet ready and to proceed faster would invite press opposition to "fads." Bailey was even less successful with another assistant commissioner of education, E. J. Goodwin, with whom he was trying to arrive at a satisfactory syllabus for high school agriculture. Commissioner Goodwin regarded Bailey's syllabus as excessively flexible and lacking "definiteness." Since Bailey was not accustomed to having his ideas on agricultural education rejected, Goodwin did well to conclude his letter of June 9 with the hope that "this unfavorable judgement may not displease or dishearten you."¹²³

Bailey was himself under pressure from the federal commissioner of education, Elmer E. Brown, who was urging him to use the Nelson Act fund to form an organization for training elementary and secondary school teachers of agriculture. Bailey agreed that the time was ripe and that Cornell should surely act, "since we have been the first to take up this line of work in the schools and have pushed it hardest and the farthest."¹²⁴ By 1907 Cornell had a substantial base on which to build. The number of junior naturalist leaflets distributed each school month had grown from 18,000 in 1902 to 37,000 at the end of 1907. The work with children had been expanded to include school grounds and gardens. In the spring of 1902 alone about 2,600 children wrote about their improvements to the grounds of 427 schools. By 1907 students in the two-year nature study course were practicing teaching in the Ithaca schools, and Anna B. Comstock was teaching a three-week course in nature study for New York schoolteachers each summer at Chautauqua.¹²⁵

While the work in secondary agriculture developed more slowly than Bailey desired, it did not suffer the difficulties of his school for highway commissioners. The proposal for this school developed out of a three-way correspondence between Senator George Malby, Bailey, and Utica lawyer W. Pierrepont White, who more than any other person was the father of the good-roads movement in New York State.¹²⁶ The suggestion that the College of Agriculture should be training the town highway commissioners in road construction and maintenance came from White. Bailey was at first inclined to justify the existing method of road management—planning, construction, and maintenance by untrained men, usually local farmers — but

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quickly recognized the validity of White's argument that the increased agricultural production advocated by the College would result in rural bankruptcy without better roads. Senator Malby feared that Chancellor Day would take up the instruction of highway commissioners unless Cornell acted quickly.¹²⁷ Once convinced, Bailey acted with characteristic energy. He contacted Editors Collingwood and Johnson, who agreed to promote the study of road building in their papers. From the state engineer and surveyor, H. A. Van Alstyne, he exacted a promise that men would be detailed to help with the proposed course. White, however, did not think that Bailey was sufficiently energetic in securing the \$10,000 appropriation which they agreed was needed for the highway commissioners school and demanded that Bailey be more active.¹²⁸ On May 16-19, 1905, a good-roads conference was held at Cornell, which the Faculty of Agriculture thought so important they suspended all regular work so that the students might attend.¹²⁹ Still, Bailey did not secure the \$10,000 in 1905 or 1906. Early in 1907 he proposed the item to Schurman, stating that the good-roads school would be used to give instruction to all agricultural students since "on the agricultural sentiment must ultimately rest the strength of the movement."¹³⁰ It was thirty-one years later that the school which Bailey desired was finally established.

On April 27, 1907, Cornell University celebrated the hundredth anniversary of the birth of its founder and, quite appropriately, dedicated the new buildings of the College of Agriculture. The dedication featured a round of speeches beginning with Governor Charles Evans Hughes and ending with Director Bailey. It is interesting and somewhat instructive to contrast Schurman's introduction of Bailey with the second paragraph of Bailey's address. In introducing Bailey, Schurman chose, quite immodestly, to review his own "policy of state aid to Cornell" which culminated with "two colleges splendidly housed at the expense of the State, and the State generously appropriates for their support nearly \$200,000 a year." Bailey's statement appears in sharp contrast:

It is first necessary to state a point of view. This College of Agriculture is not established to serve or to magnify Cornell University. It belongs to the people of the State. It will justify its existence only if it serves the people

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of the State. The farmers of the State have secured it; no amount of academic sentiment would have secured it. Their influence has placed it here. They will keep it close to the ground.¹³¹

The new buildings—which included an impressive central structure later named after Roberts, an agronomy building to the west later named after Stone, and, to the east, a dairy building and animal husbandry building—were occupied some eight months before they were completed, the first class being held on October 10, 1906.¹³² On May 23, 1907, “last meeting in Morrill Hall” was recorded in the minutes of the Faculty of Agriculture.

New honors came to Bailey. It was Dr. Bailey who directed the College in its new facilities. He was offered, almost simultaneously, the degree of Doctor of Laws from both Michigan Agricultural College, and the University of Wisconsin. In May, 1907, he chose to accept the latter.¹³³

Measured by Bailey’s personal interest, the most important of the new buildings was the model rural schoolhouse near the agronomy building; it was completed in the spring of 1907 at a cost of \$1,800.* He had been planning this building since 1903 as part of his campaign to improve the condition of rural schools. Since very little money was generally available for rural schools, he intended to construct his model at a price school districts could afford.¹³⁴ In 1904 Schurman refused to permit the construction of this building but the following year agreed that it would be a necessary part of the State College of Agriculture.¹³⁵ Designed to emphasize learning by doing, the building contained two rooms, the smaller being a workroom. Within five years Bailey thought this would have to be enlarged as students responded to what he considered “real education.”¹³⁶ When the building was completed, however, the trustees refused to permit Bailey to organize it as a working rural school. The opportunity to conduct an experimental curriculum was thereby lost, and the building was leased by the University to Martha Hitchcock for use as a private school.¹³⁷

*This building stood in front of Bailey Hall until it was razed in 1962 (*Address at the Dedication of the Buildings of the New York State College of Agriculture*, p. 45).

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The new facilities made possible a substantial expansion of faculty and curriculum. At this time Professor Hunt left Cornell to become dean of the School of Agriculture at the Pennsylvania State College. The Department of Agronomy was abolished and its activities separated into new departments. A department of farm crops was established under George F. Warren, a department of farm practice under John L. Stone, and a department of rural engineering and architecture under Howard W. Riley. The name of this latter department was changed the next year to the more appropriate "farm mechanics," since the work consisted of elementary instruction in the adjustment and operation of farm machinery.* In connection with entomology a start was made in limnology with the appointment of James Needham as assistant professor. The previous year Bailey had persuaded Thomas L. Lyon to accept the newly created chair of experimental agronomy, later changed to the professorship of soil investigation.¹³⁸

The Department of Farm Practice was of especially complex origin. In part it was designed to fill the gap in resident instruction long stressed by Roberts—the development of farming skills. The farm tours which Roberts had successfully substituted for more direct farm practice had not worked out with men who lacked his skill and prestige. Early in 1907 Tuck expressed concern about the effect student misbehavior on these trips was having on local farmers.¹³⁹ That April the faculty decided that after June, 1907, no bachelors or advanced degrees would be awarded unless the candidate had first passed an examination in the practice of agriculture.† The necessary skills could be acquired on farms or through noncredit courses given by the Department of Farm Practice. The requirement had the addi-

*Interview, W. H. Riley, Nov. 14, 1960. Although elementary in terms of later developments in agricultural engineering, the proper adjustment of a walking plow was a skilled operation and one absolutely vital when the power unit had no unutilized capacity.

†Faculty of Ag. Minutes, I, 211. A schedule providing credit for farm experience was established, with 60 farm practice points required for graduation. Up to 10 points, for example, were allowed for "experience in harnessing, hitching, and driving horses" (*Cornell Countryman*, Oct., 1907, pp. 9-10). The farm practice requirement for advanced degrees was rescinded on June 11, 1908 (Faculty of Ag. Minutes, I, 247).

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tional purpose of protecting the College against students who registered there merely to escape tuition payments.¹⁴⁰ The farm practice department also provided a solution to the administration of the university farms after the departure of Professor Hunt. At this time these farms contained 235 acres; however, only about ninety acres were arable, and competition for them was keen among the departments. After a lengthy consideration of possible solutions, it was decided to place the farms under the administration of the Department of Farm Practice, which was not itself doing experimental work.¹⁴¹

The basis was laid for future development in plant science with the establishment of three new departments in that area. A department of plant pathology was created under Herbert H. Whetzel, a department of plant physiology under Benjamin M. Duggar, and a department of experimental plant breeding under Herbert J. Webber. Bringing Webber to Cornell from his position as director of plant breeding investigation at the U.S. Department of Agriculture was a real triumph, for Webber had already attained a national reputation for his breeding of citrus fruits and cotton. A plant industry seminar was established to bring the graduate students together with Webber and the other plant scientists.¹⁴² With the exception of Comstock, Webber, and Wing, the faculty consisted of men who still had their reputations to make. Most of them were former students of Bailey who had acquired several years of experience in other institutions.

From Bailey's point of view, the expansion of facilities did not make a "modern and effective" college of agriculture, but were indications of the state's willingness to proceed toward that end. The University, he said, should perform its duty and inform the legislature and people of the urgent need for barns, for land, and for livestock. Greenhouses too were needed; the poultry department required more money; a chair in forestry should be created; and the instruction of teachers in nature study and elementary agriculture should be put on a sound foundation. Moreover, the University needed to reestablish its formerly preeminent position in the training of agricultural chemists.¹⁴³ The new buildings were hardly adequate the year they were opened. Space was at such a premium that home economics, the only depart-

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ment representing the activities of half the state's population, was relegated to the top floor of Roberts Hall.

The study of home economics had begun in the agricultural colleges in Iowa, Kansas, and Illinois in the 1870's and had come east as part of the broad social movement demanding equal rights for women.¹⁴⁴ In 1905, while inquiring about teachers of home economics, Bailey learned of the outstanding ability of Flora Rose. Two years later he asked Martha Van Rensselaer to make a "very conservative" beginning in resident instruction while carrying on the extension course for farmers' wives. The following month he despaired of luring Isabel Bevier away from the University of Illinois to head the work at Cornell and cast his lot with Miss Van Rensselaer and Miss Rose, whom he made coheads of the work in home economics. He recommended that each be made an assistant professor at an annual salary of \$1,500, Miss Rose to handle the resident work, Miss Van Rensselaer the extension. President Schurman appointed them lecturers at \$1,200 while waiting for the full Board of Trustees to decide whether women should be admitted to membership in the faculty. With a basic staff appointed, Bailey moved to establish a four-year program in home economics leading to the degree of Bachelor of Science in Agriculture, but was halted by Schurman's calculation that sixty-four of the proposed ninety-two course hours in the first three years would be in the College of Arts and Sciences, supported at the expense of the University. By March, 1909, Bailey had temporarily abandoned his plans for the four-year program.¹⁴⁵

Martha Van Rensselaer soon became an aggressive and power-conscious administrator. In 1908 she feared the State Department of Agriculture would get control of home economics and, with the "balance of power" in its favor, benefit from all the pioneering work of Cornell. By 1910 she was actively working to secure a state appropriation for a separate home economics building. She sent Bailey copies of letters to legislators prepared by members of the New York State Assembly of Mothers and the New York State Federation of Clubs which, thoughtfully, had been mailed from different post offices about the state. "They not only did much for our bill," she said, "but they created among the women of the state an interest in the College of Agriculture."¹⁴⁶

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Like home economics, the Department of Poultry Husbandry developed a loyal and enthusiastic constituency in the state. In this field Cornell had a substantial lead over other states, due in large part to the dedication of James Rice. In January, 1907, there were 185 students taking poultry courses.¹⁴⁷ By 1909 the department was paying the price of leadership as its staff was drawn away at much higher salaries by other colleges and commercial institutions. Rice was even forced to train winter course men as assistants.¹⁴⁸ Still he wanted to place the poultry work before more people. An advertising card of the department from that period is studded with phrases like "write to us, come see us, send for an announcement and take a course, arrange for a meeting." The number of winter poultry course applications increased from eighteen in 1909 to eighty-six in 1910.¹⁴⁹ By 1909 Bailey was receiving numerous letters from poultrymen urging increased appropriations for this department. "This is," he replied, "primarily a question for the poultrymen of the State themselves to handle with the Legislature."¹⁵⁰ His advice was followed; in 1910 an intensive campaign for a new poultry building was organized by the New York State branch of the American Poultry Association.*

The Department of Dairy Industry had at that time the largest budget and the greatest impact on the area around Ithaca. In 1904 the department maintained a retail milk route. Most of this milk was purchased from local farmers along with that needed for making butter and cheese.¹⁵¹ In 1907, having already secured two milk plants near Ithaca, Bailey anticipated controlling the milk production of a territory of ten to twelve miles in radius in order to be assured of the 10,000 pounds needed daily for the winter course. These purchases of milk by the College were encouraging the farmers around Ithaca to concentrate on its production. "This will mean," said Bailey, "that eventually the country within our neighborhood will take on a different agricultural character."¹⁵²

The emphasis in the department had not yet turned to fluid milk. New York State then produced nearly one-half the cheese in the United States—at an annual value of five million dollars a year—and

*In 1910 the association published a 31-page pamphlet entitled *Reasons for an Appropriation for the Department of Poultry Husbandry of the New York State College of Agriculture* (James Rice Papers).

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Professor Pearson was anxious to push the manufacture of cheese even harder.¹⁵³ Considerable skill was required to make butter and cheese of a uniform color, flavor and texture. To make certain that winter course students were up to the high standards the department desired, certificates of completion were awarded only after the student had successfully served as manager of a cheese factory or creamery for a year.¹⁵⁴ At the close of the decade the Department of Dairy Industry was anxious to push cow-testing associations as a means for improving New York State dairying but was informed by Professor Wing that this activity fell within the province of the Department of Animal Husbandry.¹⁵⁵

Before 1910 a rudimentary library for the College had been established by setting aside a room for this purpose. All books not purchased on department funds were supposed to be housed there. There was, however, no full-time librarian, and in 1910 the indefinite withdrawal of books led to frequent complaints.¹⁵⁶ The library was administered by a faculty committee, which, in practice, meant the committee chairman. In 1910 Bailey appropriated \$1,250 for the library in addition to the \$400 made available by the University for the purchase of books.*

As an administrator, Bailey established the components of agricultural education as separate disciplines; in his publications he studied the relation of these various disciplines to the body of knowledge from which they emerged. In 1907, while president of the Association of American Agricultural Colleges and Experiment Stations, he took the next logical step and moved toward the examination of how agricultural information and research techniques could be correlated with the total body of science and knowledge; to this end he appointed a commission consisting of President David Starr Jordan of Stanford University, Director Jordan of Geneva, Gifford Pinchot, then chief of the Division of Forestry, and two others. "Here," wrote Bailey to President Jordan, "is an opportunity for you to serve the cause of science." While hoping that they would deal with the fundamental issue he projected, he recognized that these were busy men and allowed them to set the scope of the study as they saw fit. The com-

*Bailey's appropriation covered both book purchases and wages for the library assistant (Bailey to E. O. Fippin, Oct. 29, 1910, Bailey Papers).

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mission's report dealt with the organization and policy which would secure the most efficient expenditure of public money for agricultural research, a subject of considerable significance but treated from a narrower perspective than Bailey desired.¹⁵⁷ Nonetheless, it was characteristic of Bailey to pose problems of this dimension and to bring what power he could to bear on their solution.

In retrospect, Bailey's hope to reorient country life seems little less than fantastic, yet in 1907 one in his position might reasonably have entertained such a vision. The American people were apparently in a receptive mood for planned social change. There was widespread dissatisfaction with the fruits of unrestricted free enterprise. The association of progress with poverty made by Henry George was echoed by countless others, and by the time of Theodore Roosevelt's administration the American people appeared to be ready to use government as an instrument for securing a more desirable social order. This new attitude toward the use of government manifested by a majority of politically active Americans was associated with a renewal of faith in the national destiny. The enthusiastic President Roosevelt was both captive and leader of the people's determination to use government as an instrument for achieving this destiny.¹⁵⁸

One result of the national urge for social reform was the election of Charles Evans Hughes as Governor of New York. In March, 1908, Hughes consulted Bailey about the appointment of a new commissioner of agriculture. Having a close ally in this position was important to Bailey, for the commissioner's contacts with the legislature and with farm organizations could be used to complement his own in advancing a common program. In March, 1908, Governor Hughes appointed as commissioner Professor Raymond Pearson, who had secured the strong support of agricultural organizations in the state. "I think," declared Bailey, "things in the state are now beginning to get into shape."¹⁵⁹

On the national scene, Bailey appeared to be in an equally strong position. By March, 1907, he was corresponding with Sir Horace Plunkett and Gifford Pinchot, both close friends of President Roosevelt. The President was soon to give an address at the Semi-Centennial of Michigan Agricultural College, and Pinchot asked Bailey to outline what the President might say, a request that caused some

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difficulty since Bailey was also to speak at the Michigan celebration. His advice for the President emphasized the need for a thorough and active study of rural institutions and the organization of the open country around the rural school and country church.¹⁶⁰ The President, in talks with Pinchot, Plunkett, and others, considered establishing a permanent "social economic bureau" in 1907, of which Plunkett thought Bailey would surely be appointed head.¹⁶¹ However, the end of Roosevelt's term was rapidly approaching. Early in 1908 Bailey had several talks with the President. The result was a commission appointed by the President to inquire into the condition of country life in the United States.¹⁶² At Pinchot's insistence Bailey became the chairman of this commission and eventually drafted its report.¹⁶³

The advocates of a national movement for reorganizing country life received a setback with the election of President Taft, for it soon became evident that his administration was to depart substantially from the policies of his predecessor. In a controversy over the administration's conservation policies, Pinchot became embroiled with the Secretary of the Interior, Richard A. Ballinger, and in 1910 was dismissed from his post as chief of the Bureau of Forestry. The value to be derived from the evidence collected in the coast-to-coast hearings of the Country Life Commission depended on the wide circulation of the commission's report, but the Taft administration was unwilling to publish this document.¹⁶⁴ Bailey did not seem discouraged by the philosophy of the new national administration. Its hold on the government was limited to four years, and Bailey had faith in democratic processes. While awaiting an improved political climate on the national scene, he turned toward rejuvenating the New York State Agricultural Society as a vehicle for a country life movement in New York State.¹⁶⁵

In 1909 country life sentiment was at its height; from that time the movement went into a long decline through inability to develop a program to accomplish the desired reform in rural life. The country life movement remained as it had been—diffuse, romantic, and generally ineffectual. Had the issue of rationalizing the conflicting elements within the movement been forced in 1909, it might have expired then instead of lingering on. The area of conflict was both

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between and within individuals. Bailey's concept of country life, for example, combined progressive elements from current science and technology with regressive elements from his own frontier boyhood.

In 1910 he took Roosevelt's phrase, "the fighting edge," as his text in several lectures, arguing that the strenuous quality of country life was a virtue to be preserved. "I think," he wrote, "that we have made a serious mistake in overemphasizing the sulky plow and in endeavoring to make agriculture appear easy."¹⁶⁶ He wished to reintroduce the rural games of his childhood and preserve the rural school as the focus of local pride and initiative.¹⁶⁷ Some of Bailey's actions, however, were directly opposed to these ends. In 1910 he asked Dean V. A. Moore of the Veterinary College to advise the winter course students to take a bath at least once a week since he was trying to introduce plumbing into rural homes and wanted students to get used to the idea.¹⁶⁸ He recognized that economic changes were forcing the rapid abandonment of the marginal land in the state and had no sympathy with the back-to-the-land movement which would preserve the rural institutions he apparently desired.¹⁶⁹ These contradictions—and there were many more—were all involved in a context of power. A planned reorganization of country life required an extensive application of power from a central source, but the essence of country life for Bailey was the freedom it provided.

Freedom and control were the two central elements in Bailey's administration; his pursuit of these two somewhat conflicting goals affected practically all of his actions as dean and director. Beyond this, almost every generalization about Bailey as an administrator is subject to numerous exceptions. His flexibility as an administrator was enhanced by a pronounced skepticism about the sanctity of regulations. "I do not see," he wrote his old friend "Uncle" Henry Wallace, "how it is possible for any people to make any progress if everything is held within the literal interpretation of the statutory law. We all know how laws are passed and why."¹⁷⁰

Bailey tended to organize the College around men rather than fit men into an organizational structure. In 1907 he wrote a potential faculty member, "In my mind it is not so important to teach certain subjects as it is to have certain men; therefore, I like to get men and then try to arrange the work so they can do their best."¹⁷¹ In many

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cases this meant establishing a new department, a procedure that laid the basis for future expansion and, it may be noted, preserved for the director a larger element of control than if these faculty positions were made subordinate to department heads. The Departments of Drawing and of Meteorology, established in 1908 and 1909, respectively, each had a faculty of one.

Department heads were responsible to the director for the operation of their departments, including the promotion of department members. In this latter respect, however, the power of the department head was more illusory than real; for when Bailey had objections he stated them rather pungently, concluding that he would, of course, follow the wishes of the department head.¹⁷² Rarely, after such a reply, did a department head press the issue. The courses taught were determined by each department, and here Bailey refused to intervene, even when repeatedly asked to do so by men he generally favored.¹⁷³ The administration of the experiment station work was completely informal. Bailey studiously avoided the project reports used by the U. S. Department of Agriculture, preferring, he said, "to be in touch with the men rather than with their formal projects."¹⁷⁴

The organization of the soils work into a single Department of Soil Technology in 1909 represented a departure from his previous position of separating the teaching and investigational work. Such consolidation, he said, would aid "the growth and future development of the work when all of us have ceased our active connection with it."¹⁷⁵ His plan to unify the soils work was facilitated by the ready cooperation of the two professors involved.¹⁷⁶

Everything connected with the College of Agriculture concerned Bailey. In October of 1907 he asked to have a telephone installed in the boiler room of the new buildings so he could call the night watchman. "I have these buildings on my mind all night," he told the university treasurer; "I often come up at night to see how things are going." To keep the buildings "models of neatness," he instructed the faculty in the proper supervision of the janitors and personally ordered uniforms to fit each janitor. Not until 1910 did he deal with helpers and mechanics through a subordinate officer.¹⁷⁷

If the College of Agriculture were to lead in the rationalization of

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the rural life of the state it was essential for it to achieve and maintain a position in the communications network between agencies of the United States Department of Agriculture (USDA) dealing with agricultural education and the individuals (and organizations) in the state receiving this education. The success of the College was thought to depend on maintaining cooperative relations with the agencies of the USDA while at the same time preventing these agencies from developing a direct relationship with its constituents. Director Jordan took a similar view of the interests of the Geneva Station.

In 1907 a crisis occurred between Cornell and Geneva on the one hand and the Bureau of Plant Industry on the other over which agency was to do research on grape rot in a particular vineyard at Romulus, New York. Bailey and Jordan felt that the intervention of the national Department of Agriculture, even though requested by the State Department of Agriculture, threatened a loss of freedom in research through centralization of authority.¹⁷⁸ "States should take the responsibility for solving their own questions just as far as they are able," Bailey wrote the owner of the vineyard in question, adding: "The responsibility should not be transferred to agencies outside."¹⁷⁹ In *The State and the Farmer*, Bailey developed this position:

They [the colleges and experiment stations] would not think it right, however, to have independent laboratories or fields developed alongside, even though requested by persons in their own state or by the state department of agriculture, not because of jealousy (for jealousy should be unknown to scientific men) but because such action would tend to diminish the confidence of its own people in the local institution, depriving the institution of the support it needs for the work for which it was created, and encouraging in the people a desire or willingness to shift responsibility.

Bailey was far too sophisticated to leave this statement without qualification. He knew that the centralization of power in federal agencies was both necessary and inevitable. Still, he thought, local initiative and vitality could be preserved if only "a clear distinction of functions was maintained."* The United States Department of

*Pages 101-102. In the next sentence, which is far from clear, Bailey indicates what he means by a clear distinction of functions. Bailey was ordinarily a remarkably lucid writer. His difficulty apparently stemmed from attempting to square subjective feelings with his observations of social change.

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Agriculture could properly undertake work in the state, he said, only if seeking regional information on a problem of national scope or if the "inefficiency or incompetency" of the state institution made such intervention necessary for the benefit of the state.¹⁸⁰

As real cooperative work developed, Bailey urged, the U.S. Department of Agriculture would have less need for independent relations with individual farmers in the state.¹⁸¹ The issue, of course, turned on what constituted real cooperation. Bailey desired mutual planning of proposed research rather than initial planning at the national level followed by a proposal of cooperation. This was the subject of a heated exchange between Bailey and Beverly T. Galloway, chief of the Bureau of Plant Industry, in which Bailey charged Galloway with not cooperating with the federal agencies on the scene until the work was already planned.* Certainly part of this interchange was the rationalization of ambitious men. There was less need for rationalization between friends. Said Jordan: "If the Department is to be constantly anticipating us, we shall be forced to pluck the second quality of fruit from the scientific tree. I am anxious that the stations in this state shall till the scientific field that is rightfully within their borders." When Professor Warren was considering cooperating with the USDA on research in pasture and hay production, Bailey advised him to "attack the problem with the funds at your disposal if for no other reason than to hold the ground."¹⁸² The officers of the USDA were equally aggressive in attempting to use the State Department of Agriculture as a means for securing entry into the state. In March, 1908, Commissioner Weiting complained that employees of the USDA were writing to his subordinates in an attempt to secure an invitation for further soils work in the state.†

*Galloway to Bailey, April 9, Bailey to Galloway, April 15, 1907, Bailey Papers. If the department were seeking regional information on a national problem, as Galloway claimed, it would seem natural for the initial planning to occur at the national level. Bailey often used the phrase "federal agencies" to refer to the Cornell and Geneva Experiment Stations, which divided the Hatch and Adams funds on a 90-10 basis.

†C. A. Weiting to Bailey, March 8, 1908, Bailey Papers. When Pearson became commissioner of agriculture, he joined Bailey and Jordan in opposing USDA incursions into the state.

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In 1907 the United States Department of Agriculture, without consulting Cornell or the Geneva Experiment Station, organized a convention in cooperation with the Syracuse Chamber of Commerce to consider the problems of New York State agriculture.¹⁸³ In 1908 the national department conducted dairy investigations in the state without consulting Cornell or Geneva.¹⁸⁴ In 1909 it conducted farm demonstration work in the hill lands of Tompkins County without consulting Cornell even though the College had devoted several years to a thorough survey of these lands. In connection with this work the Secretary of Agriculture and the chief of the Bureau of Soils came to Ithaca and stayed overnight without calling at the College.¹⁸⁵ In this situation it is not surprising that Acting Director Webber regarded Alfred University's use of USDA pamphlets in its extension work as "playing into the hands of the Federal Department to our detriment."¹⁸⁶

The U.S. Department of Agriculture, however, was far from monolithic. During the decade 1901-1910 agricultural education at Cornell progressed in many areas through cooperation with its officers. For three years the Bureau of Soils provided the College with a professor of soils and gave temporary appointments for advanced study at the department to as many as six Cornell students a year.¹⁸⁷ In 1906 the Departments of Dairy Industry, Agronomy, and Horticulture were doing cooperative work with a division of the USDA.¹⁸⁸ Throughout the decade Bailey cooperated on frequent occasions with A. C. True, the director of the Office of Experiment Stations. In 1908 the third Graduate School of Agriculture was held at Cornell with Dr. True as dean.* The Department of Meteorology was maintained through cooperation with the USDA, the College providing quarters, heat, and light in return for instruction in meteorology.¹⁸⁹

The relations of the College to the University were a comparable

*These graduate schools, sponsored by the Association of American Agricultural Colleges and Experiment Stations, were intended to bring college and experiment station workers abreast of the latest information and techniques in their fields. The four-week session at Ithaca had a faculty of 61 and an enrollment of 163 (*Proc. of the 22d. Ann. Convention of the Association of American Agricultural Colleges and Experiment Stations*, 1908, pp. 18-25; Bailey to True, Feb. 18, 1908, March 17, 1909, Bailey Papers).

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study in conflict and cooperation. The basis for the conflict was Bailey's insistence that where the interests of the College of Agriculture were affected he should occupy a position relative to the people of the state similar to that of the President of the University. Bailey did not grant a similar status to Director James Law since he considered veterinary medicine a part of agriculture, which should be under his own administration. Bailey had presented his arguments for the unification of the state colleges in 1903, and Schurman later promised him an opportunity, on the proper occasion, to state his views to the trustees. The occasion came with the approaching retirement of Director Law in 1908. Bailey argued that unification would be politically beneficial by presenting a united front in Albany and educationally beneficial through relating the veterinary work more closely to the agricultural interests of the state.* Dr. Law made a stinging analysis of Bailey's position. Veterinary medicine, he held, was more closely related to human medicine than to agriculture. From this premise he developed his arguments that the work and prestige of the Veterinary College were certain to suffer if it were subordinated to agriculture. Bailey, he suggested, would "make a catspaw" of the Veterinary College for the benefit of the College of Agriculture.† The trustees decided to continue the separation of the colleges and appointed Veranus A. Moore as Dr. Law's successor.

The lack of authority over the funds available to the College challenged Bailey to achieve a freedom in administration greater than that currently permitted by the Executive Committee of the Board of Trustees. In order to prevent departments in the University from bidding against each other for the services of clerks and stenog-

*Bailey also called up the memory of the late Speaker Nixon, who, he said, had favored the unification of the state colleges at Cornell. Bailey's letter to Schurman, dated Jan. 28, 1908, is printed with Law's memorandum at the end of *Cornell University Trustee Papers - 1907-1908*.

†Apparently Bailey had no knowledge of Law's memorandum, which had been prepared in 1905. After its appearance in the printed record, Bailey protested in a letter to Schurman that Law's statement reflected on his integrity. Five days later, however, he withdrew the letter and destroyed it in Schurman's office. Schurman assured him that neither he nor the trustees had any doubt of the "integrity of your motives" (Schurman to Bailey, April 1, 1909).

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rappers, thereby leading to a higher wage scale, the Executive Committee had established a schedule of maximum wages for the University. This had the effect, said Bailey, of making the College of Agriculture "a training school for stenographers."¹⁹⁰ The work in other colleges, Bailey declared, was "largely passive," but the College of Agriculture was "conducting a business organization" in which the professors were too busy to train office help.¹⁹¹

Measured by the quantity of correspondence involved, the schedule of maximum wages was one of the principal sources of friction within the College and between the College and the University authorities. One case was especially galling. Through some pointed correspondence with the federal Department of Agriculture, Cornell and Geneva had together secured control over the grape rot experiments in the Romulus vineyard only to have the instructor in charge resign because Bailey's recommendation for a \$1,000 salary was reduced to \$850 by a committee consisting of President Schurman, Treasurer Williams, and Trustee R. H. Treman, in order to avoid a precedent justifying a general increase in instructors' salaries.¹⁹² Even the College income funds were outside Bailey's control. It was the University practice to pay a deceased professor's salary to his widow for the remainder of the year, but Bailey was prevented from using college income funds for this purpose.¹⁹³ In other cases the trustees changed the college budget without consulting Bailey.

In 1908 the budget of the Department of Entomology and General and Invertebrate Zoology, already housed in the agricultural buildings, was transferred to the College of Agriculture, effective in 1909. While Bailey protested this action, it was, from the point of view of the University's authorities, perfectly sound and justifiable.¹⁹⁴ Under the legislation establishing the State College, the University was to continue its support which amounted at the maximum to an annual appropriation of \$5,700, plus the 1,669 course hours which agricultural students took in the endowed divisions of the University. The hours of accessory instruction, however, multiplied with the rapid increase in agricultural students. The transfer of the Department of Entomology to the College of Agriculture thus made possible a temporary financial adjustment.¹⁹⁵

There was also a difference of opinion between Bailey and the Uni-

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versity authorities over the location of dairy barns authorized by the state in 1908, although in this instance Bailey was less concerned about the issue than Professor Wing. Wing wished to locate the new barns near the animal husbandry building—now the site of the Plant Science Building—but the trustees insisted on locating them east of the Judd Falls Road, a distance across an open field from the animal husbandry classrooms.¹⁹⁶ Time has demonstrated the wisdom of the trustees' judgment. By the 1950's the development of the campus made the site adjacent to these barns the obvious location for new classroom and research facilities for the Department of Animal Husbandry.

Conflicts between the trustees and the administrators of agricultural colleges and experiment stations were common enough at the time. Bailey received numerous letters from fellow administrators in other states describing difficulties with their boards of control, usually of a more serious nature than he was experiencing. When asked about the relationship between the governing board and the lack of continuity and permanence in agricultural research, Bailey replied without qualification that any difficulty in agricultural research at Cornell "is not due to the faults of the governing board."¹⁹⁷

In May, 1909, Bailey resigned from the University in accord with his frequently stated desire to retire at fifty so that he might devote the remainder of his life to his own interests.¹⁹⁸ He had considered resigning in 1908 and further discussed the matter with Commissioner Pearson in the spring of 1909.¹⁹⁹ In his resignation he stressed the fifteen full summer vacations he had been on the job during his twenty-one years at Cornell.²⁰⁰ He applied to the Carnegie Foundation for his retirement allowance, wrote to Thomas Cook and Son for South Sea travel information, and informed a correspondent who asked him about his first name that "the name represents quite perfectly my whole philosophy in life. My whole desire is to be free in every way."²⁰¹

This resignation occurred at a difficult time. His highly personal method of administration made a smooth transition to a successor difficult, and Commissioner Pearson, the anticipated successor, was opposed by a substantial part of the Faculty of Agriculture. The trustees were anxious to avoid dispute. In May, 1909, R. H. Treman

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asked Bailey to remain, adding that if his retirement were "due to any restriction of the work on the part of the President or the Trustees" they would remedy the situation.²⁰² Bailey's response combined future hopes with past complaints. The director, who Bailey said is responsible to the people of the state, should be able to formulate plans and carry them through the legislature. After noting that the Executive Committee had appropriated and reappropriated college funds without consulting him, he declared that it was the disposition of the Veterinary College matter that really determined his present course. Through its unification with the College of Agriculture he had hoped to "bring a united policy to bear on the problem of rural civilization."^{*}

During the summer and fall of 1909, while Bailey was officially on sabbatic leave, the conditions under which he would remain as director were gradually worked out. Bailey left others to carry on the brunt of his conflict with the trustees while he appeared to be outside the contest. In July, Director Jordan suggested that if his retirement were due to unsatisfactory conditions, a "strong movement" might be made by alumni and friends to have them rectified. "I have no expectation whatever of resuming my connection with Cornell University," Bailey replied. "My preference in this matter is that nothing be done about it." "I shall really look to you, as my friend, to see that there is no movement in the state looking to 'correcting' things in my behalf," he wrote Pearson, adding that a group of farm organization leaders had met him in Syracuse recently with that in mind but had been assured he had no grouch. "There is nothing in the world that I want," he wrote to F. N. Godfrey of the State Grange.²⁰³ In October, 1909, Professor Albert R. Mann, who was probably Bailey's closest colleague at Cornell, wrote Governor Hughes in a vein that indicated how Bailey's actions were interpreted by his associates:

Please permit me to add my voice to those that have already reached you concerning Dean Bailey . . . He has labored against hard and exasperating

^{*}Bailey to Schurman, June 4, 1909, Bailey Papers. When in September, 1909, Bailey again raised the issue of the Veterinary College, Schurman said he believed unification would have led to the resignation of the dean and faculty of the Veterinary College (Schurman to Bailey, Sept. 28, 1909, Schurman Papers).

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odds. His very bigness prevents him telling anyone the fundamental difficulties and discouragements, and he courageously gives as his reason for leaving, his desire to be free. It is just this bigness that the college needs. His associates here are convinced that it is his sincere desire to carry this work forward to a higher and more effective place, and that he will gladly return if it is made possible. No one outside the college can estimate our loss.*

On September 19, 1909, Andrew D. White, then a member of the Board of Trustees, recorded in his diary that Bailey "now consents to stay third year. Much debate in view of possible trouble between Bailey and Pearson factions. I favor conciliation with B and retaining him as long as possible at almost any sacrifice.†

A solution to the conflict between Bailey and the Executive Committee was adopted by the Board of Trustees on November 6, 1909, with the appointment of a seven-member standing committee on state colleges.²⁰⁴ The idea was Schurman's, which he presented, almost in passing, in a twelve-page conciliatory letter to Bailey dated September 28, 1909. Bailey immediately seized this suggestion, which, he said, agreed with his own thinking.²⁰⁵ Both Bailey and Schurman recognized the need to develop within the trustees a group especially informed about the interests of New York State agriculture which would advise the director of the College of Agriculture and review his budget and appointments. The establishment of a standing committee on state colleges was a step in that direction.

The structure of authority over the College of Agriculture was, of course, part of the larger issue of the relation of the University to the state. Both President Schurman, who had in the College of Agriculture an example of what might be accomplished through greater access to public funds, and the commissioner of education, Andrew

*Mann to Hughes, Oct. 16, 1909, Bailey Papers. A pamphlet entitled *Echoes from Alumni Regarding the Resignation of Director L. H. Bailey* almost certainly dates from this period. It contains thirty letters written in response to a statement by an alumni committee in Ithaca that "unsatisfactory conditions" relative to the University were causing Bailey's resignation. The pamphlet bears no date or place of publication (Rice Papers).

†R. M. Ogden, ed., *The Diaries of Andrew D. White* (Ithaca, 1959). Other evidence indicates that the statement "he now consents to stay third year" must be taken to mean he now opens the possibility of staying a third year.

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S. Draper, who desired a state university system in New York, favored steps toward making Cornell University more the instrument of the state.²⁰⁶ In 1909 the state increased its potential influence over Cornell University by adding to the Board of Trustees five members to be appointed by the Governor.²⁰⁷ On June 23, 1910, the Committee on State Colleges was altered in line with Bailey's wishes to include the state trustees appointed by the Governor, the commissioner of agriculture, the trustee elected by the State Grange, and, representing the interests of the University, the President, the treasurer, and Trustee Van Cleef.²⁰⁸

If, in certain respects, membership in the University proved harmful to the College of Agriculture, it proved beneficial in other ways. Its students received instruction in the basic sciences, English, and other liberal arts which the College of Agriculture was in no position to provide. Moreover the standards of scholarship maintained by the University served as an incentive to the Faculty of Agriculture. The pressures to conform to the standards of the College of Arts and Sciences were probably no less intensive than in Professor Roberts' day. Director Bailey's efforts to develop a college combining intensive research in the biological sciences with high-quality teaching were certainly aided by the association of the College with Cornell University.

In the relation of the College to other state institutions dealing with agricultural education, it was the hope of college and university authorities to maintain the *status quo* and, if possible, bolster existing relationships with additional sanctions. In February, 1909, Bailey, Schurman, and Pearson were developing plans to make certain that the agricultural schools at Morrisville and at Alfred and St. Lawrence Universities acted as feeders to the College of Agriculture and did not become agricultural colleges in their own right.²⁰⁹

That summer Webber became acting director for the period Bailey was on leave, and, unlike the usual occupant of temporary authority, pushed forward existing programs and developed new ones. In November, 1909, he sought additional support for Cornell's relationship to the secondary schools of agriculture by asking Dick Crosby of the Office of Experiment Stations to make a survey of secondary agricultural education in New York State in preparation for a con-

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ference of state leaders called by Commissioner Pearson for January 19, 1910. Webber felt that matters were rapidly approaching a crisis. In 1909 eleven bills had been introduced to establish additional secondary agricultural schools. Webber hoped that the January conference would be sufficiently authoritative to head off this movement.²¹⁰ As expected, the conference took the position that the number of agricultural schools should be limited and that agriculture should be introduced into the regular high schools of the state. Webber, who had noted "some movement toward establishing other colleges in the state as this one became overcrowded," was pleased that the conference recommended only one state college of agriculture.²¹¹ The conference, however, did not have the desired effect. In April, 1910, a bill was introduced to establish an agricultural school at Cobleskill and a move was under way to establish an agricultural school or subexperiment station in Niagara County.*

Cornell was able to exercise a degree of control over the introduction of agriculture into the regular high schools through cooperation with the State Education Department. In 1909 Webber prepared the Civil Service examination for the key position of inspector of agricultural education, the occupant of which was to determine those qualified to teach agriculture in the secondary schools. With the strong support of President Schurman, a summer school was planned for 1911 which would prepare teachers of secondary agriculture.²¹²

In determining the relation of the College to the state government and to the other institutions engaged in agricultural education in the state, Bailey, the director of the College, contended with Bailey, the political scientist. In *The State and the Farmer*, he expressed the desire to be free of the need to turn politician in order to secure the needs of the College. In this book he suggested the establishment of boards or commissions in state governments which would conduct annual studies of institutions engaged in agricultural education and made recommendations on their comparative needs to the legislature. In his annual report for 1909, however, he departed completely from

*Webber was placed in the position of drafting the bill for the Niagara County experiment station in order to have it coordinated with Cornell. This bill failed to pass (Webber to Mark D. Williams, April 21, 1910, Bailey Papers).

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this sound advice, taking the position that the high aims of the College placed it in a different relation to the state than other institutions:

I think the time has come when this College of Agriculture should throw itself directly on the people of the state, acquainting them with the work that needs to be done . . . The legislature does not yet realize that a college of this kind should be a regular part of the state program. It is not merely another institution, competing with those already in existence, but a new kind of enterprise having for its object the betterment of the State and the training of young men and women to live hopefully and resourcefully in the country.²¹³

In 1910 he favored a state plan of agricultural education which would preserve the complete autonomy of each institution and at the same time "appeal to the legislature and the people as a wise and progressive program."²¹⁴ This plan found wide support among those involved in the administration of agricultural education in the state. In its implementation Bailey quickly emerged as chief planner.*

In 1909 the University asked the legislature for \$200,000 for operation and maintenance plus \$75,000 for a new auditorium. Bailey organized a letter-writing campaign, with John W. Spencer alone getting about thirty-five farmers to write the chairmen of the Senate Finance Committee and the Assembly Ways and Means Committee.²¹⁵ Bailey arranged to bring the members of these committees to Ithaca for a two-day inspection of the College, Speaker Wadsworth being rushed from Owego on a special train provided by the University.²¹⁶ The result was a total appropriation of \$185,000, an increase of \$15,000 over the previous year, but an amount insufficient to satisfy Bailey. When Speaker Wadsworth took credit in print for "liberal appropriations for increased facilities at the State College of Agriculture," Bailey took the unusual step of writing the Speaker that this was not true and that enrollment would have to be restricted.²¹⁷ The failure of the state to provide sufficient support Bailey called "the hardest blow that has struck the College of Agriculture since my connection with it."²¹⁸

While the University exercised rather close control over the College of Agriculture, a great area of administrative freedom remained

*See page 232.

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between the College and the state. Once the director's budget was approved by the University's trustees, he could approach the legislature directly. When the College's appropriation was approved by the Governor, it was granted in a lump sum to be segregated by the University without interference from state agencies. The income funds of the College, which in 1910 amounted to 35 per cent of the total funds available, were completely under the control of the University. There was not even an obligation to account for these funds to the state government.²¹⁹ These income funds, which came from tuition and the sale of goods and services produced at the College, did not come within statutory restrictions on the use of state appropriations.

EXTENSION

It was with College income funds that Bailey financed the gradual retirement of John W. Spencer. He had tried on several occasions to secure a pension for Spencer but found that the regulations governing pensions were not sufficiently broad to cover his unique position.²²⁰ Finally, in 1908, Spencer was made representative of the College in Chautauqua County with whatever duties he felt able to handle. Measured by immediate contributions to the people of the state, few educators were more deserving of reward than this farmer who visited nature study clubs and school gardens in all parts of the state. Some fifty years later an elderly woman, reflecting on how much the study of nature had enriched her life, recalled:

I first become interested in nature through "Uncle John Spencer," who came to our home at Cooper's Plains, New York, to try to get a nature club started among the country children . . . Professor Spencer gave us a vivid program to follow and I enjoyed writing my monthly letter to him and kept my eyes wide open to see the unusual things he said were free to us all.²²¹

Spencer's retirement marked the end of the time when the College might be represented by men who themselves lacked a college education. Spencer's strength as an educator lay in his ability to draw together information in a way that appealed to the imagination and curiosity of the learner. It is almost certain, however, that in covering

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such vast areas of knowledge, he sometimes lapsed into technical error. Increased emphasis on technical accuracy was a consequence of the narrowing focus of individual departments toward agricultural science. While such accuracy was vital to the further development of science, it presented obstacles to effective communication, especially in extension. Cornell lost an articulate advocate of the broad view of knowledge when Spencer retired; the problem of the relative importance of technical information and communication skills in extension work remained behind him.

The extension work of the University assumed a more definite organization with the establishment of an extension department under Charles H. Tuck in 1907. The department had two functions: to coordinate the extension activities of the other departments and to publicize the work of the College.²²² In the early development of the department these functions were quite compatible, publicity following from contacts made throughout the state in the course of the extension work. The farm train was a principal means of making these contacts.

In November, 1908, the College ran its first "farm special" over the Erie Railroad. The initiative came from officials of this railroad who were anxious to improve the agriculture along its lines.²²³ It had long been railroad policy to aid the education of farmers by offering reduced rates to farmers attending institutes and other educational meetings. The farm train reversed the process by taking education to the farmer. Such trains had already proved very popular in the Midwest and Jared Van Wagenen, Jr., who had lectured on a farm train in Maryland, assured Bailey of its educational value.²²⁴ On November 23-25 the first Cornell farm train, under the direction of Professor Tuck, ran through what the *Country Gentleman* called a "poorly farmed and somewhat underdeveloped section of the state." Stops of one hour provided time for lectures to adults while the school children, who at first proved rather disturbing, were gathered at the rear platform, where one of the speakers attempted to interest them. Since the function of the farm train was primarily to arouse interest among the audience, vast quantities of pamphlets were distributed. Cornell, concluded the *Country Gentleman*, was "well advertised."²²⁵ The following spring the New York Central ran a

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farm train through the good farm country in the Ontario Lake Plain. Twenty people from the College aboard the train lectured to a total audience estimated at 10,000. Up to ten meetings a day were held for four days, the first at seven in the morning, the last in the evening. Regarded by the faculty as missionary work, it seemed an appropriate way to spend the Easter vacation.²²⁶ During the college year 1909-10, Cornell ran five farm trains over four railroads reaching a total audience of over 30,000. These trains were operated in cooperation with the State Department of Agriculture and the state agricultural schools.²²⁷ This cooperation involved complications. In 1910 Webber accommodated the president of the Northern New York Corn Growers' Association—only recently organized at the agricultural school at St. Lawrence University—by agreeing not to emphasize dairying on the projected farm train through the area.*

The extension activities of the College were concentrated in the better agricultural districts of the state, since people in these areas were most prepared to utilize the services the College offered. "We have now reached the point when we must take up the more difficult situations and conditions and meet them on their own ground," Bailey declared in 1907.²²⁸ To achieve this goal was another matter, for the recommendations of the College, when they could be understood and accepted as desirable by farmers in the poorer agricultural areas, were frequently not applicable, because these farmers lacked financial resources with which to implement the recommendations. In 1910 Bailey noted that the work was still unevenly distributed. As a step toward correcting this situation, he planned to have maps made which would show the location of all the extension activities of the College.†

To inform the public about the work of the College, Professor Tuck, in 1909, began issuing press releases in the form of mimeographed

*In terms of educational outcome this was a questionable compromise, for the northern part of the state was not particularly suited for the production of corn for grain (Webber to William H. Daniels, May 2, 1910, Bailey Papers).

†Bailey to the Heads of All Departments, Nov. 18, 1910, Bailey Papers. His insistence in this memorandum that all field trips be reported to the Extension Department indicates that this department had not yet developed into an effective coordinating agency.

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letters to editors. These were apparently adequate for the editors of newspapers but did not satisfy the more specialized interests of editors of agricultural periodicals. In 1910 Bailey urged Tuck to request systematically news from each department for transmission to the agricultural press.²²⁹

The Extension Department was also responsible for exhibits which the College displayed at the state and county fairs and at important meetings of farm organizations. By 1909 the State Fair at Syracuse had become the principal annual event in New York agriculture and in that year was extended from four to six days. The preparation, transportation, and servicing of the Cornell exhibits at Syracuse and other locations required considerable effort.²³⁰ In addition, by 1910, the department was also instructing students in public speaking and extension work, organizing an annual farmers' week, and taking a prominent part in the work of the farmers' institutes.²³¹

Commissioner Pearson's appointment of Professor Tuck as section director of farmers' institutes was a step toward the closer integration of the institute work with the College of Agriculture.²³² The decade 1900-1910 saw the institute movement at the height of its popularity. Since the 1880's these meetings had evolved into a pleasant combination of education and conviviality. Arranged by local people and frequently accompanied by vast amounts of home-cooked food served by the young ladies of the community, the institute meetings provided a comfortable medium for the communication of information. Martha Van Rensselaer was a frequent participant and more than anyone else established the women's institutes—a special division of the farmers' institutes — on a successful basis.* After 1910 the farmers' institute became less important as a medium for agricultural extension because its lecturers, most of whom were "practical farmers with a gift for gab," could not master the technical information flowing from the rapidly developing disciplines in agricultural science.† In 1909 Acting

*Director F. E. Dawley said, "Miss Van Rensselaer had done about as much in establishing Women's Institutes as the Department has" (Dawley to Bailey, Oct. 24, 1906, Bailey Papers).

†The phrase was used by Jared Van Wagenen, Jr., who was connected with the farmers' institute work in the state longer than any other person (tape recording, undated).

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Director Webber facilitated a temporary adjustment of the institute system to the farmers' developing demand for technical information by reorganizing the normal institutes. Instead of having the entire institute force attend the same lectures at the normal institutes held at Cornell, he split the force into sections, each one taking up a special subject.*

The first Farmers' Week, held in 1908, was an outgrowth of the annual meeting of the Experimenters' League and the desire of mature farmers for a winter course of two or three weeks' duration. Neither Bailey nor the faculty wanted to organize such a course but thought that similar educational ends might be accomplished at an annual farmers' convention of about a week's duration. Such a convention would also provide a meeting place for agricultural organizations and other friends of the College and give old students an opportunity to get reacquainted.²³³

Although a printed program was prepared for the first Farmers' Week, conflicts between events were so numerous that a blackboard was set up on which the latest information was recorded. About three hundred persons attended. Many were attired in work clothes, which, in well-heated rooms, indicated recent acquaintance with hay and animals. The enthusiasm of both guests and students was substantial. At the end of the day the participating students were rewarded when Misses Rose and Van Rensselaer demonstrated the cooking of steaks for their benefit.²³⁴

The following year Farmers' Week combined lectures, demonstrations, and exhibits; the students and faculty prepared weeks in advance for their part in the week's activities. Arrangements were made with townspeople living near the College to accommodate the visitors. Although held the last week in February, when winter was at its height, 1,200 people were registered and, it was thought, five hundred others were present. The week provided "a true uplift" stated one older farmer.²³⁵

Special conferences were held in connection with the week's activities. A poultry institute was featured in 1909. A 1910 conference

*Webber to Jordan, Nov. 2, 1909, Bailey Papers. The State Department of Agriculture gave the College complete control over the normal institute programs (Dawley to Bailey, Oct. 16, 1905, Bailey Papers).

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of country pastors was considered quite successful in spite of being organized on short notice.²³⁶ Permanent organizations were also formed. In 1908, at the instance of Professor Webber, the New York State Plant Breeders' Association was organized with some thirty charter members. The following year the New York State Drainage Association was formed with Professor E. O. Fippin as president. It was said to be the first organization of its type in the country.²³⁷

Unquestionably, the most pleasant extension activity was the school picnic, an annual event held at the College for Tompkins County school teachers, children, and their parents. Mornings were devoted to athletic competition. In 1908 the freshmen won an interclass tug of war but were in turn defeated by the faculty, captained by Rice and Bailey. In the baseball game Bailey ran to home plate on a passed ball. Later, 1,200 children and parents marched behind the cadet band to the new buildings, where they were addressed by Bailey and "Uncle John." Professor Warren talked on alfalfa in the auditorium. As a climax to the day's events, the band led the way to the model schoolhouse, where a flag was raised on the newly erected pole.²³⁸

Demands for extension services were much more numerous than the College was able to meet. Requests for on-the-farm advice, ranging from a study of soil conditions to an analysis of farm management procedures, resulted in charges of unfair treatment when all the requests could not be granted. The Department of Rural Art was especially subject to this difficulty. To grant requests for complete landscape gardening plans placed the College in the position of competing with private operators, and difficulty arising over charging for such work led to the resignation of a member of the department. Merely answering the incoming mail posed a challenge. In the college year 1909-10, about 300,000 requests for information were received of which about 40,000 were answered by personal letter.²³⁹

Agricultural extension work in the United States developed during the decade 1901-1910 in a manner comparable to that of the experiment stations in the 1880's. Extension work, like agricultural research in the earlier period, was being conducted by the states and the federal government quite independently. Following the earlier pattern, the Association of American Agricultural Colleges and Experiment Stations was moving toward becoming a coordinating

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agency for existing extension activities and a medium for securing federal support for the extension programs of the state agricultural colleges. By 1909 Bailey's friend and confidant, Kenyon L. Butterfield, had organized those forces within the association favoring increased emphasis on extension work to amend the association's constitution by establishing a section on extension. Butterfield also secured association approval of the plan to approach Congress for an annual appropriation of \$10,000 to each state for extension work, with additional funds provided by the state to be matched from the federal treasury.²⁴⁰

RESIDENT INSTRUCTION

Both the extension and experiment station work took second place to resident instruction during the second half of the decade. Student numbers quickly increased to the point where course work occupied almost the entire time of the faculty members paid from state funds. Enrollment during 1906-1910 was as follows:²⁴¹

<i>Year</i>	<i>Regular</i>	<i>Special</i>	<i>Graduate</i>	<i>Winter</i>
1906-07	145	133	36	244
1907-08	206	142	43	270
1908-09	268	145	58	364
1909-10	419	120	57	371
1910-11	597	169	80	477

By the time the new buildings had been occupied three years, they were badly overcrowded. Faculty members used a variety of methods to restrict the size of classes to the available facilities, Whetzel basing admission on academic average; others selecting their students by lot.²⁴² The rapid increase was not due to conditions associated exclusively with Cornell; other major agricultural colleges were also experiencing comparable increases in enrollment.²⁴³

During the decade after 1900 students were admitted to the four-year program either by school certificate or entrance examination. Where a question existed about the standing of an applicant, Bailey was inclined to give the student the benefit of the doubt, stating in one instance, "This you are to consider is a distinct violation of our regulations and in no way must be regarded as a precedent for

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anyone else.”²⁴⁴ In 1908 Bailey decided to allow agriculture as an entrance subject, a step President Schurman quickly reminded him he should have taken only with the permission of the University Faculty.²⁴⁵

Effective in February, 1910, new entrance procedures were established by the University when it abolished entrance examinations. Thereafter students were to appear with what Registrar “Davy” Hoy called “clear papers.”²⁴⁶ However, the College of Agriculture planned to continue examining applicants offering credits in agriculture until the secondary instruction in that subject was sufficiently stabilized to merit certification. In 1909 one applicant offered entrance credit in agriculture; in 1910 sixteen applicants did. Of the sixteen, three passed the entrance examination.²⁴⁷

Admission of special students continued by permission of the director. There was no set program for these students, but most stayed at Cornell about two years. The more successful often transferred to the four-year program* Faculty members opposed to teaching poorly prepared students were permitted to exclude those whom they considered unable to meet the requirements of their courses.²⁴⁸ By 1906 prerequisites had been established for some courses, which had the effect of automatically excluding the special students. The faculty met this situation by recommending the establishment of special courses for these students where the regular ones were beyond their capacity.²⁴⁹ After April, 1904, the proportion of full-time students who were specials declined steadily, in part because of increasing stress on farm experience as a requirement for admission. By 1910 this requirement was a fixed policy which permitted no exceptions.²⁵⁰

Before 1911 there was no tuition in the College of Agriculture, but effective that year students from outside New York State were required to pay tuition. From 1907 to 1909 these students comprised about 27 per cent of the total student body. However, since almost all the winter course students were from New York State, the percentage of full-time students coming from outside the state was much higher. For the three-year period 1907-08 to 1909-10 they comprised

*In 1903 about 10 per cent of the special students transferred (*11th Ann. Rpt. of Pres. Schurman, 1902-1903, App. VIII*).

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about 45 per cent of the full-time students. About 9 per cent of these full-time students came from foreign countries.²⁵¹ A few years earlier the proportion of foreign students was even higher, about one in seven coming from outside the United States. In 1904-05 sixteen countries were represented in addition to the Philippines and the Hawaiian Islands. In the fall of 1906 seven students from India were enrolled.²⁵²

Admission to the winter courses continued to be by affidavit of good moral character. Professor Rice requested stricter admission requirements after one of his instructors was felled to the floor by a single blow from a student who took offense at criticism of his work. Bailey replied that increased requirements would conflict with the "general feeling" that all aspects of the winter course work should be made as simple as possible.²⁵³ (Elsewhere he admitted to liking the "rough and ready ways" of the winter course students.) In 1907 the average cost for board and other expenses for the eleven weeks' course was about \$75, although Bailey feared the rising cost of living would soon carry it to \$100. Winter course students sometimes had difficulty finding board and housing, for they came at a time of year when the more adequate accommodations were already occupied.²⁵⁴ However, familiarity with rugged rural living conditions prepared them for the less adequate boarding houses of Ithaca.

The winter courses were well advertised by the College and, in addition, were pushed by the departments offering them. In 1904 a poultry course was added to the two courses available since 1894. This was followed by a course in horticulture in 1905, and, in 1907, by a course in home economics.²⁵⁵

The short course students tended to live apart from the regular student body. Many had not been away from home before and were sometimes homesick and frequently lonesome. Beginning in 1905 organized efforts were directed toward making them feel a part of Cornell and the Ithaca community. A twenty-page handbook was prepared containing Cornell yells and information about Ithaca churches and instructions for obtaining rooms. The "shorthorns," as the winter course students were called by the regulars, were encouraged to form athletic and other organizations during their stay in Ithaca. Some of these groups, like the James E. Rice Club, bore

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the name of the department head. There was also a Bailey Club. The Fletcher Club met weekly, always concluding its session with:

Cornell, we yell

We work we strive,

Fletcher Club, Fletcher Club

1905!²⁵⁶

All the winter course clubs met monthly, a time when Cornell yells were yelled and Cornell songs were sung. There was also skating on Beebe Lake and perhaps a dance or two. One winter course student recalled that "many of the fellows said it was the best time of their lives."²⁵⁷ Former President White thought all this was to the good. "These shorthorns," he stated, "are having a happy influence in improving the other breeds in our great herd."²⁵⁸

After the winter course students completed their work, they tended to lose contact with the College. To overcome the effects of physical dispersion, considerable effort was invested in developing a sense of group identity. Composite pictures were made of the students in each short course, and Professor Tuck promoted the election of a permanent life secretary by each group who would keep in touch with the College.²⁵⁹ Bailey was anxious to bring the winter course students, the members of the reading course clubs, and the Experimenters' League into a single organization.

In 1909 there were fourteen student organizations in the College of Agriculture in addition to those of the winter students. By 1904 a Poultry Club had been organized, and in 1907 the Synopsis Club was formed for those interested in plant breeding. In March of that year the Round-Up Club, a group interested in animal husbandry, was organized at the home of Professor Wing, the name being suggested by Mrs. Wing.²⁶⁰ Misses Rose and Van Rensselaer took the lead in organizing the agricultural college girls into Frigga Flyge—the followers of Frigg, who as wife of the supreme Anglo-Saxon god Woden was the bringer of rich harvests.²⁶¹ The College also had a Glee Club, a Mandolin Club, and a number of athletic teams. (Cornell track coach "Jack" Moakley eagerly watched the agricultural enrollment increase in anticipation of a substantial amount of "healthy farm-reared athletic material.")²⁶²

To assure that these student activities would be "guided by a sym-

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pathetic man" responsible to the college administration, Bailey placed Albert R. Mann in direct charge of student affairs.²⁶³ His duties also involved developing an alumni organization. A major campaign to secure additional buildings was planned for the winter of 1910, and Bailey wanted the former students to play an effective part. During Farmer' Week of 1909 a rudimentary association of students and alumni was formed with Jared Van Wagenen, Jr., as president.²⁶⁴ Bailey wrote to other colleges to learn how their students and former students were organized, and at a meeting on February 9, 1910, the organization of the Students Association of the New York State College of Agriculture was perfected.²⁶⁵

Bailey was impressed with the importance of high student morale and considered the student organizations an important factor in its development. To maintain a student publication, he allocated \$500 annually; this sum, he informed the editor, was not a subsidy but a business arrangement by which the *Cornell Countryman* printed a college advertisement and provided copies for distribution to the high schools of the state.²⁶⁶ In his own relation to the students Bailey played the role of benevolent parent. It was a role compatible with his other interests and activities and one which was made comfortable for the students by his great prestige, romantic flair, skill with language, and basic humanism.

This role became more difficult to maintain as the number of students increased. The biweekly college assemblies had been an important vehicle for informal contacts between Bailey and the students, but as time passed these contacts became more and more impersonal. In 1910 the assemblies ceased to be social occasions when it became physically impossible to continue the serving of refreshments.²⁶⁷ The administration gradually lost the contact with student opinion necessary for the planned development of that opinion. In 1909 Mann tried to head off a student petition demanding that the director give them more attention.²⁶⁸ The petition was both a compliment to the position Bailey had achieved in relation to students and an indicator of the difficulty he would have in maintaining this position in the future.

Taken as a whole, however, the morale of the student body during this decade was excellent. The establishment of the College in new

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buildings, the selection of a new faculty led by a new dean with great dramatic talent, and the establishment of new departments gave students the feeling of participating in the beginning of a great adventure. This was especially true of students associated with Professor Rice. In 1904 Bailey could allot only \$600 for the construction of a building to house the poultry department while the lowest price a contractor would accept was \$1,800. The students took matters in hand; made the excavation, laid the foundation, and erected the superstructure with lumber taken from the old Carnegie filtration plant, which they razed for the purpose.²⁶⁹ Such dedication and identification with the success of the College enabled agricultural students to resist that time-honored snobbery which declared their social status inferior to that of other students. So great was their confidence in this regard that the *Cornell Countryman* could optimistically declare that the old prejudice "has to all appearances now passed away."²⁷⁰

What happened to students after graduation continued to receive attention, for the old issue of whether attendance at an agricultural college educated students away from the farm was still much debated. The persistence of this concern about the graduates of agricultural colleges was rather remarkable, since a parallel situation did not develop with comparable intensity concerning the graduates of other professional colleges. Replies from alumni to questionnaires distributed by the College indicated little change at this time in the ratio of graduates who were engaged in "practical agriculture" to those connected with agricultural colleges and experiment stations.²⁷¹ Bailey hoped to liberate the College from the need to justify its existence in terms of the number of farmers it was training. The purpose of the College, he declared on numerous occasions, was not to train farmers but to provide a broad education through agricultural subjects.²⁷²

Little financial aid was available to students in the College of Agriculture. Before 1906 the only scholarship was shared with the Veterinary College. This situation was somewhat relieved by Dr. C. H. Roberts' unexpected gift of \$30,000 for the endowment of scholarships in the College. The gift, which Bailey considered the first for this purpose in any college of agriculture, was all the more remarkable since it came from one who had no connection with Cornell Uni-

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versity.²⁷³ One of the Roberts scholarships aided Carl E. Ladd '11, later dean of the College of Agriculture.²⁷⁴ The only other scholarships were those provided by the New York State Grange for winter course students; in 1910 these were increased from six to twelve.²⁷⁵

The industrial fellowship provided a source of financial assistance for graduate students. This form of fellowship was developed at Cornell by Professor Whetzel following a pattern pioneered in Kansas. Funds were provided by corporations, and in a few cases by individuals, to support research in which they were interested. The first industrial fellowship was established by the Niagara Sprayer Company in July, 1909, after the company admitted, in response to queries from the College, that it could not support the claims it was making for its products.²⁷⁶ In October, 1909, a second fellowship was established in plant pathology by the nursery firm of C. W. Stewart and Company.²⁷⁷ Professor Whetzel wished to publicize these fellowships, but Webber favored caution until the "correct principle" was established. He had been surprised when the sponsor of the first fellowship used the reports made by the investigator in what he called "rather glaring advertisements." In negotiating the third such fellowship with Davey Tree Expert Company, Webber inserted a provision that reports made under the fellowship were not to be used for advertising purposes.²⁷⁸

By decreasing the dependence of the College on legislative appropriations, the industrial fellowship introduced an element of flexibility into administration. The investigations pursued under these fellowships were under the control of the College and could, in some cases, be used to support studies aimed at discovering fundamental principles independent of the immediate needs of the day. This was the kind of research Bailey favored but which, in order to obtain the support of the farmer constituency, was usually subordinated to research problems that would produce immediate technical applications.²⁷⁹ The industrial fellowship, of course, posed the same temptation to an individual or department to modify research activities in order to secure a particular fellowship.

CAMPAIGN FOR EXPANSION

In the fall of 1909 a major campaign was undertaken to expand the

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facilities of the College of Agriculture. In October the New York State Association for the Promotion of Agricultural Education and Research, then representing eighteen agricultural organizations, appointed a special committee in connection with the campaign.²⁸⁰ In November, Webber asked each department to make "conservative and reasonable" plans for expansion over the next ten years on the basis of anticipating 3,500 students at the end of the decade. In December, after the Board of Trustees authorized the College to complete plans for the proposed expansion, Webber made a rapid trip through the Midwest to determine which agricultural colleges had superior facilities and to collect other information that could eventually be submitted to the legislature. "This is," declared Webber, "the most important work I have ever had to handle."²⁸¹

The trustees appointed by the Governor played an active part in preparing the plans for expansion and placing them before the legislature. By January, 1910, they had approved a substantial booklet which considered the needs of both the Veterinary College and College of Agriculture. In it a description of overcrowded conditions was followed by a detailed statement of building requirements. The immediate needs of the College of Agriculture, it was estimated, would cost the state \$1,158,000.²⁸² To bring this figure into accord with the immediately attainable, it was decided to press for a poultry building, a home economics building, and an auditorium for the College of Agriculture. With the funds requested for maintenance, the University was asking the state for over a half-million dollars for this College alone.

In many ways the outlook was hopeful. The agricultural organizations were generally united in their support for the ten-year plan, and the members of the faculty were in close touch with these organizations. In 1909 Professor Rice was president of the New York State branch of the American Poultry Association and Professor Wing was president of the State Dairyman's Association. Both the poultrymen and the womens' organizations were prepared to support their particular buildings. There were only two open sources of opposition, a group of legislators who wished to establish another agricultural college in eastern New York and the Onondaga County Pomona Grange.²⁸³ The opposition of this Grange, which was given

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circular form and distributed to other Granges, caused more embarrassment to the officers of the State Grange than harm to the College of Agriculture.²⁸⁴ The New York State Canners Association, which ordinarily supported the development of the College, was not active because it had its own claims on the legislature, which it did not wish to diminish through open support of the college appropriations.²⁸⁵

The legislative hearing on the Cornell appropriations was scheduled for April 5, 1910. Webber organized this with great care and planned to follow it up with a letter-writing campaign.²⁸⁶ Thirty-six people spoke, including the president of the New York Central Railroad and State Trustee John Carlisle, who was a member of the State Public Service Commission. Bailey, Webber, and Schurman stressed what the midwestern states had done for their agricultural colleges.²⁸⁷ The hearing was most successful and was said by those present to have been greatly superior to that held on the establishment of the State College of Agriculture in 1904. Naturally, Webber was greatly pleased.²⁸⁸ The legislature committed the state to erecting the three buildings at a cost of \$357,000, of which \$200,000 was made immediately available. The appropriation for maintenance and operation was raised from \$185,000 to \$212,000.*

An interesting sidelight to the hearing occurred in Madison County, where the state's policy of concentrating its college-level agricultural education at Cornell was used as an issue in a local election. The *Oneida Dispatch* published an editorial charging that the "Cornell System" with its "aristocratic and expensive methods" was trying to restrict the usefulness of the Morrisville School of Agriculture.²⁸⁹ The charges — remarkably close to the position of the Onondaga Pomona Grange — were completely without foundation.† Such attacks were a natural outcome of the existing statutory relationships between the schools of agriculture and the College. As long as these schools continued to be independently administered, the statutory

**Laws of New York*, 1910, ch. 530. The plan for the development of the College is specifically mentioned in this legislation.

†The correspondence between the officials of the school and Bailey, Webber, and Pearson indicates a cooperative relationship, with Director Helyar of Morrisville expanding the services of his institution with the aid of the College of Agriculture (Bailey Papers).

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limitations on their development could be used as a basis for self-serving attacks on the College of Agriculture.

It was soon recognized that the ten-year plan submitted to the legislature had built-in limitations. While the plan had the apparent advantage of committing the legislature to future appropriations within its scope, it left in limbo aspects of agricultural education that had not been included. The problem, however, was not insurmountable where the omitted aspects were of concern to organized groups in the state. This was the case with the commercial florists, who set out, with the cooperation of Professor Craig, to secure an appropriation of \$50,000 independent of university authorities for the construction of greenhouses.²⁹⁰

The passage of the legislation for the new buildings resulted in reopening the conflict between the college administration and the university trustees. At issue was the ultimate development of the agricultural campus, which would be largely determined by the location of the three buildings authorized by the legislature. One area of contention was the land in front of the existing college buildings. Part of the university farm in 1902, it had since been transformed into athletic fields by the University. Bailey wished to use this land for building sites and for adjacent outdoor laboratories and gardens.²⁹¹ This issue was settled to the desire of the trustees with one exception. That was Bailey's plan to use the east end of the athletic field as a site for a group of animal husbandry buildings. Under the pressure of the state trustees, the board reserved the area for that purpose.²⁹² Of all the events of the year, wrote Professor Roberts from California, "the thing which gives most *satisfaction* is the fact that the College of Agriculture by reason of its great power and usefulness, has forced the trustees to restore some of their plunder."²⁹³

RELATIONS WITH OTHER COLLEGES

A blend of cooperation and competition characterized the relation of the College to other agricultural colleges. Scientific information was, of course, constantly exchanged by published bulletins and private correspondence. Aid in securing appropriations was also given and received. In 1904 Dean Henry sketched for Governor Odell the benefits that would flow to New York after establishing a state college

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of agriculture at Cornell. In 1909 Webber visited other colleges to collect information of potential value in the New York legislature. In the fall of 1910, at the request of Dean Davenport, Webber spoke in Illinois on the recent campaign in New York, which Davenport considered the crucial breakthrough in opening the way for enlarged colleges of agriculture in the United States. "You will never know," he wrote Webber later, "how much good you did us with your address."²⁹⁴ In November, 1910, Davenport brought eight prominent Illinois farmers to visit Cornell. In reporting to his board of trustees, he used Cornell "as a buffer to show how far behind Illinois is getting."²⁹⁵ At the same time Webber regarded Illinois and Wisconsin as the "great competitors" of the College and reported to Schurman that "we are in the lead in some respects without question but in other regards it seems they are ahead of us." The following year Webber noted that the College had the largest faculty of any college of agriculture in the country and nearly as many graduate students as all the rest of the other agricultural colleges in the United States combined. With the developing agricultural colleges in the Far West looking to Cornell for leadership, Webber was anxious to maintain the position Cornell had gained.²⁹⁶

"I believe that when agricultural institutions are seeking men, more of them look toward Cornell University than anywhere else," declared Director L. A. Clinton of the Storrs, Connecticut, Experiment Station.²⁹⁷ This judgment is supported by hundreds of letters to Bailey asking him to recommend candidates for available positions. With colleges of agriculture rapidly expanding their curriculum following the lead of Cornell, the demand for qualified candidates for faculty positions was much greater than the supply. At one point in 1907, Bailey thought he could place twenty men if he had them.²⁹⁸

In 1910 the element of competition with another institution provided the vital factor in establishing a department of forestry in the College of Agriculture. Bailey, of course, had long favored such a step, and by 1909 Schurman was ready to proceed, pending the outcome of litigation over the lumbering contracts of the former College of Forestry.²⁹⁹ In the College of Agriculture budget for 1910 a provision was included for a professor of forestry. Meanwhile, however, Chancellor Day had been seeking, with the active assistance of three

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state senators, a branch of education which might be supported by the state at Syracuse University. After surveying the educational activities and commitments of the state, forestry was selected.³⁰⁰ In March, 1910, a bill was introduced in the legislature to establish a state college of forestry at Syracuse University. Webber indicated his reaction in a memo for Bailey:

Cornell is not now in position to fight such a bill. Doubtless no action will be taken at the present legislature. It seems to me that the only way to checkmate this move is for us to immediately establish a Department of Forestry and get the best man available to take charge of the department. The advertising which this would give us, and possibly the utilization of this man largely at first in connection with the extension work on the farms would show that this matter was well underway. I am looking up a man.³⁰¹

Webber had not succeeded in finding this man by the time Bailey returned in the summer of 1910.³⁰² When the trustees later used for other purposes the funds set aside for forestry, Bailey thought the College had "completely lost out." Schurman, however, had forgotten about the lack of funds and secured Walter Mulford as professor of forestry.³⁰³

ALBERT R. MANN AND GEORGE F. WARREN

Two members of the faculty underwent unusual metamorphoses during the decade after 1900 which prepared them for future leadership roles. Lacking funds for the regular course, Albert R. Mann entered as a special student in 1901, but later was persuaded by George F. Warren, then a graduate student, to complete the course, which Mann did by taking a heavier schedule and by earning extra money working as a milk tester for Professor Wing.³⁰⁴ As a senior in 1904, Mann took an especially active part in class affairs. After graduation he spent a year at the Farm School for destitute boys on Thompson's Island in Boston. In 1905 Bailey persuaded Mann to return to Ithaca as his personal secretary to help prepare the *Cyclopedia of American Agriculture*.³⁰⁵ In 1908 Mann was appointed assistant professor of dairy industry to handle Professor Pearson's office work. Five months later Mann resigned to follow Pearson to Albany as private secretary.³⁰⁶ By March, 1909, he was back at the

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College as secretary to the director, handling the routine office work and providing student guidance. Mann's responsibilities were then substantial, for Bailey spent much time away from the College attending hearings of the Country Life Commission. These responsibilities did not decrease the following year, since Webber's multiple roles as director, head of the Department of Plant Breeding, and advisor to twenty-one graduate students did not permit him to do more than the most important of the director's duties.³⁰⁷ In 1910 Mann was given a professorship in agricultural editing, in addition to his titles of secretary and registrar of the College, so that he could participate in meetings of the University Faculty.³⁰⁸ The title of professor involved no additional duties, for he had been editing the college publications since his return to Cornell. Mann was also active in relating the College of Agriculture to the social work of the rural church.³⁰⁹ This was an area of activity Bailey considered important but in which he did not feel entirely comfortable.

George F. Warren came to Cornell as a graduate student after teaching mathematics for five years in the high schools of Nebraska. He studied with Bailey, specializing in horticulture. In 1903, equipped with camera, notebook, and bicycle, he began an apple orchard survey of Wayne County to determine the conditions related to successful apple production. The following year he made a similar survey of Orleans County. Through the use of statistical methods, Warren segregated the more significant production factors from the experience of individual farmers and, in the course of the two studies, found that current recommendations for success in apple production needed reexamination.³¹⁰ His methods also made it possible to determine the normal conditions of production, thereby establishing a standard with which an individual orchard could be compared.

After receiving his Ph.D. in 1905, Warren was for a year horticulturist at the New Jersey Experiment Station. He then returned to Cornell as assistant professor of agronomy and in 1907 became head of the new Department of Farm Crops. This department included a professorship of farm management, at the time unfilled by agreement between Warren and Bailey.³¹¹ One of the most noticeable of Warren's qualities as a teacher was his ability to attract graduate students. In 1908 ten of the forty-three graduate students in the College were

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working with him.³¹² During their stay at Cornell he encouraged high-quality work and on their graduation made substantial efforts to place them in desirable positions. In 1910, when the graduate students were not up to his high standards, he wrote with characteristic terseness at the bottom of Mann's letter requesting recommendations for fellowships, "No recommendations — a poor lot."³¹³

Warren's ambition and talent for administration made Bailey wonder how long it would be possible to keep him at Cornell. In 1908, when Warren held two offers from other institutions, Bailey agreed to promote him to full professor and assign to him the work in farm management.³¹⁴ Nearly twenty years later Warren reflected on the circumstances which led him away from the experimental work in farm crops to concentrate on farm management:

I began Farm Management work because I had too little money to do anything else. Undoubtedly I would be in the Farm Crops field at the present time had it not been for the very limited funds. In the first year when I was professor of Farm Crops and also had Farm Management, my total budget was \$500 for all purposes. I could not employ a stenographer to say nothing of doing field experiment work. Therefore, I went into the Farm Management field.*

This decision had the effect of placing him in an educational environment different from that of most of his colleagues, for where they were engaged in the intensive exploration of a narrow area of agricultural science, he was involved in synthesizing the information they produced. Professor Mann, through association with Bailey and Pearson and involvement in the administration of the College, was also acquiring a broad view of agricultural education. During the decade both Mann and Warren went through the process of selecting from their knowledge of agriculture the information they thought most pertinent for a beginning student of the subject.†

Along with George Lauman, who in 1909 was appointed head of

*The agricultural survey of Tompkins County published in 1911, Warren stated, did not cost the College of Agriculture more than \$1,500 (Warren to James Rice, March 26, 1926, Rice Papers).

†It is interesting to compare the two books, both published in Bailey's "Rural Text-book Series" (A. R. Mann, *Beginnings in Agriculture* [New York, 1911]; G. F. Warren, *Elements of Agriculture* [New York, 1909]).

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an independent Department of Rural Economy, Warren helped compensate for the compartmentalization of agricultural knowledge following the proliferation of courses in the College. The student, faced with a broad range of choices, was forced to select a program on the basis of the advice he could secure and, having chosen, was faced with the difficult task of composing seemingly unrelated information into a unified body of knowledge. Bailey attached great importance to the unifying function of the Departments of Farm Management and Rural Economy. The former he expected to tie together the business organization of the farm, while the latter integrated information relating to rural citizenship.³¹⁵

By developing the survey method into an instrument for determining what factors were related to success in agriculture, Warren filled a gap in agricultural education which Bailey had long stressed. The agricultural survey of Tompkins County, which Warren took over from Professor Hunt in 1907, was, in Bailey's opinion, one of the great contributions of the College.³¹⁶ To expand survey work Bailey planned to use half of the \$10,000 extension fund appropriated by the state in 1908. A soil survey in cooperation with the United States Department of Agriculture was projected for Livingston and Montgomery Counties, a pomological survey of Ontario and Monroe Counties was projected along the lines already laid out in Orange County, and a truck gardening survey of Long Island was planned.³¹⁷

PUBLICATIONS

By 1907 Bailey had departed from his earlier position of not expecting research from faculty members paid from state funds. That year and regularly thereafter he exhorted all members of the faculty to get the results of research in shape for publication.³¹⁸ Each department, he said in 1908, should produce at least two bulletins a year.³¹⁹ In 1909 he noted that in the entire College only about nine bulletins a year were being prepared, although with much smaller staff and appropriation about twelve had been published each year from 1887 to 1904. Some of the best research, he noted, had been conducted on a very modest budget. "I am afraid," he told the faculty, "that we have become so accustomed to waiting for equipment and conveniences

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that we are in danger of losing our power of making the most of our opportunities.”³²⁰ Publications not immediately related to research, primarily reading course and nature study material, accounted for about half of the total number of pages prepared for publication during the first ten years of the century.

Until Mann took up the work in 1909, Bailey acted as editor of all college publications. This may have some bearing on why so few experiment station bulletins were submitted, for his prejudice against poor scholarship was well known. Certainly many of the bulletins submitted to Mann required extensive revision. Errors in tabular material were so frequent that Mann regularly sought the assistance of Professor H. H. Love in checking calculations.³²¹ Even transferring the costs of correcting these errors to the departments responsible did not cure the difficulty, for poorly written and inaccurate bulletins continued to reach the desk of Professor Mann.³²² To him must go a substantial part of the credit for maintaining the quality of the Cornell University Experiment Station bulletins during the years he served as editor.