

A PUBLIC COLLEGE AS THE GARDEN OF EDEN: THE EARLY YEARS OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

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I

The patterns of state aid to the institutions of higher learning in mid-19th century Massachusetts show a few salient characteristics. First, as argued by John S. Whitehead, a few decades to 1859 witnessed estrangement between the Colleges and the State, and, as a consequence, the latter ceased to give aid to the former. Around the mid-century, the colleges with stronger sectarian backgrounds such as Amherst, Williams, and Tufts received state grants when Harvard, despite her expanding enrollment and the prospering (in relative terms, at least) Lawrence Scientific School, failed to do so.⁽¹⁾ As shown in Table I, however, the State's munificence to these Colleges proved temporal and sporadic.

Second, for about a decade starting from 1859 and 1864 respectively the State of Massachusetts consistently aided two scientific institutions: the Museum of Comparative Zoology and the Massachusetts Agricultural College. As for the former, the present author has shown elsewhere how the Museum had functioned as the capstone of the State system of public education through its activities of collecting and classifying specimens from all over the world, and of disseminating "scientific" discoveries on orders in nature to public school teachers who trained the next generation.⁽²⁾ In the current essay the author will explicate how the Massachusetts Agricultural

College, along with the Museum, received ample support from the Commonwealth during the early years of its existence. In doing so he shows that the College represented what he calls the "religious-scientific institutions" in mid-19th century Massachusetts.

Table I: State aid to Institutions of Higher Learning in Massachusetts, 1806-1879

1806	Harvard	\$30,000				
1814-1823	Harvard	\$100,000	Williams	\$30,000		
1847					Amherst	\$25,000
1859	M.C.Z.	\$100,000	Williams	\$25,000	Amherst	\$25,000
					Tufts	\$50,000
1861	M.C.Z.	\$20,000				
1863	M.C.Z.	\$10,000				
1864	M.C.Z.	\$12,208			M.A.C.	\$10,000
1865					M.A.C.	\$10,000
1867	M.C.Z.	\$10,000				
1868	M.C.Z.	\$75,000	Williams	\$75,000	M.A.C.	\$50,000
1869			W.P.I.	\$50,000	M.A.C.	\$50,000
1870					M.A.C.	\$25,000
1871	M.C.Z.	\$50,000			M.A.C.	\$50,000
			M.I.T.	(\$47,192)**		(\$94,383)**
1873	M.C.Z.	\$25,000				
1874	M.C.Z.	\$50,000			M.A.C.	\$18,000
1876					M.A.C.	\$5,000
1877					M.A.C.	\$5,000
1879					M.A.C.	\$32,000

* M.C.Z., M.A.C., W.P.I., and M.I.T. stand for the Museum of Comparative Zoology, the Massachusetts Agricultural College, the Worcester Polytechnic Institute, and the Massachusetts Institute of Technology, of which the W.P.I. was then called the Worcester County Free Institute of Industrial Science.

** These figures refer to the additions made by the State in 1871 to the Morrill grant funds which had been allotted to the MIT and the MAC respectively.

II

Was the kind of aid extended by the State to the MAC really exceptional? If so, how? The question seems vital because many of the other States that had accepted the Federal offer of 1862 "have spontaneously aided the colleges by furnishing necessary buildings, and also by very liberal annual appropriation."⁽³⁾ In New England alone, according to Justin S. Morrill, New Hampshire had made by 1887 appropriations amounting to \$54,000, and Maine had granted in aid by the same year the total sum of \$247,218.⁽⁴⁾ Other New England States apparently did not show similar munificence to their Land-Grant colleges.⁽⁵⁾ Of New Hampshire and Maine the latter more resembled Massachusetts. Maine established and maintained an institution separate from the existing colleges in the State. Besides, she received land scrip two-thirds in amount of that for Massachusetts, the second largest in New England.⁽⁶⁾ Thus we should duly compare the two States to see if the pattern of aid to the MAC by the State of Massachusetts was really exceptional.

On receiving the Federal land-grant, the governors of Massachusetts and of Maine knew well that the income accruing therefrom, by itself, could hardly sustain a collegiate institution in each of the States. Governor John A. Andrew of Massachusetts proposed a consolidation of various institutions, including an Agricultural College, into a grand system of higher education.⁽⁷⁾ Similarly, the two Maine governors, Coburn and Cony, had consistently favored a connection of a Land-Grant institution with one of the existing colleges in the State.⁽⁸⁾ In both States, the Boards of Agriculture firmly opposed any consolidation or connection. They caused the creation of one (in case of Maine) or two independent Land-Grant colleges in these States.⁽⁹⁾ Thus, in spite of the Governors' initial determination otherwise, Massachusetts ultimately founded an Agricultural College in Amherst and Maine established a State College of Agriculture and Mechanic

Arts in Orono.

As shown in Table II, Maine amply aided the State College in Orono during the first decade of its existence. How did these figures compare with those for the MAC? The general pattern here resembled that of Massachusetts. However, there were a few differences as well. First, the State of Massachusetts had appropriated one-tenth of the Morrill grant for the purchase of lands for the Agricultural College. Moreover, at its inception, the MAC could expect from the town of Amherst, its location, a \$75,000 fund, a sum originally calculated for a Massachusetts School of Agriculture to be founded in Springfield in 1860.⁽¹⁰⁾ The Maine State College of Agriculture and the Mechanic Arts (hereafter referred to as MSCAM) could hope to receive from the towns of Bangor and Orono less than one-third that amount, half of which was set aside for the purchase of lands.⁽¹¹⁾ This made it imperative for the early MSCAM to rely upon the State financially.

Table II: State aid to the Maine State College of Agriculture and the Mechanic Arts, 1868 – 1877

1868	\$10,000
1870	\$50,000
1873	\$24,000
1874	\$12,500
1875	\$10,000
1876	\$8,000
1877	\$15,218

*See Lyndon Oak, "Historical Address," in the MSCAM, *Dedication of Coburn Hall*, (n.p. 1888), pp. 24-25 and 28

During its first ten years, the MAC received from Massachusetts more than two-hundred thousand dollars as grant in aid. This did not include an additional ninety-four thousand dollar fund which the State appropriated to

augment the MAC's endowment. During a similar period, the MSCAM received from the State of Maine about one hundred and thirty thousand dollars. While the amount of scrip allotted to the two institutions roughly equalled, the MAC enjoyed more than twice as much State aid than did the MSCAM. Moreover, the MAC received this much when she taught, and did research in, agriculture alone, unlike the MSCAM which was comprised of both agriculture and the mechanic arts. Massachusetts relegated the latter to the Institute of Technology in Boston. As shown in Table I, except for the augmentation of the Morrill fund, the State appropriated virtually nothing for the early Institute, while it amply aided the MAC.⁽¹²⁾ Massachusetts encouraged the MAC for farmers who made up only 13 percent of her working population, and it neglected the MIT which was intended for the industrial class, the majority of the State population.⁽¹³⁾ The author will argue, then, that the State's munificence to the MAC indicated the degree of her unusual commitment to agricultural education vis-à-vis mechanic one, in comparison with Maine which, among other New England States, was liberal to her Land-Grant college.

When seen against the vicissitude of the student enrollment in the early MAC, the State's aid to the College, at the neglect of the MIT, stands out. Table III shows the number of freshmen at the MAC, the MIT, and Harvard College for about a decade leading to 1875. A few things may be noted.

Table III: Number of Freshmen in the Three Institutions

	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875
M.A.C.			56	40	23	31	39	34	20	26	18
(In-State)			(54)	(36)	(14)	(14)	(28)	(26)	(15)	(21)	(13)
M.I.T.		64	64	76	89	91	111	131	98	41	80
Harvard C.	126	125	156	128	148	189	194	176	217	197	252

Sources: The Massachusetts Agricultural College. *The Index; Catalogues* of the Massachusetts Institute of Technology and of Harvard University.

First, no one can fail to notice that the freshmen enrollment at the MAC deteriorated. The trend was especially notable for the first few years among her in-State students. Exactly the opposite case applied to the early years of the MIT. The soaring figures might have impressed the contemporary that its enrollment would even overtake that of Harvard College which, in its own turn, increasingly attracted more freshmen each year. By the side of the ever growing freshmen at the MIT and Harvard College, the size of the MAC freshmen dwindled. Those who were sympathetic with the former could duly rebuke President William S. Clark's assertion on the MAC as "the People College" by saying: "It may be so, but it in fact is a very few people's college." Why did the State of Massachusetts extend her aid to the early MAC which was intended, from the beginning, for a small minority of agricultural population, and which could hardly meet the State's expectations on student enrollment? In other words, what was especially "public" about the MAC, an asset which offset its weakness against the growing MIT and Harvard College? Thus, in the following, the author will trace the early history of the MAC with special reference to its unique educational role in the State during the few decades after the foundation.

III

As an MAC historian stated, the Agricultural College was peculiar in having "three presidents before it had any students."⁽¹⁴⁾ This in turn reflected conflicts over the basic educational policy on the initial construction of the MAC. Concerning a few vital points, Henry F. French, the first President, on the one hand, and Paul A. Chadbourne and William S. Clark, the second and third presidents, on the other, held different ideas. French's unavailing struggles during the two years as President, as well as his ultimate resignation, largely stemmed from divergences of opinion with the Board of Trustees on the purposes of the proposed College.⁽¹⁵⁾ Nowhere were these

differences manifested more clearly than in the plans of first buildings. Unlike some Trustees who had insisted on a monumental structure, French proposed only those structures which were essential from the point of view of practical, agricultural education. This policy of economy derived in part from the limited resources for construction, the \$75,000 contribution from the town of Amherst. But his plans simultaneously reflected his educational ideas. In 1866 French proposed the construction of the buildings of the MAC which were comprised of the following:⁽¹⁶⁾

Building #1	1st Story	(a) Two lecture rooms (b) Two rooms for profs.
	2nd Story	The same
Building #2	1st Story	(a) Chemical lab. and lecture room (b) Professor's room, Janitor's room, etc.
	2nd Story	(a) Museum (b) Special cabinets and offices
Building #3	1st Story	(a) Reading room, drawing, writing and study rooms for students (b) Packing room, etc.
	2nd Story	(a) Library (b) Librarian's room and staircase
Building #4	1st Story	(a) Gymnasium and drill room (b) Armory, etc.
	2nd Story	(a) General assembly hall (b) Offices and board room

French's plans apparently aimed at the efficient prosecution of an agricultural education. They included the major elements indispensable for that purpose, at the neglect of others, notably dormitories for students. Contrary to what a few historians stated, French had not received a collegiate education aside from one year of training at Harvard Law School.⁽¹⁷⁾ Partly because of this personal history, perhaps, French was not fascinated by, and

even antagonistic to, the idea of accommodating students in dormitories for agricultural training. To some of the Trustees who had favored a monumental structure such an approach seemed inadequate. In the face of opposition from this group, French communicated his embarrassment to President Asa D. Smith of Dartmouth College, saying: "I am by no means sure that we should not do more for both agriculture and education by a special school of agriculture, without attempting a general course of instruction, but such seemed not to be the ideas of our board or of the public."⁽¹⁸⁾ As the present author argued elsewhere, those most committed to locate the MAC in Amherst had envisaged its close relations with Amherst College.⁽¹⁹⁾ With its emphasis upon merely practical training, French's MAC would almost ruin this original purpose of the Agricultural College in Amherst, a circumstance which decisively prevented French from accomplishing anything substantial for the initial organization of the MAC. When the Trustees' wish to build "dormitories in the style of the old colleges" ultimately surfaced and stood in the way to his plans, French had no other choice than to tender his resignation.⁽²⁰⁾

To those Trustees who disagreed with French, Paul A. Chadbourne must have been "a wonderful man." A graduate of Williams College and currently its professor of chemistry and of natural history, Chadbourne was a genuine collegian and a versatile man: he was a "scholar, a philosopher, a scientist, a Christian minister, and a teacher."⁽²¹⁾ In contrast to French, Chadbourne would render the proposed MAC closer to a traditional college. As for purposes of education, he reversed the order of priority by relegating the training of practical agriculturists to a position subsidiary to a liberal education. For a thorough training of agriculturists, the MAC would need two courses: a special course for agriculture, and a regular four years' course of study, or "truly liberal education."⁽²²⁾ The core of its faculty would teach the latter, while agriculturists would be invited, from time to time, to give lectures in the former. As could be expected, with emphasis

upon the latter's mineralogical and geological cabinets. But did the MAC have anything to offer in return? In the 1867 MAC Annual Report, Chadbourne stated that, while receiving benefit, "a full return will be made to Amherst College in the Botanic Garden and other scientific facilities."⁽²⁶⁾ Indeed, behind the Botanic Garden idea lay a central ideology which promoted the founding of the MAC as an independent agricultural institution. Immediately prior to his appointment as president, Chadbourne had an occasion to expound his thoughts on the vocation of agriculture before agriculturists of the State. Drawing upon the description in the Book of Genesis, he interpreted that, upon Adam's creation as a farmer, God "presented him at once a 'model farm.'" Given this original relation between God and man, man should strive to restore "that blissful state which Adam enjoyed in *Paradise*." More specifically, it would be the great effort of agriculturists to approximate this earth "to that only perfect model farm — the Garden of Eden."⁽²⁷⁾ Similarly, Clark singled out the proposed Botanic Garden as "one of the most attractive as well as instructive features" of the MAC, and he characterized agriculture as "the delightful occupation of Eden."⁽²⁸⁾ In placing emphasis on the Garden, Clark did not simply follow in the steps of his predecessor. His interests in fact dated back to his conversion-like experience in London in the early 1850s en route to Göttingen when he switched his goals from seeking fortune in mining to creating "a botanic garden in the United States."⁽²⁹⁾ Thus Chadbourne and Clark fully shared the belief that the MAC should ultimately become the Garden of Eden, rather than a merely scientific and experimental agricultural college. Though primarily oriented toward an agricultural education, the MAC intended simultaneously to replace the traditional colleges in showing the next generation the peculiar role of agriculture in regaining the moral backbone of the State.

IV

With the first buildings thus completed, the MAC could properly accommodate in its dormitory forty-seven of the first fifty six students. But President Clark already had to think about the following year. If another fifty applicants appeared, for instance, the MAC would need one more dormitory, a boarding house, etc. But she had used up the \$75,000 from Amherst as well as the \$20,000 from the State. Would not the Commonwealth grant in aid \$50,000 in 1868 for the dormitory for prospective fifty students?⁽³⁰⁾

The State legislature replied Clark's request by granting in aid the full amount to the Agricultural College. With the \$50,000 thus given, Clark built the second dormitory, the South College, a boarding house and a few barns. The two dormitories could now accommodate 128 students.⁽³¹⁾ Contrary to Clark's expectations, however, the number of entrants for 1868 sharply declined. Only forty freshmen enrolled, making the total enrollment barely ninety.⁽³²⁾ Given the open space thus created for another thirty-six students, Clark apparently found it unwise to apply in 1869 for a State aid for the third dormitory. Thereupon, he proposed the construction of eight buildings including a gymnasium, a public building, and a president house, all at an estimated cost of \$100,000.⁽³³⁾ Clark's requests were largely met by the Commonwealth which appropriated in April 1869, half that amount. Another dismay in enrollment awaited the MAC, however. The number of freshmen for 1869 tumbled to twenty-three. Moreover, of these only fourteen came from within Massachusetts, a figure smaller than one-third of that for 1867. The MAC could not fill up the first two dormitories even with the three classes of students. Nonetheless, Clark's ideal of collegiate education did not permit him to go another year without a proposal on the third dormitory. In the 1870 Report the President stated that, to fully accommodate four regular classes by the fall of 1870, "additional

buildings, including a new dormitory, would be necessary, the cost of which would vary from \$100,000 to \$200,000, according to the number provided for.”⁽³⁴⁾

The immediate reaction on the part of the State legislature against the consecutive declines in the number of MAC entrants was negative. By the side of the dwindling Massachusetts freshmen, Clark’s plans to send back annually four graduates to each county sounded hollow. Moreover, for the same three years, the MIT and Harvard College enrolled 64, 76, and 89, and 156, 128 and 148 freshmen, respectively. Inevitably the General Court became skeptical about the MAC’s prospects. In 1870 the State gave the College only \$25,000, or half the amount she gave the year before, while Clark requested several times that amount. Furthermore, the legislature proposed to consider the separation of the MAC and the State. Chapter 75 of the 1870 State Resolves read:

the secretary of the board of education and the secretary of the board of agriculture be directed to devise a plan, if practicable, by which the college may, without expense to the Commonwealth, be recognized as an independent institution in analogy with other colleges in the Commonwealth, and that they inquire whether the term of study in said college should not be reduced.⁽³⁵⁾

In this way the General Court envisaged the withdrawal of State aid to the inchoate institution. Moreover, by reducing the MAC to a mere school, the State tried to suppress the financial demands arising from its management. For the College thus would attract more farm boys whose tuition payments, along with the income from the Federal Land-grant, could perpetuate its existence.

In reply to this legislative action, two recommendations appeared the following year. One of these came from the Committee on Agriculture of the General Court. The other was prepared, as specified in the 1870 Resolve, by the Secretaries of the Board of Education and of the Board of

Agriculture. The former was a response to the concern over the MAC expressed by Governor William Claflin in January 1871. In his quest for the cause of the decline in enrollment, Governor Claflin focused his attention upon the curricular structure of the College. He emphasized before the State legislature the need of an "impartial examination of the curriculum of studies," which would have to "convince any candid man that it is eminently calculated to meet the practical wants of the present time."⁽³⁶⁾ In response to the Governor's address, the Committee on Agriculture visited the MAC to ascertain its alleged usefulness as well as to locate the measures for its financial independence. The Committee held that their first-hand observations confirmed the basic usefulness of the College. However, the MAC would have to maintain this usefulness "with the best economy." According to the Committee, the solution lay in a few additional State appropriations. These would help shortly to double the number of students whom the current teaching staff could instruct easily. The MAC's income would increase proportionately, and she would become able to sustain herself.⁽³⁷⁾ Upon these arguments, the Committee recommended that the State pay the MAC \$50,000 for the payment of debt as well as for the erection of necessary buildings. Since this alone would end up with the request for another financial help, the Committee further suggested that the Commonwealth appropriate another \$50,000 the following year (1872) on the condition that her trustees should secure the pledge for a like sum from other sources.⁽³⁸⁾

Thus the Committee proved rather favorable to the MAC. But the Secretaries of the two Boards were even more so. While the 1870 Resolve expected a critical evaluation and diagnosis of the MAC's worth for the State, the two secretaries, Joseph White and Charles L. Flint, argued the case from a different point of view. They focused attention upon the Commonwealth's obligations in the creation of the MAC. On accepting the 1862 Morrill Grant, held White and Flint, the State had entrusted part of it to the

MIT, a newly-established independent institution. For the promotion of agriculture, the Commonwealth selected "an entirely different instrumentality." Here she established the MAC, "an institution which holds peculiar relations to the Commonwealth."⁽³⁹⁾ First, the State itself, rather than individuals with petitions, incorporated the MAC, and she exerted control upon significant aspects of its organization.⁽⁴⁰⁾ Second, with her right to fill vacancies in the Board of Trustees, the State held sway arbitrarily to discontinue the MAC.⁽⁴¹⁾ Third, the MAC Corporation, which had included the Governor and the two secretaries, further came under the control of the Governor and his council, as well as of the Board of Agriculture, with reference to important items. Finally, in selecting the site for the MAC, its Board of Trustees had to follow the condition that the town could offer \$75,000 for the construction of necessary buildings.⁽⁴²⁾ Given all this, the State should fully extend her help to establish the MAC with regards to lands, buildings, books, apparatus and teachers. Then she should provide, either by annual grants or by permanent endowment, "sufficient means in addition to the congressional fund, for its continued existence."⁽⁴³⁾ More specifically, the State had yet to provide the MAC with a few buildings, including a dormitory, the expenses for experiments in practical farming and their publication and for a few other positions to be filled. As for the annual expenses, the State had to defray the MAC's deficit from year to year, largely because the current revenue, aside from tuitions from students, consisted of the two-thirds of the interest from the \$208,425 Morrill fund which proved grossly insufficient. Since the State ultimately caused this, she should duly fill in the gaps by increasing the fund. After making good this deficiency, the State should bestow upon the MAC a status similar to that of the Institute of Technology. When the College was thus made independent, the agricultural community, in whose interest the college was established, would permanently sustain the MAC in Amherst.⁽⁴⁴⁾

Complying with the recommendations of the secretaries, the General Court amended, in May 1872, the MAC's charter and rendered its Board of Trustees self-perpetuating.⁽⁴⁵⁾ Also, in addition to \$50,000 expenses for buildings and others, the State resolved to increase the Morrill Grant fund to three hundred and fifty thousand dollars, an amount originally expected to be realized with the scrip of lands given to Massachusetts.⁽⁴⁶⁾ After all this, however, the State continually aided the MAC during the 1870s when she gave nothing to other institutions of higher learning with the exception of the Museum of Comparative Zoology. What prompted this generosity? Why did the State establish and promote the MAC for the minority, when it largely neglected the MIT which apparently represented the interests of a far larger segment of the State population? In the rest of the essay, the author will focus on a single question: how did the MAC resemble the Museum of Comparative Zoology with regards to its scientific and educational activities in mid-nineteenth century Massachusetts?

V

Immediately after the MAC's separation from the Commonwealth, Clark and his colleagues set about a scientific investigation. Being entitled a study on the circulation of sap, this was an attempt to ascertain experimentally the nature of forces which promoted the ascent of the crude sap and "the return of the so-called elaborated sap from the leaf to the root."⁽⁴⁷⁾ For this purpose, the MAC scientists applied measuring instruments to the sugar maple and other trees on campus and kept records over a few months. Behind the experiment lay a metaphysical end-in-view; namely, to refute the world view of natural philosophy where physical forces and agents predominated even with reference to the explanation of life. The MAC scientists narrowed their target upon the role of osmose as a physical force. To them, at least to Clark, the results of the experiment

seemed to show that the major actions of the circulation of sap were not caused by osmose, or any other mere physical force. Rather they derived from the "real and most wonderful power called vital force."⁽⁴⁸⁾ The entire experiment proved conclusively, so Clark believed, that life was "still a special force and not to be resolved into any other sort or combination of attractions and repulsions, whether called electricity, osmose or any other name."⁽⁴⁹⁾

As head of the research staff, Clark delivered the paper before the State Board of Agriculture meeting on December 2, 1873. The paper received favorable reactions. Special commendation came from Louis Agassiz who was present and who was destined to leave this world within a few weeks. Requesting a special permission to comment, Agassiz lavished praise upon the "scientific" tour de force by the MAC:⁽⁵⁰⁾

... I would not allow this opportunity to pass without saying a word with reference to the Agricultural College at Amherst. From this day forward that institution has its place among scientific institutions, if it had not before; for only those institutions have a place in the scientific world which do something, and this is something extraordinary; it is a revelation to physiologists. Let me say to those who have not thought that the Agricultural College was doing anything worth its expense, that the production of this one paper has amply paid for every dollar which the State has thus far bestowed upon the institution.

The dying Director of the Museum of Comparative Zoology perhaps saw in the MAC under Clark a successor. Agassiz's praise must have derived in part from expectations that the MAC continue the MCZ's work which would be left unfinished, in part at least, with the imminent disappearance of himself. In fact, Agassiz's death toward the end of December 1873 would cause the Museum to cease to be a State institution the following year.⁽⁵¹⁾

Inspired in part by Agassiz's expectations and encouragement and by

his departure, Clark decided to continue the scientific investigation for another year. This time the MAC's endeavor consisted of two parts: one was an experiment to "measure the expansive force of a growing plant," and the MAC staff recorded "the weight of iron lifted by the squash in the course of its development."⁽⁵²⁾ The study proved that the growing squash could sustain as much as 5,000 pounds of weight before it collapsed. The experiment impressed the relative strength of life vis-à-vis mere physical force and it attracted more than ten thousand visitors to the MAC campus.⁽⁵³⁾ In another experiment Clark and his colleagues elaborated what they had done the year before. They again attempted to disprove the view which assigned mere physical forces significant roles in plant life, although their conclusion this time reflected a flexible attitude toward the subject. They admitted that none could expect to exhaust the force of life, yet, to their eyes, it was none the less "important and interesting to exercise our utmost ingenuity in the effort to discover the times and modes of its operations and its relations to the other forces of Nature."⁽⁵⁴⁾

In showing the vital force separate from mere physical forces, in insisting on the relative superiority of life over inanimate physical agents, and in pointing to unchangeable orders in animate nature, the MAC under Clark was doing in biology exactly what the Museum of Comparative Zoology under Louis Agassiz was doing in zoology. The two did this after the same fashion; namely, by making scientific classifications and experiments of such a scale that no traditional college could afford to, and by serving ultimately the justification of older and decaying values. In other words, they sanctioned traditional ethical grounds through the systematic application of "authentic" scientific procedures without making recourse to old methods of authority. As such they would be appropriately called, the author believes, the "religious-scientific institutions", institutions distinctly different from both traditional colleges and new universities and institutes in post-bellum America. No wonder that the relatively old generation

represented in the General Court extended consistent aid to the two institutions, when they gave virtually nothing to other colleges and institutes.

From the point of view of a new generation, however, higher education in post-bellum Massachusetts presented different prospects. Neither the MAC nor the Museum proved popular among the younger generation. The MAC's student enrollment remained rather low throughout the period, while students went en masse, after the late 1870s, to Harvard College under Charles W. Eliot and the Institute of Technology in Boston.⁽⁵⁵⁾ One cannot but find in the early histories of the MAC and the Museum the cultural transition from one generation to the next in this area of the period. With the departure of Louis Agassiz, the Museum virtually ceased to be a State institution as envisaged by the zoologist. With its large campus in Amherst as well as a constant influx of students, though rather small in number, the MAC had but to survive. In the coming decades, the College would have to undergo a silent but drastic revolution in its educational and scientific purposes, a story that might be as exciting as that of its foundation.

ACKNOWLEDGEMENT

In preparing this essay the author received invaluable help from Mr. Michael F. Milewski of the University Archives, the University of Massachusetts-Amherst.

NOTES:

- (1) See John S. Whitehead. *The Separation of College and State*. (New Haven, 1973); Akira Tachikawa. "The Colleges and the State in Mid-Nineteenth Century Massachusetts." *Journal of the Midwest History of Education Society*, XIII (1985), 113-131.
- (2) See Akira Tachikawa. "The Founding of the Museum of Comparative Zoology in the Educational Crisis of Mid-Nineteenth Century Massachusetts." *ICU Educational Studies*, XXII (1979), 11-39.
- (3) Justin S. Morrill. "Address." In *Massachusetts Agricultural College, Commemorative Addresses, 1862-1877*. (Amherst, 1887), 24.
- (4) See Justin S. Morrill. *An Address in behalf of the University of Vermont and State Agricultural College*. (Burlington, Vt., 1888), 5.
- (5) See Frank W. Blackmar. *The History of Federal and State Aid to Higher Education in the United States*. (Washington D.C., 1890), 110, 113-14, 127-28.
- (6) See *ibid.*, 348.
- (7) See John A. Andrew. *Address . . . to the Two Branches of the Legislature of Massachusetts, January 9, 1863*. (Boston, 1863), 54.
- (8) See *Message of Governor Coburn to the Legislature of the State of Maine, January 8, 1863*. (Augusta, 1863), 14; *Address of Governor Cony to the Legislature of Maine, January 7, 1864*. (Augusta, 1864), 17-18; *Address of Governor Cony to the Legislature of the State of Maine, January 5, 1865*. (Augusta), 1865, 22-23.
- (9) See *Report of the Joint Special Committee on the Grant of Congress for Colleges in Agriculture and Mechanic Arts*. (Massachusetts Senate Document—No. 108, March 1863), 18; *Tenth Annual Report of the Superintendent of Common Schools of Maine*. (December 1863), 33.
- (10) See Marquis F. Dickinson. *The Beginning of College History*. (Boston, 1908), 11.
- (11) See Blackmar. *op. cit.*, 122.
- (12) Cf. *Petition for Aid from the Massachusetts Institute of Technology*. (Massachusetts Senate Document—No. 77, February 1869); *Report . . . Relative to Opportunities and Methods for Technical and*

- Higher Education in the Commonwealth.* (Massachusetts House Document—No. 1700, March 1924), 53.
- (13) See Akira Tachikawa. "The Worcester Polytechnic Institute Defeats the Institute of Technology in 1869." *ICU Educational Studies*, XXVII (1985), 3-4.
 - (14) L.B. Caswell. *Brief History of the Massachusetts Agricultural College.* (Springfield, 1917), 9.
 - (15) See William Henry Bowker. *The Old Guard.* (Boston, 1907), 5-6.
 - (16) See Fred. Law Olmsted. *A Few Things to be Thought of before Proceeding to Plan Buildings for the National Agricultural Colleges.* (New York, 1866), 8.
 - (17) Cf. Caswell. *op. cit.*, 8; Harold Whiting Cary. *The University of Massachusetts: A History of One Hundred Years.* (Amherst, 1962), 24. Although French received an honorary A.M. from Dartmouth in 1852, he neither enrolled in, nor graduated from, that, indeed any other, college. A name Henry French appears in the 1833, 1834, and 1835 Catalogues of Dartmouth College, but this is a different person, one year junior to Henry F. French, and he died prematurely at Exeter, N.H. in 1840. See Dartmouth College and Associated Schools. *General Catalogues: 1769-1940.* (Hanover, N.H., 1940), 134, 987; Harriette (French) Hollis to Bowker, April 4, 1909 (Archives of the University of Massachusetts-Amherst).
 - (18) MS, Henry F. French to President Smith, July 9, 1866, (Dartmouth College Archives, #866159) quoted by permission of the Dartmouth College Archives.
 - (19) See Akira Tachikawa. "The Founding of the Massachusetts Agricultural College: An Interpretation." *ICU Educational Studies*, XXVI (1984), 1-28.
 - (20) See "President French's Letter of Resignation." *Boston Journal*, November 12, 1866.
 - (21) Charles G. Davis. "Historical Address." In Massachusetts Agricultural College. *Commemorative Addresses.* 46.
 - (22) *The Fourth Annual Report of the . . . Massachusetts Agricultural College.* (Boston, 1867), 5.

- (23) See *ibid.*, 9.
- (24) See E. Herbert Botsford. *Fifty Years at Williams: Book I.* (n.p. 1929), 16; *The Fifth Annual Report of the . . . Massachusetts Agricultural College.* (Boston 1868), 4.
- (25) *The Fifth Annual Report of the . . . Massachusetts Agricultural College.* 6.
- (26) *The Fourth Annual Report . . .* 12.
- (27) Paul A. Chadbourne. "Agriculture as an Employment." In Massachusetts Board of Agriculture. *The Thirteenth Annual Report.* (Boston 1866), 59. See his *Lectures on Natural History.* (New York 1860), 22.
- (28) *The Fifth Annual Report of the . . . Massachusetts Agricultural College.* 11.
- (29) William S. Clark. *The Relations of Botany to Agriculture.* (Boston 1873), 29.
- (30) See *The Fifth Annual Report . . .* 9.
- (31) See *The Sixth Annual Report of the . . . Massachusetts Agricultural College.* (Boston 1869), 19.
- (32) See *ibid.*, 8.
- (33) See *ibid.*, 22.
- (34) *The Seventh Annual Report of the . . . Massachusetts Agricultural College.* (Boston 1870), 23.
- (35) *Acts and Resolves Passed by the General Court of Massachusetts in the Year 1870.* (Boston 1870), 342.
- (36) *Inaugural Address of His Excellency William Claflin . . . 1871.* (Boston 1871), 819.
- (37) See *Report of the Committee on Agriculture on the Agricultural College.* (Massachusetts House Document—No. 390, May 1871), 2.
- (38) See *ibid.*, 4.
- (39) *Report of the Secretaries . . . on the Agricultural College.* (Massachusetts House Document—No. 420, May 1871), 5.
- (40) The fact is that the MAC had a long pre-history for establishment among the State's agriculturists. See Frederick H. Fowler. "Early Agricultural Education in Massachusetts." *The Fifty-Fourth Annual*

Report . . . of the Massachusetts State Board of Agriculture. (Boston 1907), 331-392.

- (41) Cf. Alexander Brody. *The American State and Higher Education.* (Washington, D.C., 1935), 45.
- (42) See *Report of the Secretaries . . .* (May 1871), 8.
- (43) *Ibid.*, 9.
- (44) See *ibid.*, 10-12.
- (45) See An Act to Amend the Act Incorporating the Massachusetts Agricultural College. May 1871.
- (46) See Resolve in Relation to the Massachusetts Agricultural College. (Massachusetts House Document—No. 463, May 1871), 2.
- (47) William S. Clark. *The Circulation of Sap in Plants.* (Boston 1874), 17.
- (48) *Ibid.*, 21.
- (49) *Ibid.*, 34.
- (50) *The Twenty-First Annual Report of the . . . Massachusetts Board of Agriculture.* (Boston 1874), 205.
- (51) See Alexander Agassiz. "The Museum which Agassiz Founded." In *The Harvard Graduates' Magazine*, (XV 1906-07), 595-603.
- (52) William S. Clark. *Observations on the Phenomena of Plant Life.* (Boston 1875), 18.
- (53) See *The Amherst Record*, Wednesday October 14, 1874.
- (54) Clark. *Observations on the Phenomena of Plant Life.* 65.
- (55) The student enrollments at Harvard College and at the MIT reached one thousand in the late 1870s and 1880s, respectively.