

Edward Orton, Sr.

A patron asked for Edward Orton's middle initial. The only reference to one was in the Board of Trustees minutes of January 1, 1873 (p. 61). They list him as Edward S. Orton, Sr. from Antioch College. He signed his correspondence and all other references are just Edward Orton, Sr.. 8-9-94 bli.

According to Betti St. Pierre, a researcher for Materials Science & Engineering Department, Edward Orton's full name was Edward Francis Baxter Orton, per the Orton Library. 9-27-94 bli

Additional information on Orton can be found in the History of the City of Columbus: Capital of Ohio, Vol. I, 1892, page 906. Pages 663 to 694 were written by Orton regarding the geology and geography of Columbus.

There is also a memorial book on Orton on Shelf 32, Room 109.

6-21-'81

Messrs. Anderson, Godfrey and S. H. Ellis were reappointed by the President of the Board, to draft resolutions expressive of the sentiment of Board concerning President Orton's retiracy from the Presidency of the University.

On motion, the Board adjourned to meet tomorrow at 8:30 o'clock A. M., at the office of the Secretary.

Wednesday, June 22, 8:30 o'clock A. M.

Board met. All the members present except Alston Ellis.

Mr. Anderson, as Chairman of the Committee, presented the following, which was unanimously adopted:

WHEREAS, Edward Orton, President of the Ohio State University, to enable him to devote more time to his special department—Geology—has seen fit to tender his resignation as President after a continuous service of eight years; therefore,

RESOLVED, That in accepting it, which we do with unfeigned regret, we feel that words are powerless to express our high appreciation of his faithful, conscientious and able services in behalf of the University.

RESOLVED, That in his special field, which his earnest endeavors, thorough scholarship and practical talents will further adorn, he should have and will receive our hearty well wishes and co-operation.

RESOLVED. That as a recognition of his eminent labors at the head of our institution, the honory degree of L.L.D. be and the same is hereby conferred on him.

ORDERED, That \$50.00 be and is hereby appropriated to buy specimens for the Geological Museum, and that \$75.00 be appropriated for clerical services in the President's room.

The following degrees were, on recommendation of the Faculty, conferred by the Board, viz.:

Master of Science, Curtis C. Howard.  
Mining Engineer, Ferdinand Howald.  
Bachelor of Arts, Charles M. Lewis.  
Bachelor of Arts, Kenneth D. Wood.  
Bachelor of Philosophy, Josephine M. Bates.  
Bachelor of Philosophy, Harwood D. Pool.  
Bachelor Science, William K. Cherryholmes.  
Bachelor of Science, David O'Brien.

Certificates of Proficiency in Civil Engineering, William E. Hawley, John C. McCullough, Jacob D. Steeper.

Prof. Robinson was instructed to place the Mechanical Laboratory in charge of F. D. Marvin during the vacation.

Reports were read and approved from Prof. McFarland as Bursar, Superintendent of Lawn, and on cost of wind-mill.

On motion, Prof. McFarland was elected Bursar for the next year. at the usual salary \$25.00.

ORDERED, That the bills of the Farm Manager, of

Edward Orton

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DERBY

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077D4  
1900

# EDWARD ORTON

BY SAMUEL CARROLL DERBY, A. M.  
Professor of Latin, Ohio State University; Historian of The "Old Northwest"  
Genealogical Society

(Reprinted from The "Old Northwest" Genealogical Quarterly)



COLUMBUS, OHIO  
1900

LIBRARY  
OHIO STATE UNIVERSITY



*Edward Orton*

## EDWARD ORTON.

Edward Orton was well born. He had behind him not the six "live generations of New England farmers," but an ancestry of such ability and cleanness of life that its potency and vigor remained unimpaired, and we feel no surprise that this stock after two centuries of unnoticed growth at length bore its fruit.

Thomas Orton, the American progenitor of the family, born in England in 1613, was perhaps one of the Ortons of Leicestershire, but nothing more than probability can be claimed for this, as he came to the English home of this enterprising young emigrant, and came to the New World about 1640 and boldly pushed over the frontier settlement which Rev. Thomas Hooker had recently planted at Windsor, Conn. Fourteen years later Thomas Orton advanced to the very verge of the wilderness at Farmington, where he was one of the original proprietors and either died or was he died in 1688. Contemporary records show that he was one of the most wealthy residents of Farmington and held in much esteem by his townsmen.

In the next four generations of Ortons it is sufficient to say that they were reputable men who filled worthily their places in the civil and social affairs of the community where their lot was cast and did not shrink from risking their lives in the various Indian wars, or in the greater struggle for independence. In times of hardships and dangers the women did their duty, as in times of peace.

None of the American Ortons had been farmers. The first farmer in the direct line (Thomas, son of Samuel Miles, Thomas G.) is found in the sixth generation. Thomas Gibbs Orton was early left an orphan and came to the privations of poverty. After being converted by the powerful appeals of Lyman Beecher he determined to become a student. By dint of energy and the closest economy he managed himself for admission to Yale College, but he decided that institution to enter Hamilton College, an institution where he could more easily work his way. He was graduated from Hamilton in 1822. After two years' study of

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Edward Orton was well born. He had behind him not merely "five generations of New England farmers," but an ancestry of such virility and cleanness of life that its potency and promise remained unimpaired, and we feel no surprise that this stock after two centuries of unnoticed growth at length burst into flower.

Thomas Orton, the American progenitor of the family, born in England in 1613, was perhaps one of the Ortons of Leicestershire, but nothing more than probability can be claimed for this surmise as to the English home of this enterprising young emigrant who came to the New World about 1640 and boldly pushed on to the frontier settlement which Rev. Thomas Hooker had recently planted at Windsor, Conn. Fourteen years later Thomas Orton advanced to the very verge of the wilderness at Farmington, where he was one of the original proprietors and settlers and where he died in 1688. Contemporary records plainly show that he was one of the more wealthy residents of Farmington and held in much esteem by his townsmen.

Of the next four generations of Ortons it is sufficient to say that they were reputable men who filled worthily their places in the civil and social affairs of the community where their lot was cast and did not shrink from risking their lives in the various colonial wars, or in the greater struggle for Independence. In all these hardships and dangers the women did their duty as bravely as the men.

Thus far the American Ortons had been farmers. The first liberally educated ancestor in Mr. Orton's direct line (Thomas, John, Samuel, Samuel, Miles, Thomas G.) is found in the sixth generation. Thomas Gibbs Orton was early left an orphan and endured the privations of poverty. After being converted by the powerful appeals of Lyman Beecher he determined to become a clergyman. By dint of energy and the closest economy he prepared himself for admission to Yale College, but soon left that institution to enter Hamilton College, an institution where he could more easily work his way. He was graduated from Hamilton in 1822. After two years' study of

theology at Auburn and New Haven he began to preach. He married December, 1824, Clara, daughter of Rev. Justus Gregory of Deposit, Delaware Co., N. Y. Here their first son, Edward Francis Baxter,\* was born, March 9, 1829. Because of ill-health, the father was ordered by his physicians to seek a more favorable climate than that of the Susquehanna Valley and found it, in 1837, on the shore of Lake Erie where at Ripley, N. Y., he made his home for many years. Thomas Orton was a zealous and effective "Evangelist," with many of the agreeable qualities of his more famous son, and is still held in affectionate remembrance in western New York. In theology he was a strict Calvinist of the school of Dr. Nathaniel Taylor, under whom he studied at New Haven. Withal "he had the practical talent of the genuine New Englander; had as much knowledge of farming as any farmer in his parish." He had an eager love of nature which found much to stimulate it in the fair country about Ripley.

In this pleasant township the childhood of Edward Orton was passed and here he acquired so deep an interest in country life that he never grew weary of its delights, and a knowledge of the farmer's vocation which later in life stood him in good stead. In his boyhood he often worked by the day and occasionally by the month for neighboring farmers. He was an active boy, quick to learn and very sensitive to ridicule. Under the tuition of his father, and by study in the neighboring academies of Westfield and Fredonia, Edward was fitted at the age of sixteen to enter the sophomore class of Hamilton College, his father's *alma mater*. Six other members of his class (1848) entered at the age of fifteen. The journey from Buffalo to Utica was made by the fastest route then available, a red-line packet boat on the Erie Canal, and though the time of the journey had recently been reduced by one-half, it still occupied two days and two nights, with an average rate of four miles an hour.

In 1898 Dr. Orton prepared the half-century letter for his class and prefaced it with humorous and suggestive reminiscences of his college life. Of his preparation he said: "I entered the class of '48 in its sophomore year with enough scholastic attainments to pass muster, but lacking because of immaturity the ability to make the most out of a college course." Yet there is good evidence that he took very high rank in the largest class (it numbered 40) that up to that time had gone out from Hamilton, and one that included among its members, Dr. Thomas S. Hastings, President of Union Theological Seminary; Dan P. Eells, the banker; Edward A. Sheldon, founder of the Oswego Normal School; and Mayor Van Allstyn of Albany, N. Y.

The best known of the Hamilton faculty were Theodore W. Dwight and Edward North; the former acquired later at Columbia a national reputation as a jurist, and at Hamilton by means

\*In later life Mr. Orton omitted the last two of these names.

of an uncommonly retentive memory conducted recitations in Latin without the text-book. Of the curriculum Dr. Orton says, in part: "We had no elective studies. The entire course was prescribed and obligatory upon all alike. No account was taken of difference of tastes or difference of purpose, . . . we introduced electives for ourselves by giving scant attention to certain studies that were not altogether to our liking and concentrating our energies on studies that we enjoyed. . . . The arguments that we so often hear, that one gains at least valuable discipline by mastering some study that he does not like, seem to me hardly to apply to our experience, the majority did not *master* what they did not like; they wasted more or less time on such branches. We had no natural sciences to speak of and no laboratories. . . .

"Social, economic and political sciences, as such, were scarcely known to us. . . . If we really and sincerely wished to serve the world, there was just one vocation in which the work could be done, viz. the Christian ministry. . . . The same initial purpose is now spread through half a dozen different callings. . . . We had no inter-collegiate contests of any sort. In fact, we rarely met students of other colleges. We had few college songs and no college colors, while college and class yells had not yet emerged from the infernal pit, but we were not lacking in loyalty to Hamilton and certainly it never occurred to us that life was not worth living. Speaking for myself I can safely say that I received my best and most practical college training from the study of Greek. I have had little to do with the Greek language or literature since I left college, but I secured by the study better habits of thought, and especially greater exactness of expression than I could otherwise have attained." One sentence more must not be omitted: "The idea of *service* was the best I took away from college walls."

Mr. Orton's first year after graduation was spent in teaching at Erie, Pa., where he held the position of assistant in an academy, whose principal was his classmate, John H. Black.

Mr. Orton's ultimate purpose, however, then and for several years afterwards, was to fit himself for the Presbyterian ministry. Accordingly he began a course of study at Lane Theological Seminary, Cincinnati, Ohio, in the autumn of 1849. It is likely that he was drawn there because its president was Dr. Lyman Beecher. While at Lane Mr. Orton was a member of the Tabernacle Church and was active in mission and Sunday School work among the neglected children of Cincinnati, and labored with his own hands in erecting a building for their use. He paid his expenses wholly or in part by private teaching. After the end of the year, because of temporary failure of eyesight, and, possibly, because of doubt as to the truth of the Calvinistic system, he withdrew and spent some months in out-door life and traveled much on foot through New York and Pennsylvania. Probably it was at this time (1850) that he went on a

voyage, perhaps as supercargo or purser, in a coaster as far at least as Tampa, Florida. From this trip he came back with a more pronounced abhorrence of African slavery. His interest in natural science was undoubtedly quickened by what he observed during this voyage. In the spring of 1851 Mr. Orton became a teacher in Delaware Literary Institute, a noted academy, located at Franklin, N. Y., under the control of the Congregational Church. Here young men were fitted for college, and in some cases for even the sophomore or junior class. Mr. Orton was an energetic and inspiring teacher; his moral earnestness and interest in the highest welfare of his pupils were clearly shown. His instruction was marked by abundant knowledge, enthusiasm, and a strenuousness which was characteristic of him. Through his efforts the natural sciences were made a far more prominent feature in the course of study than before, and his own taste for this department of knowledge developed rapidly. In the Catalogue he was styled "Instructor in Natural Science and German," but both at Franklin and elsewhere Mr. Orton taught a variety of other subjects, mathematics, history, Latin and English. The Institute was well supplied, for that time, with buildings, and fairly well equipped with library and apparatus. The number of pupils was about 250 a year. Mr. Orton went on excursions with his classes and in a variety of ways made his rare social gifts contribute to their pleasure and profit. He advised them to read Macaulay, Carlyle, and Shakespeare, then favorite authors with him.

A growing interest in the sciences led Mr. Orton to spend the year 1852-53 in the Lawrence Scientific School of Harvard University as a special student in chemistry and botany. His principal teachers were Horsford, Gray, and Cooke. This school and the Sheffield school at New Haven had been founded quite recently to meet the growing demand for instruction in chemistry, physics, geology, etc., and may be regarded as the first of their kind in the United States. The Rensselaer Institute at Troy, N. Y., was practically a school of engineering. At first men who, like Mr. Orton, had been educated by the older methods of the classical colleges, formed a considerable proportion of the students of the Lawrence School. Here for the first time he had laboratory instruction. Horsford and Gray were New York men by birth and training. His apparent failure to take work under Agassiz was no doubt due to the latter's absence from Cambridge during the greater part of the years 1851-53, while connected with a medical school at Charleston, S. C.

At Harvard Mr. Orton lived in a different theological atmosphere from that to which he had hitherto been accustomed. Of the religious opinions prevalent there Dr. James Walker was the most able exponent, and a preacher of unusual power.

The following year Mr. Orton spent as teacher at Franklin, but had not yet relinquished his long cherished purpose of entering the ministry. With a view to better preparation for

this vocation as well as to lay some troublesome doubts, Mr. Orton entered Andover Theological Seminary in 1854 and remained for one year but did not graduate. Dr. E. A. Park was then the central figure at Andover and at the zenith of his great powers. During the year at Andover Mr. Orton began a life-long friendship with Dr. John Bascom, later, professor at Williams, and president of the University of Wisconsin. "We were drawn to each other," says Dr. Bascom, "by an incipient freedom of religious belief and by the pleasure we took in outdoor excursions."

In the autumn of 1855, Mr. Orton, who had recently married, became the acting pastor of a Presbyterian Church at Downsville, a small hamlet in the township of Colchester, Delaware Co., N. Y., and was ordained January 1, 1856, at Delhi, by the Delaware Presbytery under whose charge he had been a licentiate since June 1, 1852, and from whom he asked and received in June, 1856, a letter of dismission to the Presbytery of Albany. He had accepted there the professorship of Natural Sciences in the flourishing State Normal School. This was the first Normal School in New York. It had been in successful operation for a dozen years and had sent out a thousand teachers; the annual enrollment was about one-fourth of that number. Dr. David H. Cochran, who had recently been put at its head, was a graduate of Hamilton where he had known Mr. Orton and formed a favorable opinion of his ability and character. Because of this estimate, as well as on account of his good success at Franklin, Mr. Orton was invited to take the post at Albany.

The position was for many reasons an attractive one; the work and associations were congenial and the city contained the State Geological Collection, then one of the finest in the United States. This and other collections were convenient of access and freely opened to competent students. Well trained men were in charge of these museums and with them Mr. Orton formed agreeable and helpful friendships. But at the end of his third year of service in the Normal School he felt constrained, on account of alleged heterodox opinions in theology, and to avoid the scandal of a public controversy, to resign a position which he had filled with marked success. There can be no doubt that his subsequent career was greatly modified by this action.

The best place open to him was the principalship of a small academy at Chester, Orange Co., N. Y. This he accepted and held for six years, during which he made a strong impression upon the community and greatly improved the school. Many pupils were fitted for college. Mr. Orton consoled himself in his isolation by studying science, lecturing upon scientific subjects, including agriculture, and by gardening. He felt a lively interest in the events of the Civil war.

His most valued friend was Rev. Austin Craig, pastor of an independent society at Blooming Grove, a neighboring township. In 1865, Dr. Craig became acting President of Antioch College,



at Yellow Springs, Ohio, and with others was instrumental in bringing Mr. Orton to that institution as principal of its preparatory department. Of this appointment Mr. Orton wrote to a friend, "I feel very thankful that the prison doors are at last opened for me and that I can get some more worthy work to do." At Antioch he was soon made professor of Geology, Zoology and Botany and speedily gained such repute as a Geologist that upon the organization of the second Ohio Geological Survey, in 1869, Governor Hayes appointed him second assistant under Dr. J. S. Newberry; he was re-appointed by Governor Noyes, in 1871. During his connection with Antioch College Mr. Orton taught as in previous positions a variety of subjects with notable success; his classroom was thronged by enthusiastic students and his subjects were their favorite studies. He was rapidly gaining a more than local reputation as teacher and scientist when he was made president of Antioch in 1872. This appointment was well received and his administration of the college was vigorous and able. Still the outlook and circumstances of that college were not encouraging, and domestic affliction helped to weaken the ties that bound him to Antioch and her doubtful fortunes.

The "day of small things" was nearly over and the offer of the presidency of the Ohio Agricultural and Mechanical College, which was to be opened at Columbus in the autumn of 1873, presented an opportunity which he could not let slip. He was, also, made professor of Geology in the new institution and retained his place upon the Geological Survey.

It is obvious that the first President of this college founded upon the "Land Grant of 1862" would have much to do with the shaping of its policy. The question of the narrower or broader interpretation of its proper scope had arisen early in its history and by the energy and foresight of a bare majority of its Trustees and of Mr. V. B. Horton and of Mr. Joseph Sullivant in particular, had been decided in one or more points in favor of the broader plan, but the question was not to be so easily settled. Those who are pleased that the Ohio State University has been developed out of the earlier institution gladly recognize the strong and steady guidance of Dr. Orton in leading the public and the constituted authorities of the college to the larger and, as we fondly believe, the wiser and more helpful interpretation which is now generally accepted as the true definition of the much-discussed phrase, "the liberal and practical education of the industrial classes in the several pursuits and professions of life." Dr. Orton's opinions are carefully expounded in his Inaugural, and even more explicitly in the address which he gave at the graduation of the first class from the University June 19, 1878, "The Liberal Education of the Industrial Classes." His earlier opinions had now become settled convictions based upon years of fruitful experience in the practical working of the new experiment in education whose

success was in no small measure due to him. He had always striven to have a high educational standard maintained in every department; he had set his face like flint against the seductive but dangerous policy of lowering the requirements for admission in order to swell the roll of students; he stood firm for quality rather than for numbers. His relations with his colleagues were marked by rare discrimination, fairness and tact. As a disciplinarian President Orton was slow to convict, and reluctant to punish, but whenever a vital principle was concerned few were more inflexible.

President Orton's relations with the public and his services outside the walls of the college were of more importance to it than his wise administration within the narrower circle of students, faculty, and trustees. The new college met a cold reception. There was misunderstanding and unjust criticism of its policy, its officers, of what was done and what was left undone. The confidence of the people of the state was to be won, and was won, in large measure through the tact and unremitting efforts of its President, who addressed public meetings in cities and villages, lectured before conventions of teachers, farmers' institutes, gatherings of miners, and literary societies, and never failed to benefit the institution which he represented. The trips he made to various points in Ohio for geological investigation were fruitful in making friends for the college as well as for himself. In such outside labors his winning address, social tact, and rare faculty of recalling names, faces, and items personal to those whom he had once met, were very effective. All recognized the kindly feeling which made his memory retentive, his recognition cordial.

In 1881, after eight years of such varied and helpful labor, Dr. Orton resigned the presidency of the Ohio State University, a title to which the former name of Agricultural and Mechanical College had been changed in 1878. He retained the professorship of Geology and devoted himself with increased ardor to the work of his department and to a more careful study of the various geological problems of Ohio and the adjoining states.

Upon the reorganization of the Ohio Geological Survey in 1882, Governor Foster made Dr. Orton its chief, and from this time until his death he remained State Geologist. The fifth, sixth, and seventh volumes of the Final Reports of the Survey, one Annual Report and one or more special reports were published under his direction. During the later period of the Survey his attention was directed chiefly to questions of Economic Geology; he gave, also, much time and thought to the problems of sewage disposal and water supply in their geological and hygienic relations to the community and to the State at large. On the production, origin and supply of natural gas and petroleum he soon became a high authority. These products in their various aspects were studied by Dr. Orton in Ohio, Kentucky, Indiana and New York, and reports made by him upon

these substances were published by the United States Geological Survey and in the Eleventh Census of the United States. For the Geological Survey of the State of Kentucky, also, similar investigations were made by him, in the western half of its territory. Individuals and corporations came to place great confidence in his honesty and sound judgment as an expert in this field of applied science. A man of less scrupulous honor might easily have enriched himself through such proficiency. Of Dr. Orton as a geologist the unscientific layman must speak with due caution, and rely in great measure upon the opinions of other geologists. It is probable that Dr. Orton's careful and systematic study of geology began at Albany, where the Curator of the State Geological Collection, Col. E. Jewett, was his intimate friend and instructor in field geology and in the identification of fossils, being accounted good authority in both.

Dr. Orton's first geological observations were undertaken with the distinct purpose of making himself a more efficient teacher of geology and in his early acquaintance with rocks and fossils his point of view was that of the educator. Later he developed a taste for geology as a science. As a teacher it was necessary that he should take a wide and conservative view of the field of geology; this made him a safer specialist, and largely shaped the method and even the language of his writings. His style was in a marked degree free from the technical language usually employed by specialists in geology, and was adapted to unprofessional hearers and readers. In applied science his merit was perhaps more conspicuous than in pure science and his effort to be of service to his fellows more strenuous. "Through official reports," says Dr. G. K. Gilbert, "through the columns of newspapers, and through personal conversation, he imparted not only statistical information and general principles concerning the occurrence of ores and mineral fuels, but practical and timely advice as to their exploitation and conservation. Employed by the people, he labored for the people, and he gave them the bread for which they asked." He was in the service of the State for thirty years and had devoted more time to the geology of Ohio than any other person, and in particular had treated the scientific and practical aspects of the Ohio gas and oil fields with a thoroughness which has no parallel. His most important contribution to science is, perhaps, his theory as to the relations of gas, oil, and brine in subterranean reservoirs, a theory which explains all the phenomena and is so simple that one is surprised that it had not occurred to many. Dr. Orton studied and wrote, also, upon the building stones, limestones, iron ores, rock waters, gypsum, and clays of Ohio and other states.

As a citizen Dr. Orton showed a lively interest in all that concerned the welfare of the community and the nation. As a member of the Columbus Board of Trade he served many years in committees on Health and Sanitary Affairs, and Water, and

was made an honorary member of that Board in 1891. Politically he might be styled an independent Republican.

In everything which he undertook Dr. Orton worked intensely, and did not spare himself in the least. The time which other men take for recreation and vacations was regularly spent by him in strenuous labor. The amount and variety of work thus accomplished was a constant source of surprise to those who knew him well. But they felt, also, that there was danger that toil so intense and so continuous would bring ill results, and so the event proved. For several years he had suffered from insomnia which he had neglected, or had been unable to cure. Yet he was apparently in the full tide of vigor and productive capacity. He had important work in hand and in prospect. Early in December, 1891, he gave an address at Antioch College and while returning to Columbus the following day suffered a stroke of paralysis which wholly deprived him of the use of his left arm and caused a perceptible limp in his gait, but left his mental powers unimpaired. The blow was a cruel one; by it, as he wrote to a friend, he "became an old man in a day." But he strove valiantly against partial helplessness and unavoidable dependence upon the kind offices of friends. He bore with singular patience the resulting burden of disability. He took up his duties again with resolution, though always under the shadow of an inevitable fate. More than before, as it seemed to those who loved him, he lived and wrought "as in my great Taskmaster's eye."

During the following eight years Dr. Orton performed his duties as professor of Geology and brought out the final volume of the Reports of the Geological Survey, as well as some smaller publications in the same field. Not infrequently he gave a public address, and some of his finest occasional papers belong to this period.

In 1898, upon the fiftieth anniversary of his graduation at Hamilton College, the class entrusted to him the honorable duty of preparing the customary half-century letter. This missive contained a brief biography of each of the forty members of the class, prefaced by a description of college life as he and his classmates saw it fifty years before. These reminiscences combine wit, wisdom, and pathos, and might fitly have borne the motto, *te morituri salutamus*.

His associates at the University marked the seventieth anniversary of his birth by tendering him a dinner on the evening of March 9, 1899. At this reunion Dr. Orton made a short address which touched and thrilled every hearer by its sweetness and tone of lofty cheer.

The university year 1898-99 bore heavily upon him. The long and dangerous illness of his wife while absent at her former home in Massachusetts caused him much anxiety. To this strain was added the care, which could not be wholly transferred to others, of preparation for the Columbus meeting of the

American Association for the Advancement of Science, over which he was to preside.

After that meeting, in whose success he took a justifiable satisfaction, Dr. Orton's health failed perceptibly, and, wiser than his friends, he felt that the symptoms were very serious. Happily he was spared a long illness and suffered no eclipse of his mental powers. His release came suddenly and almost painlessly, October 16, 1899. During the previous evening he three times had read to him, by as many different members of his household, Browning's poem, "Prospice," beginning:

"Fear death? to feel the fog in my throat,  
The mist in my face,  
When the snows begin, and the blasts denote  
I am nearing the place,  
The power of the night, the press of the storm,  
The post of the foe."

Was it a foreboding, or a tender intimation to those dear to him of what the morrow brought?

Dr. Orton married Aug. 30, 1855, Mary M. Jennings, daughter of Judge Beach Jennings of Franklin, N. Y.; she died April 8, 1873. Four children, Charles Jennings, Clara Gregory, Edward, Jr., and Mary Jennings, were the fruit of this marriage and all are living. Aug. 26, 1875, he married Anna D. Torrey, daughter of Samuel Torrey, M. D., of Millbury, Mass., who with two children, Louise Taft and Samuel Torrey, survives him.

It is but simple truth to say of Dr. Orton that he was most faithful and devoted in all the relations of domestic life and displayed those qualities which made him the almost idolized center of his home and the wider circle of intimate friends. Nowhere else was his conversation so replete with anecdote and reminiscence, or so brightened with wit and unexpected humor. He there revealed sides of his nature the more charming because they were unexpected.

Dr. Orton's interest in genealogy became active about the time he resigned the presidency of the University, and resulted in his gathering the facts for a history of his line in America. The volume was published in Columbus in 1896, with the title, "An Account of the Descendants of Thomas Orton of Windsor, Connecticut, 1641. (Principally in the Male Line)." Naturally, he became one of the founders of the "Old Northwest" Genealogical Society and was chosen its first president.

Dr. Orton was slightly below medium height, but of robust and well-knit frame, active and vigorous in movement, and capable of intense and long-continued intellectual labor. His favorite exercise, begun in youth and continued well on to the end of his life, was walking, and students who accompanied him upon excursions were surprised at his speed and endurance as a pedestrian. The portrait which precedes this sketch was taken in his fifty-seventh year.

In conversation, Dr. Orton disliked to descend to trivialities and gossip; he paid you habitually the exquisite compliment

of assuming that you were interested in high thinking and noble action; that you were reading the best books and knew, or at least wished to know, the most recent discoveries in travel and exploration, the latest scientific hypothesis, the most fruitful criticism or theory in historical research, in morals, in problems relating to public charity or to the health of the community.

The statement of religious opinions which follows is believed to have been prepared by Dr. Orton himself for a biographical sketch: "In theological views he exchanged, about the year 1859, the Presbyterian creed in which he was born and educated, for a shorter one. For the last twenty-five years he has been in sympathy, though not formally connected, with the Unitarian denomination." Dr. John Bascom said of his friend: "He took as constant and warm an interest in all questions pertaining to our spiritual life as any man I have ever known. . . . No change of belief with Dr. Orton was the result of indolence or indifference."

He was a member of many scientific bodies; among these were the Ohio Archaeological and Historical Society, Ohio Academy of Science, Geological Society of America, of which he was president, 1897, and the American Association for the Advancement of Science, whose highest honors he received in 1899. The vice-presidency of its Geological and Geographical Section he held in 1885, at the Detroit meeting.

His *alma mater*, Hamilton, gave him, in 1875, the degree of Ph. D., and that of LL. D. was conferred upon him by the Ohio State University at the close of his presidency, in 1881.

His writings comprise many articles in scientific and technical journals, and a large portion of the various volumes of the Reports of the Second and Third Geological Surveys of Ohio (1869-1888, 1888-1894). Only a few of the occasional lectures and addresses, in which he was singularly felicitous and effective, have been published.

The life-long friend previously quoted (Dr. Bascom) gives this estimate of Edward Orton: "Dr. Orton had a diligent, penetrative and comprehensive mind . . . ."

"As a friend Dr. Orton was very considerate and self-sacrificing. His inimitable courtesy and sweetness of voice opened a path before him like sunshine. Few men are found as uniformly fitted to do good and to avoid the evils of belligerency as was he. His usefulness and his success lay almost exclusively in his own personal endowments."

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- NOTE.—Corrections and additions may be sent to Librarian, Ohio State University, Columbus, Ohio.



# EDWARD ORTON

1829 — 1899

|   |          |         |
|---|----------|---------|
| HAMILTON COLLEGE                        | CLASS OF | 1848    |
| LANE THEOLOGICAL SEMINARY               |          | 1849-50 |
| LAWRENCE SCIENTIFIC SCHOOL HARVARD      |          | 1852-53 |
| ANDOVER THEOLOGICAL SEMINARY            |          | 1854-55 |
| PASTOR DOWNSVILLE NEW YORK              |          | 1855-56 |
| PROFESSOR STATE NORMAL SCHOOL ALBANY NY |          | 1856-9  |
| PRINCIPAL CHESTER ACADEMY NEW YORK      |          | 1859-65 |
| PROFESSOR ANTIOCH COLLEGE OHIO          |          | 1865-72 |
| FIRST PRESIDENT OHIO STATE UNIVERSITY   |          | 1873-81 |
| PROFESSOR OF GEOLOGY                    |          | 1873-99 |
| STATE GEOLOGIST OF OHIO                 |          | 1882-99 |

A TEACHER BELOVED BY STUDENTS AND FACULTY  
A PRESIDENT ESTEEMED AND HONORED BY TRUSTEES  
A SCHOLAR DEVOTED TO SCIENCE AND ITS APPLICATIONS TO ECONOMIC PROBLEMS - A PHILANTHROPIC  
CITIZEN WHOSE COUNSELS GUIDED THE CITY  
AS FIRST PRESIDENT HE LAID THE FOUNDATIONS  
OUTLINED THE POLICY & GAVE CHARACTER TO THE  
UNIVERSITY HE SERVED FOR TWENTY-SIX YEARS

THIS BUILDING  
ERECTED IN 1892 UNDER HIS GUIDANCE  
AND DEDICATED TO HIS MEMORY  
IS NAMED

## ORTON HALL

FIRST UNITARIAN CHURCH

DEDICATION SERVICE

EDWARD ORTON

1829 - 1899

THIS SHELF OF BOOKS HAS  
BEEN GIVEN IN MEMORY OF  
EDWARD ORTON - SCHOLAR - IN-  
SPIRATIONAL TEACHER - AD-  
MINISTRATOR - GEOLOGIST OF  
NOTE AND FIRST PRESIDENT  
OF OHIO STATE UNIVERSITY -  
HE BECAME A UNITARIAN WITH  
SINCERE CONVICTIONS THOUGH  
EDUCATED UNDER CALVINISTIC  
INFLUENCES - HIS UNSWERVING  
FAITH INVOLVED SACRIFICES  
CHEERFULLY BORNE AND NOBLY  
EXEMPLIFIED - A CONTEMPORARY  
HISTORIAN DESCRIBED HIM AS  
AN HEROIC FIGURE IN THE  
STRUGGLE BETWEEN THE OLD  
ORTHODOXY AND THE LIBERAL  
POSITION OF THE UNITARIANS

(from commemorative plaque)

EDWARD ORTON AND HIS TIMES

Memorial Address by Dr. Morton H. Frank at the  
First Unitarian Church, Columbus, Ohio on May 19, 1963



Sunday, May 19, 1963

Prelude: Sonata for cello and piano  
by Harriett Hallock Bolz  
Caroline Henning, cello  
Mildred Hernandez, piano

Reading: Eternal Father, the stay of all our  
generations. . .  
from Home Prayers by James Martinean  
Gene Nielsen

Hymn No. 16

Reading: Eternal God, to whose shelter we fly!  
from Home Prayers by James Martinean  
Gene Nielsen

Hymn No. 360 (2d tune)

Announcements

Offertory: Psalm 100 Choir  
by Jean Berger

Address: "Edward Orton and His Times"  
Dr. Morton H. Frank

Presentation: Memorial Shelf of Books and Plaque  
Louise Orton Caldwell

Acceptance for the Congregation John Evans

A Covenant Congregation

Affirmation of Faith Congregation

Benediction John Evans

Choral Response Choir

At the close of the service, the books  
and plaque given in memory of Edward  
Orton may be viewed in the Music Room.  
Refreshments will be served in the  
Worship Center.

Our speaker for next Sunday will be Hall  
Cary.

\* \* \* \* \*

## EDWARD ORTON AND HIS TIMES

Edward Orton lived through a tumultuous period of world history. As one historian has put it, "in the intellectual and social sphere, the second half of the nineteenth century and the opening years of the twentieth...were a time of the greatest ferment of ideas and revolution in attitudes since the close of the middle ages."<sup>1</sup>

The industrial revolution and the unprecedented growth of the sciences presented society with new ways of doing things and new modes of thinking.

In old Europe, with its landowning and ecclesiastical hierarchies dominant for a thousand years, the resistance to social and intellectual progress was deeper and the solutions which came to the fore were -- and had to be -- more far-reaching than in the youthful United States. At the same time, the perturbations that shook Europe had significant parallels in America.

We will consider the life and contributions of Edward Orton against the background of these social and intellectual struggles between the old and the new and between the old religious orthodoxy and the new religious liberalism as they manifested themselves in this part of the country and in this community.

Edward Francis Baxter Orton was born in 1829 of a line of five generations of New England farmers.<sup>2</sup> He was the son of Samuel G. Orton,<sup>3</sup> the first of the family line to have received more than an elementary education. Samuel Orton was a strict Calvinist and a zealous and effective evangelist.

The son's early education directed him toward the Christian ministry. His basic intellectual commitment remained unsettled for many years however, with the result that the external features of his early life reveal a seeming lack of direction. A crucial event in Edward Orton's career occurred in June of 1859, when he was forced to resign from the staff of the State Normal School at Albany, New York under charges of heresy.<sup>2,4</sup> During the fourteen-year period between 1845 and 1859, young Orton had attended four different colleges and seminaries, had taught at three different elementary schools, and also had served as acting pastor for a year at a small Presbyterian Church.

Before his final break with Presbyterian orthodoxy, young Orton had gone through a long period of doubt and indecision. The year 1852-53, which he spent as a special

student in chemistry and botany at the Lawrence Scientific School of Harvard University did much to form his mature views. He received his first laboratory instruction there and under a theological atmosphere which was more liberal than that to which he had been accustomed.

The scientific interests of Edward Orton and his turn toward liberalism in religion proceeded side by side. His special interest in geology evidently developed from his involvement with controversies over whether or not the Biblical story of the Creation should be taken literally. He had turned to the "testimony of the rocks." Having turned away from the doctrinaire rigidities of the orthodox churches, Edward Orton remained nevertheless a deeply religious man to the end of his life. As I read over his speeches and writings, his religious outlook appeared to me to be personal and moral, rather than doctrinal. The words of James Martineau which were read during the service this morning characterize Edward Orton perfectly: "Mortify within us all vanity and self-will...Subdue us, good Lord, to the humility of Christ." In his personal modesty and in his relations with others, Orton tried to follow in the path of the historical Jesus of Nazareth.

To return to our historical account of Edward Orton's life, in 1865 he left New York State and went to Antioch College in Yellow Springs, Ohio to teach. He soon became Professor of Geology, Zoology, and Botany. He speedily gained a reputation as a geologist. In 1869 he was appointed to work on the second Ohio Geological Survey. In 1872 he became President of Antioch.

In 1873 he came to Columbus to become the first president of the new land grant institution established under the provisions of the Morrill Act, and known as the Ohio Agricultural and Mechanical College. He also joined the faculty as Professor of Geology.

The great controversy at the time in regard to the new college had to do with the character of the education to be offered.

A bare majority of the trustees favored the "Broad Gauge" idea, that is, as James M. Cowly wrote at the time in the Ohio State Journal,<sup>5</sup> "the establishment of an institution of learning upon the broadest and most liberal foundations," as opposed

to the "Narrow Gauge" view, which held that the new college should serve only for the practical training of farmers and artisans.

When the college opened its doors, the campus was farmland, well outside the outskirts of town. Columbus was a bustling and rapidly growing community with a frontier character. In 1873, when Edward Orton came here, the population of Columbus was only about 37,000. In 1899, when he died, the population of the city had increased to over 120,000. At the opening of the College there were only seven faculty members and perhaps 15-20 students. The entire college was housed in an unfinished building, later to be known as University Hall. Many of the professors lived in the building, and there was a dining hall in the basement. There was no gas, electricity, or municipal water. There was not even a telegraph connection to Columbus. It is not surprising that Professor Orton's Inaugural Address as President was delivered downtown, in the Chamber of the State Senate. The date of the address was January 8, 1874.

Since this Inaugural Address was probably his most important speech and tells more than any other single speech what Edward Orton stood for, I will take the liberty of quoting several extended excerpts from it.<sup>6</sup>

"An institution of learning has its formal opening in Ohio today which, unless it grievously disappoints the purposes of its founders and the hopes of its friends, is to be specially connected with the industrial education of the State. It seems, therefore, ...scarcely less than imperative, to briefly discuss on this occasion the subject with which we are thus brought face to face, Industrial Education, its character and claims...

"Certain of the higher groups of animals are capable of being trained and taught; but...man is the only educator....He teaches to his successors the steps of his own ascent. He bequeaths to his heirs the weapons by which he has won his own conquests over nature....

"This sense of obligation to make provision for the instruction of our heirs has been wonderfully intensified by the influence of Christianity... And most of all in our own country, where the doctrines of equality and brotherhood...have found for themselves a practical expression in democratic institutions, has the necessity of a comprehensive scheme of education been from the first apparent....

"To the better instructed generations that are to come after us, the results that we now attain in the education of our people will seem most inadequate...but we attest at least our profound sense of the importance of public education by the munificence with which we provide for it.

"The question of how much shall be furnished in our courses of public instruction, is one of grave practical importance...An argument can be made for limiting the work of instruction at the public expense to the strictly

elementary branches...But this scheme...has failed to meet the demands of those for whom it was provided. As our communities have grown richer,... the courses of study have been expanded into many times their original proportions...It has in this way been decided in all of the more advanced communities of the country, that public instruction should be made liberal in its character."

In referring to the provisions of the Morrill Act, President Orton continued:

"The education to be furnished is Industrial Education...The grant is designed 'to promote the education of the industrial classes, in the several pursuits and professions of life.' If it is asked who are the industrial classes of American society, I answer, the great mass of the American people. Such is the respect for labor among us,...that the designation becomes an honorable one, and it seems almost invidious to refuse it to any portion of our population,... The providing of the best advantages in the higher departments of instruction at lower rates than elsewhere, and the consequent removal of the great obstacle from the rank and file of society in the way of obtaining an education, we may certainly set down as one of the objects designed. To the mass of the industrial classes of this State, the privileges of Harvard, Yale or Vassar are practically as inaccessible as those of Cambridge or Heidelberg.

"The narrow signification sometimes given to this term, industrial education, is expressly repudiated by the authors of the... law ... They give no sanction to the un-American, aristocratic scheme which sets the industrial classes on one side of a line and the cultivated classes on another, and which confronts every man born within the limits of the first division with a 'Thus far shalt thou come and no farther;' which... doles out to him...just the kind and amount of training which will make him more efficient as a hewer of wood and a drawer of water -- a scheme that has for its avowed object to train the artisan rather than the man....

"In the second place, [according to the Morrill Act] the education to be furnished must be practical....

"What shall be said of the study of language...? Is not the power to make clear, accurate, intelligible statements of what we know or of what we think, a practical power?... Again, is not the training that enables us to detect a flaw in a definition, or a fallacy in an argument, as directly practical as the ability to test the strength of iron...? The limits of the practical are wider than we sometimes think.... All true science is practical in the best sense of the word, for what is science but a knowledge of causes...? True science learns the process and deduces the cause. Practice stops with the process alone....

"In our zeal for the practical applications of science, [we must not] forget the...root from which they spring.... It is the theory of one generation which bears the practical fruit of the next. We marvel...at the number and value of the contributions of science to human welfare which our own age has produced, and we glorify the authors of these practical applications; but let us not forget their forerunners and instructors, the men who, without the inspiration of popular applause and without the hope of material reward, maintained the lonely quest of truth....

"We rejoice...in the fair growth of scientific applications; but let us not forget the deep root from which they spring -- the scientific enthusiasm, the love of the truth for its own sake. Unless this root continue to spread in darkness and seclusion into new fields... the vine can yield no new fruit.... In the best interests of practical utility, then,

we must find a place... for pure science as well as for applied science....

"The education to be furnished this institution must, according to the terms of its charter, be a liberal education. What is a liberal education? Aristotle first used the term... and by it he attempted to designate an education fit for a freeman. He might have justly included an education that should give freedom to its possessor, that should liberate him from... narrowness, and prejudice, and isolation, the slavery of an uneducated mind....

"There is no more beneficent provision in the charter of the College than that which requires the industrial education which it furnishes to be liberal. The liberal education of the industrial classes! Such a phrase would be a contradiction in terms in any other days than the present, and in any other land but our own.

"The motto that 'the cobbler should stick to his last,' if taken literally, is a heathen motto, and the pseudo-scientific scheme of education that would teach the cobbler nothing but the science pertaining to sole-leather and waxed-ends is a heathen scheme. The farmer's case is better... than that of any other class if he is trained on this plan, for his field is the world of physical science, and cannot be made narrow. But why not make it broader? Why shut him out from the studies that pertain to man? Why not teach him the history of his own race as well as that of thoroughbreds and shorthorns?...

"The Ohio Agricultural and Mechanical College has been organized in good faith upon these provisions. Its endowment and its equipment make it possible for it to render signal service to the education of the State, and such service it is eager to render...."

In 1878, which was still during President Orton's administration, the name of the institution was changed to Ohio State University. President Orton, among others, had favored this change on the ground that the old name did not convey that the objective of the institution was liberal education.

It may be noted that not everyone favored the change.<sup>7</sup> There was a storm of protest from farmers that the funds of the institution were being diverted from agricultural and mechanical education. There was also protest from the friends of the small denominational colleges, who denounced Ohio State University as Godless school, because no chapel exercises were held. Judge Thomas C. Jones of Delaware, who was a member of the first Board of Trustees expressed the sentiment of this coalition in the following statement, which was widely quoted at the time:

"The institution has already got as far as possible away from God and Agriculture."

(You see that the broad outline of present-day struggles had already emerged.)

Dr. Orton resigned as President in 1881. In offering his resignation he expressed

the desire to be relieved of the arduous duties of President in order to devote his entire time to geology. One of the reasons for President Orton's resignation which does not appear on the official records was that he opposed daily religious exercises at the College, which were insisted on by the Board of Trustees, as a sop to the backward elements of the State.<sup>8</sup>

Edward Orton's scientific work continued to occupy his attention. In 1882 he was appointed State Geologist and Chief of the Ohio Geological Survey. In the course of his geological work he became interested in problems of water supply and sewage disposal, and hence in public health. He served for many years on committees on Health, Sanitary Affairs, and Water of the Columbus Board of Trade.

Edward Orton seldom expressed himself publicly on social questions and then only on such matters as had to do with his special areas of concern. We have already seen how his Inaugural Address as first President of Ohio Agricultural and Mechanical College went beyond educational policy to comment on opportunity for the industrial classes and respect for labor.

I would like to mention and quote from an address that Orton delivered before the Ohio State Medical Society in 1882.<sup>9</sup>

In this address, which dealt chiefly with sources of clean water, proper sewage disposal, and need for a State Board of Health, Professor Orton began by quoting Disraeli that:

"The health of the people is the first duty of the statesman."

"The importance of the subject," Orton averred, "transcends every other material interest of the State... The power of the State in the present and its promise for the future are gauged by the vigor of the individuals that compose it.... The power of the State must be invoked, -- that is the collective action of the people through their properly constituted authorities... against ... dangers to the public health.

"Far down the future, I see a fair city rise.... It is not the city of God; it is this side of Jordan. It is the city of human possibilities, the city which men shall build at length, under the illumination of science and the inspiration of Christian love. In it your noble calling [i.e., the medical profession] shall reach its crowning triumph, for the healing of disease will there largely have given way to the prevention of disease."

I would like to turn now to Edward Orton's views of science and the scientific method. Some of these have already been quoted in our review of Orton's Inaugural Address.

In a paper published in 1898, Orton discussed the problems of science and scientific method in a more extended and formal way.<sup>10</sup> Dr. Orton wrote that

"Modern science is comprehensive. To its view, nothing in nature stands alone. It has learned that hard and fast boundaries are for the most part, arbitrary and unreal, mere human inventions and not wise ones at that. The isolation and independence of any subject are clear proofs that it is not understood. To be known, its origin, its history, its relations, must be brought to light."

Elsewhere in this paper, however, Professor Orton tends to deny that science is comprehensive. He excludes certain matters from the province of science and the scientific method:

"The deductive sciences that originated in [intuitive truth] were set in order more than two thousand years ago, and we can do very well with the arithmetic, geometry, logic, which took their forms then. It is the same with the great doctrines of jurisprudence and religion. Beyond the final and all-comprehending law of reason and righteousness which was laid down by Jesus of Nazareth, it is impossible to go. The whole was uttered then, and any other statement is but a repetition."

Dr. Orton's static view of knowledge in these areas was to be proven wrong by later developments in mathematics, logic, and the social and behavioral sciences. These limitations formed only a localized part of his general outlook. By and large, religious belief did not influence his scientific views. It was the other way around.

His overall optimism in regard to science was well-stated in an unpublished and handwritten manuscript that I was able to find in the Geology Library on the University campus.<sup>11</sup>

"It is impossible to set limits to the knowledge of the universe which the mind can acquire."

If Edward Orton's belief that human knowledge is a real cognition of the world, that scientific theory is meaningful, and that the growth of science is invincible -- If these beliefs seem to you self-evident or naive, I beg to differ.

To some, science needs to be drowned in technicalities and technical jargon. And the graceful cadences of Edward Orton's English prose would seem to be mere layman's language. This is not the case. Orton's views on the theory of knowledge evince the greatest precision and finesse. They were put forward by Professor Orton as a Christian and do not go as far as the propositions of his contemporaries in Europe, who, in the name of science, came to oppose religion itself.



There is value in comparing Edward Orton's scientific philosophy with that of his contemporaries in America, such as Charles S. Peirce and William James at Harvard, founders of pragmatism, a philosophy which focuses its attention on the limitations and alleged spuriousness of our knowledge.

The last years of Edward Orton's life were filled with honors. In 1897 he was elected President of the Geological Society of America. And in 1899, shortly before his death, he was elected President of the American Association for the Advancement of Science.

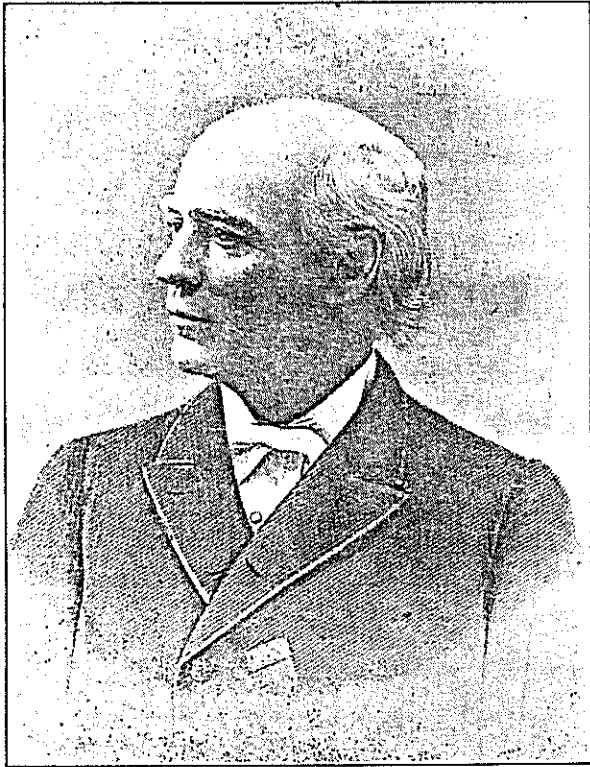
What is most noteworthy in the legacy of Edward Orton? His optimism, I would say, for science and for man's progress. The thought that the noise and strife of what he called his "little day" would be followed by something greater and better is met with again and again, all through his writings. His times were characterized by optimism, of course, but even, given that, the optimism of Edward Orton was more intense and more broadly based than his times alone can account for.

His modesty for his own day and his personal modesty together with his concern for liberal education and his confidence in the educability of youth all combined to sustain his belief that the future would be better.

It is now up to us to guarantee, in the words of the hymn sung this morning, that "These Things Shall Be."

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PROFESSOR EDWARD ORTON.

PROFESSOR EDWARD ORTON.\*

1829—1899.

A MEMORIAL ADDRESS.

BY WASHINGTON GLADDEN.

The genealogical history of "The Orton Family in America," a book of which Dr. Edward Orton was the author, begins with this paragraph:

"The surname ORTON is neither a common nor an unusual one. It is a name that could be heard without surprise in any community of English descent. It occurs in the directories of many cities of the country and can probably be found in many towns of the United States that have a population of 100,000 or more; but the list of Ortons is generally confined to a few individuals, and in many cases there is but a single family."

The name is found in Denmark, and Norway: there is at least one Norwegian family in Minnesota who brought the name from the Scandinavian peninsula. But it is more common in England; several localities in Leicestershire bear the name of the family; and since the larger number of the earliest settlers of New England came from the central and eastern portions of Old England it is fair to assume that Thomas Orton who settled in Windsor, Conn. between 1636 and 1641, belonged to the

Edward Orton became a life member of the Ohio State Archæological and Historical Society soon after its organization. He gave it much of his valuable time and took a deep and unremitting interest in its work and progress. He delivered many addresses at its meetings, and added much to its published literature. The officers and trustees of the Society freely counseled with him concerning the work entrusted to them. The secretary was often greatly indebted to Dr. Orton for suggestion and encouragement. A few weeks previous to his death Dr. Orton was elected a trustee of the Society, a position which had been many times offered him before. While characteristically disclaiming great learning in archæology, Dr. Orton nevertheless was regarded as a scholar of high authority in that subject. — E. O. R.

Leicestershire Ortons. That old town of Windsor, on the west bank of the Connecticut, a few miles above Hartford was one of the first English settlements in Connecticut; it consisted of a Congregational church which migrated bodily through the wilderness, from Dorchester in Massachusetts, and it is not improbable that Thomas Orton came with the first settlers. Here he was married, June 16, 1641, to Margaret Pratt; here he lived fourteen years, removing in 1655 to Farmington, a little further south. He seems to have been one of the most substantial men of that town; he represented it in the Legislature of the Colony in 1684, and held, as the records show, a considerable estate in valuable land.

This was the American founder of the family from which Edward Orton sprung, and of which he modestly says: "I do not find any clear proofs of commanding or distinctive qualities of any sort in the Orton line; but it seems to have furnished a good basis on which to build a fair average of New England or American character. Occasionally it has been happily blended with the blood of other families, and men of eminence have, as the result, risen above the rank and file of their day, but the great majority of the generations that have passed away have led unambitious lives, in peaceful country homes, far from the madling crowd's ignoble strife." Every Orton of to-day, has at least five generations of New England farmers behind him."

Of the descendants of Thomas Orton those most widely known in this country may have been Dr. William Orton, Edward Orton's second cousin, long the president of the Western Union Telegraph Company, and once United States Commissioner of Internal Revenue—a man of great executive ability; and Professor James Orton of Vassar College, a third cousin of Edward Orton and a naturalist of eminence, who was buried upon a little island in Lake Titicaca in Peru where he died while engaged in an exploring expedition in the interest of science. But we may safely say that far more luster has been given to the name of Orton by our friend and neighbor than by any one who has borne it on either side of the sea. The author of the Orton genealogy, with characteristic modesty, disposes of himself in a paragraph of a few lines which gives

not even a meager outline of his career. That chapter of the book must be re-written; for no name that it records is so widely known or so greatly honored as that of Edward Orton.

The grandfather of Edward Orton, Miles Orton, of Litchfield, Conn., was a soldier in the war of 1812, and died near the close of the war; his great grandfather, Samuel Orton, was fifty-two years of age at the outbreak of the Revolutionary war, and was not probably in active service, but the two eldest sons of Samuel Orton, Gideon and Samuel, great uncles of Edward Orton, were both revolutionary soldiers, and were both probably members of the regiment in which my own great grandfather enlisted in the spring of 1777. These three young men probably knew each other, and may have fought side by side at Germantown, and wintered together with Washington at Valley Forge.

Samuel Orton's father, Samuel, Dr. Orton's great-great grandfather, who was born in 1694, and who was one of the first settlers of Litchfield, Conn., was a captain of the militia company raised in his town for defense against the Indians. The family to which he belonged is thus proved to have been actively engaged in the Colonial wars, in the Revolutionary war, and in the war of 1812.

His father, Samuel Gibbs Orton, was born in Old Litchfield, in 1797, and there grew to manhood. The soil was sterile and life was a struggle; the death of Samuel's father when he was but sixteen left him the oldest of a family of eight, and threw upon him a heavy burden, but he was one of those whom burdens do not crush; and his manhood was invigorated under the strain. that hill country of western Connecticut seems to be adapted to the raising of men; five years later Samuel Gibbs Orton, and only three or four miles from his birthplace, Horace Bushnell was born; and John Brown of Harpers Ferry who was only three years his junior came from the first town north and was his fellow pupil in the Academy when he was preparing for College.

When these were lads, Lyman Beecher was the minister of the Congregational church at Litchfield, and it was under his pungent and strenuous preaching that Samuel Gibbs Orton was converted and began to prepare for college. His first year was

spent at Yale; then hearing of a young college in Oneida County, New York, where a poor student's chances to pay his way might be better than at Yale, he walked with all his earthly possessions on his back, all the way from New Haven to Clinton, near Utica, and entered Hamilton College, from which he graduated free from debt in 1822, having paid his college expenses by his labor.

The early years of Mr. Orton's ministry were spent in eastern New York and Delaware County; here he was married, in 1824, and here in the village of Deposit, March 9, 1829, Edward Orton was born. Failing health soon drove the young minister from these mountains, and he set out, on horseback, in search of a more genial climate in what was then the far west. Across the state of New York he journeyed, gaining strength as he went, and when on the heights of Chautauqua he saw the broad expanse of Lake Erie with its fertile slopes he felt that he had reached the promised land and dismounting from his horse he lifted up thanksgivings to the Providence which had brought him in safety to a country so fair. Hither his little family soon followed him, when Edward was only four years old; and here to the labors of an evangelist among the weaker churches of Chautauqua County, Samuel Gibbs Orton devoted a number of years. From these labors he was called to the Park Street Presbyterian church of Buffalo, where he spent a few years, but when Edward was eight years old he returned to Chautauqua County, the Presbyterian church of Ripley, the westernmost town of New York, on the lake shore, having offered him its pastorate. "Here," says his son, "Mr. Orton remained for sixteen years, interested in and serviceable to every phase of the life of the people, religious, moral, intellectual and natural. He fitted a number of the young men of his parish for college. He established and maintained in the town a private school, which was the equivalent of an academy, and which exercised a refining and uplifting influence upon the community to a notable extent."

This, then, was the early home of Edward Orton, and these were the influences in which his life was nurtured. It was a country minister's home—a home in which learning and religion went hand in hand; where, if the theories were severe, the ideals

were lofty; where plain living was joined with high thinking. Edward Orton was constrained, in later years, as we shall see, to cause his father great sorrow in following his own convictions of religious truth; but his own words bear testimony to the honor in which he held his father:

"Mr. Orton," says his son, "was a man of excellent gifts in many directions. He was not what would be called a great or profound preacher, but he was an unusually persuasive and successful one. He was sincere and earnest. He had a wonderful knowledge of human nature, by which he always adapted himself to the audience which he was addressing. He had the practical talent of the genuine New Englander; had as much knowledge of farming as any farmer in his parish, and almost the same could be said of him in many other lines of business. To the end of his days he had an eager love of nature and of man; was hospitable to all new thought so far as it did not seem to him to be inconsistent with the theological tenets which were, to him, the most vital and important facts in the universe. His kind and sympathetic nature made him universally beloved."

The boyhood of Edward was thus spent in an environment most friendly to health of body and purity of soul, and manliness of character. In the rural home, as he testifies, "he acquired a knowledge of and a life-long interest in country life. He often worked by the day and sometimes by the month, among the neighboring farmers," giving his winters mainly to study. Partly by his father, and partly by the two academies of Westfield and Fredonia, he was fitted for Hamilton College, which he entered, as Sophomore, when he was sixteen, graduating, in 1848, at the age of nineteen. Hamilton College, at that day, as I well remember, was regarded as one of the best of the higher institutions of learning; it was only seven years later that my own choice of a college was made, and Hamilton was the one to which my thought was first directed. The scientific department was not strong; in that respect it was like all the rest of the colleges of that time; but its reputation for some kinds of work was very high; no better training in language and literature, in writing and speaking was given anywhere. The curriculum was that of the old-fashioned college—Greek and Latin and mathematics, rhe-

toric and oratory, a little history, some philosophy, and the rudiments of natural science, with considerable astronomy—"the observatory at Hamilton has been famous"—what was called a liberal education—an all-round training, which opened quite a number of windows through which a man might look out on life, and instead of making him a specialist, sought to lay a foundation of general knowledge on which, if he chose he might build his specialty in after time. I think that that old-fashioned training has demonstrated its value in the life of Edward Orton. It gave him, to begin with, a most admirable instrument for his work, in a literary style, clear, elegant, forcible, the perfection of good English,—a style by which he could illuminate any subject of which he treated; and it gave him also a breadth of outlook, and a comprehensiveness of judgment which rendered his scientific work more worthy of acceptance. Edward Orton, at any rate, never despised the training which he received in this old-fashioned college; he kept his interest in the subjects which he studied there and his knowledge of them; since I have been in Columbus he has taught Latin in the Preparatory Department of the University, and some of his pupils have told me that he was the best Latin teacher they ever had; and he was for some time the instructor and a most admirable instructor in the art of public speaking. I am not inclined to believe that he was any less successful as a specialist in geology because he was a broadly cultured man. Certainly he was worth to the world a great deal more than he would have been if he had known nothing but geology. Those who know testify that his voice from the beginning has been for breadth of training in our own university. Dr. Chamberlain, writing in the "Ohio Farmer," tells us that when the Grange and other agencies in the earlier days urged more of practical agriculture in the curriculum, his courteous answer always was: "I think we should first lay broad foundations of general culture and science, and specialize later as funds increase and the demand arises." It was well, I think, that a man with such a training was at the helm in the first years of the life of our university.

He was a mere youth when he came out of Hamilton College. Not often is the baccalaureate won at the age of nineteen.

His purpose in life was clear; he was on his way to the Christian ministry, and the year after his graduation—(he taught, I think, part of a year in Cincinnati)—he entered Lane Seminary in that city, of which Dr. Lyman Beecher, thirty years before his father's pastor in old Litchfield, was then the presiding genius, and in which Lyman Beecher's son-in-law, Calvin E. Stowe was one of the professors. About that time Mrs. Stowe must have been gathering her material for "Uncle Tom's Cabin." It was a time of intense intellectual activity. The antagonistic forces which met, only a decade later, in the mighty struggle of the Civil War, were then angrily confronting each other; Clay's compromise measures, by which he vainly sought to avert the impending conflict, were passing through that great debate in Congress; Seward and Chase and Hale were standing and voting together in the Senate for the restriction of slavery, against the combined strength of both the great political parties. It sounds a little queer, to one who watched that conflict, as I watched it, to hear the political descendants of Seward and Chase and Hale sneering at independency in politics! Men like Theodore Parker and Henry Ward Beecher and William Lloyd Garrison and John G. Whittier were challenging the divine right of slavery and disputing the traditional interpretation of the Bible on which it rested. Something of the fermentation of the time was in the mind of Edward Orton; the theological traditionalism of that school of the prophets in which he was studying seems to have laid upon him a burden heavier than he could bear. He heard a sermon, one Sunday, on the condition of the heathen world, which consigned to a hopeless doom all who die without the knowledge of the historic Christ, and the injustice of the dogma made him angry: he told the professor with whom he walked home from church that it was a horrible doctrine—that he could never preach it. From this time his mind was full of questionings; he did not care to continue his studies at Lane. Some failure of eyesight also complicated his problem; he seems to have turned aside to farm-work for a year or two to recover his health. Meantime he had heard of a seminary on Andover Hill in Massachusetts in which, as was reported, a broader theology was taught; indeed grave suspicions of heresy attached to some of the instructors,—

but the young theologian was less afraid of heresy than of heathenism in theology, and he made his way thither, pausing however by the way, for what reason I know not, to study chemistry for six months in Harvard, under Professor Horsford. At Andover he completed his theological studies. Edward A. Park and Austin Phelps were the brightest stars in the Andover constellation at that time; their theological method was somewhat more modern than that of Lane; they sought a rational view of Christian doctrine, and Edward Orton was able under their guidance to hold on to his purpose of preaching the gospel. Soon after leaving Andover he was ordained to the ministry of the Presbyterian church, and accepted the pastorate of a church in the secluded village of Downsville, in Delaware County, New York. Of this ministry we have but slender records. Dr. Orton was reticent about this experience. It would be perfectly safe to say that he was an earnest preacher and a faithful pastor; that his deep sincerity and his strong human sympathy must have given him great power in the work of winning men. Nevertheless it was a period of storm and stress; his theological difficulties deepened; many of the things which he was expected to teach came to bear for him an air of unreality; at length, after a struggle whose nature we can guess,— and can only guess, because he has not chosen to share with his friends his mental disquietude — we find him turning from a task that had become to him impossible, and entering, in 1856, upon his life work as a teacher in the State Normal School at Albany.

He had given up the ministry, but he had by no means parted with his religious purpose; he connected himself with the First Presbyterian church of Albany and taught a large Bible class in the Normal School. After a while it began to be noised abroad that the teachings of this Bible class were not following the beaten track. What was the nature of the divergence charged against him I do not know; it may, very likely, have been some conflict between his science and the traditional interpretation of the Book of Genesis. This was a time when strenuous efforts were made to reconcile Genesis with geology; such books as Hugh Muller's "Testimony of the Rocks" and Pye Smith's "Scripture and Geology" held fast to the historical and scientific accuracy of

the early chapters of Genesis and sought to make them agree with the facts of modern science. Of course it was a hopeless undertaking; those chapters do not tally with the testimony of the rocks and it is not improbable that Edward Orton said so. It would be hard to find a professor in any Congregational Theological Seminary in the world to-day who would not say the same thing; but in those days such a statement was flat heresy, and Professor Orton found himself under a cloud. He had been assisting, with great acceptance to the pupils, in conducting morning worship in the chapel of the Normal School; he found that his assistance in this service was no longer requested, and on inquiring of the authorities the reason of this change, learned that they did not deem him a fit person to lead the devotions of the school. At once he resigned his position, and his resignation was accepted. Some account of this transaction is found in a correspondence which appeared in the New York Tribune of June, 1859. A letter signed "Jefferson," was printed in that paper, June 17, which states that some three or four years before a young Presbyterian clergyman had been appointed professor in the State Normal School at Albany; that he had fine talents for teaching and because of his religious character had been appointed to take charge of a Bible class of pupils; that he had been removed from the charge of this class on account of his religious opinions, because he no longer believed in all the doctrines held in the church to which he belonged; that Presbyterian clergymen in town were aware of his changed views, and that the principal of the school, probably moved by them, had, though with much reluctance, made the heresy of the professor an objection to his continuance in the school. "It was not alleged," says the writer, "that he obtruded his religious opinions upon the scholars, or in any way sought to make proselytes; neither was it objected that his character as a truly religious man and a faithful teacher, was in the least degree impaired. On the contrary he was, if possible, more than ever beloved and confided in by his pupils and was acknowledged by all to be the most popular teacher in the school." But outside influence had undoubtedly demanded his separation from the institution. The

Albany Presbytery had arraigned him on a charge of heresy. The principal of the school continued his importunities upon the professor to resign his place, admitting that public opinion could never sanction his removal from office on account of his religious opinions. "The result is," said the writer, "that the professor has been compelled by persistent annoyance and persecution to resign and will leave the school at the end of the year. Here is religious liberty violated in a state institution, against the constitution of the state, which declares that no discrimination or preference shall be allowed in the matter of religious opinions." The state superintendent of public instruction had, the writer testifies, freely denounced the performance, as wholly unsanctioned by him.

To this statement the following reply by Dr. Orton appeared in the *Tribune* of June 24, 1859:

"A letter bearing the date of June 13, 1859, over the signature of 'Jefferson,' appeared in the *Tribune* of Friday, June 17, relating to the resignation of one of the professors in the State Normal School. The reference to me as the teacher alluded to was unmistakable, and I therefore take the liberty over my own signature to call attention to some statements which may do injustice to the principal of the school. Exception can be taken to that section in the letter which asserted that I was 'removed' from the charge of the Bible Class which I had for several terms conducted. The facts which led to the cessation of my connection with it can be briefly told. In the summer vacation of 1858 I wrote to the principal stating in substance that my religious views had changed in some respects, since I undertook the conduct of the class, and that while I should be glad to go on with it I did not feel at liberty to do so without mentioning the matter in this way to him. I further stated that I should not resume the class without an intimation from him to the effect that he wished me to do so at the beginning of the term. I was not invited to resume the charge.

"The second of these strictures is this: 'The principal of the school (apparently with much unwillingness) began to make the heresy of the professor an objection to his continuance.' In the course of conversations which I myself commenced with the

Principal, entirely similar in character to conversations which I had been accustomed from time to time to hold with him during all of my connection with the school, I was led to infer that the change in my religious views was likely to affect the tenure of my office. I received my appointment to the professorship which I have held through the influence of the Principal, and I have considered myself bound in honor to resign my situation at any time he should desire it. When, therefore, I was obliged to conclude that my continuance in the school was no longer desired, I deemed it necessary for me to offer my resignation. In regard, then, to this paragraph, and to others which I shall immediately quote, I have to say that at no time have I been importuned or even requested to leave the school. The language employed in the conversations which I sought, and to which I have already referred, was carefully guarded, while, at the time, I must add that no requests, persuasions or importunities could strengthen the impression made upon my mind that it was desired that my connection with the school should be brought to an end.

"The remaining sentences of the letter to which I wish to refer, are these: 'The Principal of the school continued and increased his importunities upon the professor to resign his place, admitting all the while that public opinion would never sanction his forcible removal from the office on account of his religious opinions. The result is that the professor has been compelled by persistent annoyances and persecutions to resign, and will leave the school at the end of the present term.' The statements which I have made in the preceding paragraph apply especially to the first of these sentences and to the word 'persecutions' in the last. There remains a single phrase which is, perhaps, most liable of all to misconstruction. It is this: 'Persistent annoyances.' Annoyances were, of necessity, attached to my position, but that they were of such a nature as an ungenerous man could inflict upon a subordinate in position, I gladly take this opportunity to deny. The personal treatment which I have received during all the time in which my retirement from the school has been contemplated has been, in the highest degree considerate and kind.



"I have only to add that were it left for me alone to choose, even the interest which I cherish in the principles involved in this matter would be hardly sufficient to overcome the reluctance which I feel to achieving such kind of notoriety."

It seems, at this day, almost incredible that such a man should have been compelled for such a reason to give up a good work in a state institution which he was undoubtedly performing with the greatest skill and success, but that was a day when the heresy accuser was abroad in the land and he was a mighty man of war, armed with bows and arrows and slings and sharp spears. There was little mercy for those who aroused his suspicion.

From Albany he was called to the principalship of Chester Academy, in Orange county, New York, where he wrought for six years, with all good fidelity and to such purpose that his name became widely known, so that in 1865 he was called to a professorship in the college which Horace Mann had made famous by his consecrated labors, and from whose presidency Thomas Hill had recently retired. Antioch College was in those days one of the most promising of the western institutions, and the call was a distinct promotion for Mr. Orton. But it was, at this time, under Unitarian control, and the acceptance of a professorship in it signified the identification of the professor with that denomination. To his good Presbyterian father, who had then retired from the ministry and was dwelling in retirement in northern Pennsylvania, this was a terrible calamity—almost a tragedy. He could not regard his son's action in any other light than that of apostasy; for a long time he could neither be reconciled nor comforted. At length, however, he was persuaded to visit Yellow Springs, and after a few weeks spent in the home of his son, the father returned to his own house greatly reassured and quieted. One cannot help pitying the good man in his agony of soul over the departure of his son from the orthodox fold, yet one must wonder at the blinding power of a theological prejudice, which could fill the heart of a father with mortal fear for the fate of a son with a faith as firm and a character as Christlike as that of Edward Orton.

Of the work of Dr. Orton at Antioch I can give no adequate report. I meet men and women, now and then, who were his pupils there, and I have never met one who did not speak of him with filial affection. Doubtless it was a good service that he rendered there, as everywhere. On the resignation of Dr. Hosmer in 1872 he was made president of Antioch; a year later he was called to the presidency of the new "Ohio Agricultural and Mechanical College," now the Ohio State University.

The remainder of his life—more than a quarter of a century—has been spent among us; it has been an open book, known and read of all men. For eight years he held the presidency of the College, which in 1878, became the University; since 1881 he has been professor of Geology. In 1869 he was made one of the assistants of Professor Newbery, the state geologist; since 1882 he has held the honorable position vacated by the latter, and seven thick volumes of geological reports will forever connect his name with the physical history of the State of Ohio. The statistical, geographical and scientific portions of the article "Ohio" in the *Encyclopedia Britannica* are also from his pen.

Such is an imperfect outline of this busy life. The difficult and delicate task remains to me of offering some estimate and appreciation of the significance and value of this life.

1. Of the scientific work of Dr. Orton I am not, of course, qualified to speak. I only know that he was held in high esteem by his contemporaries and associates in scientific study; his selection last year to the presidency of the American Association for the Advancement of Science is evidence enough of that fact. It was to him a most gratifying recognition of his honorable career, and I am sure that there was not one of his neighbors in Columbus whose heart was not warm with thankfulness and pride when this honor was bestowed on him. It was a fitting and beautiful thing that his life should be crowned, at the end of his days, and in the presence of those who loved him best, with this high distinction.

All I can say about his scientific attainments is that he knew how to make the subjects of which he treated profoundly interesting. The lucidity of his exposition, the quiet eloquence of his presentation clothed all these themes with light. And his words,

whether written or spoken, always made the impression that the matter had been well weighed; that the evidence had been thoroughly sifted; that the induction was as broad as he could make it; that it was safe to trust his judgment. Some of his addresses—that upon “The Stored Power of the World”; his Alumni address at Hamilton College, in June, 1888, on “The Method of Science and Its Influence Upon the Branches of Knowledge Pertaining to Man,” and notably that great oration, not yet printed, which was heard once from this pulpit, on “Man’s Place In Nature,” are examples of the luminous presentation of the great facts of science which will take rank with the best that has been done along this line in this generation.

2. Of his work as a teacher the testimony is full enough so that one may speak with no reserve. Unquestionably he was a great teacher, full of his subject, full of the passion for truth, full of the intellectual sympathy which enabled him to put himself *en rapport* with his pupils, to know how they needed to be helped, and by what methods of approach to come into close contact with them. I have never heard any pupil of his speak in any other than the most enthusiastic terms of his ability as a teacher.

His conception of education was large and high. He was a scientific man, and he had the strongest faith in scientific methods of study, but he was far from believing that nothing is worth knowing except the physical sciences. His plea for the broader culture in his inaugural address as President of the Ohio Agricultural and Mechanical College is one of the best things he ever said. He is urging that education must be practical:

“What shall be said,” he demands, “of the study of language, especially of our own? Is not the power to make clear, accurate intelligible statements of what we know or what we think a practical power? Does not our education show itself glaringly defective when it leaves us without this ability? Men with knowledge and ideas, but without the power of adequate expression,—like lumber wagons loaded with gold—never pass for what they are worth in this world. But this power to use language with precision and efficiency, and still more the ability to endow it with persuasive force, does not

come to us in dreams. There is no royal road, no short cut to good English. It is one of the choice fruits of education. If obtained at all it must be bought with a price, the same price that is paid for solid attainments in any other department of knowledge, patient and extended study. Can such study be left out of a practical curriculum?”

Again he is pleading that education must be liberal:

“What is a liberal education? Aristotle first used the term which we thus translate, and by it he attempted to designate an education fit for a freeman. He might justly have included an education that should give freedom to its possessor, that should liberate him from the narrowness, and prejudice, and isolation, the slavery of an uneducated mind. Something at least of this meaning has always been retained, and to-day the conception of a liberal education that would be accepted by the largest number would be found to include the education of man as man rather than that which equips him for a particular post of duty; the education that concerns itself with the broad substratum of general knowledge rather than the special applications of knowledge to some isolated field; the education that aspires to a symmetrical and balanced culture of all human faculties rather than that which selects one set of faculties for training and leaves the rest to accident or atrophy; the education that imbues the mind with a generous sympathy for every department of knowledge and that recognizes the contributions of each department as necessary to the perfect whole, rather than that which transforms its possessors into narrow and conceited specialists, mutually intolerant of each other’s and of all others’ work and claims. Can we, indeed, improve upon Milton’s ideal of a liberal education? ‘I call, therefore, a complete and generous education that which fits a man to perform justly, skillfully and magnanimously all the offices, both public and private, of peace and war.’”

No better statement of what education means is likely to be made than this. It ought to be printed in large type and framed, and hung in the halls of the University and of every high school and academy in the State of Ohio.

3. I have already alluded to his admirable English style and the quotations that I have given and shall give, will render superfluous any extended comment on his merits as a writer. There is never any straining after effect; he is no mere phrase maker; he has something to say, and he says it in perspicuous, balanced, musical English. His learning is never obtruded but it often illuminates his sentences; out of the abundance of his knowledge of the best that has been said in books he brings forth treasures new and old; and a subtle and benignant humor often plays like a lambent light over his dignified pages.

His speaking, too, was excellent. He did not like to speak without notes; he was freest and most effective with his address before him, but he gave it with such naturalness and ease, such fine modulations of a sympathetic and persuasive voice, that no muscular effort and no spectacular demonstrations were necessary to seize and hold the undivided attention of the auditors.

4. Of his relations, as a citizen, to the city, the state and the nation, there is much to say, but that topic will be treated adequately by another; I can only touch it. If Dr. Orton could not be described as the scholar in politics, he was surely a scholar to whom the public welfare was a matter of the deepest concern. He was counted, I suppose, as a member of one of the political parties; when there were not sufficient reasons to the contrary he voted for the candidates of that party; but there were often sufficient reasons to the contrary. He was no blind partizan; the misdoings of his own party hurt him quite as much as those of the other, and he saw them just as distinctly and punished them at the polls. No man kept closer watch of the great movements in the political world; no man loved his country with a more passionate love, or sought more diligently, in unobtrusive ways, to form that sound and sane public opinion by which the questions of state shall be wisely settled. In city affairs he was always interested, and the deplorable and shameful failure to find the best men and put the control of affairs into their hands caused him the keenest mortification. It would be well if the people who assume the care of our municipal interests, and who, in many cases, make it only too evident that they have none but selfish ends in view, could see themselves as Edward Orton always saw

them. Yet he was not despondent; he looked, even in the darkness of this decade, for a New Columbus to descend out of heaven from Góð. In that benignant message which he uttered at the banquet given to him on his seventieth birthday he put together these questions and answers:

"What is the outlook, do you ask, at the end of threescore years and ten, as to the conditions of society? How do the prospects of humanity appear? I am glad to testify that the outlook with me is on the whole hopeful and inspiring. I feel sure that the pathway of man is still ascending. He is certainly coming to wider vision and wider control of nature. Here, in our time and place, it would be ostrich-like stupidity, it would be worse than Christian Science, to deny the existence of evils that assail and threaten the social state. But I feel confident that the coming generation will grapple with all these dangers and difficulties with manly courage, and that every one of them will yield at last to a fair, just and considerate treatment."

How much sounder, how much truer is this clear-eyed confidence than that half-despairing note with which Ruskin's message closed or the rueful pessimism of Tennyson's second Locksley Hall!

And now, as I draw still closer to my theme, and seek to unveil the hidden sources of this personality, a sense of its sacredness makes me loth to speak lest something extravagant or unworthy should be said.

Let me give you first a few words of testimony from those who knew him long ago. Dr. Thomas S. Hastings of New York City, an honored and well-beloved Presbyterian pastor, for a long time the President of Union Theological Seminary, writes me thus:

"You ask me to write you concerning the college life of my classmate the late Professor Edward Orton, LL. D.

"He entered the class of 1848 at the beginning of our Sophomore year. He was singularly modest, retiring and reserved, but we soon discovered his marked ability. As a scholar he went at once to the front and maintained his position to the end of the course as the finest scholar in the class. He seemed to me a serious, deeply earnest and sincere man. He did not min-

gle in college sports or collegé politics, and yet he commanded the respect and confidence of all. Two years ago, at the fiftieth anniversary of our graduation, Dr. Orton was the 'class annalist,' and his kindly and discriminating review of the characters and careers of our classmates, showed the keenness of his perceptions and the charming sweetness of his nature. I have followed his public career with affectionate interest, and though I could not always agree with his published opinions I have always believed in him and loved him as a profoundly good man."

Dr. John Bascom, who knew him a little later, sends me this testimony:

"I met Professor Orton first in Andover Theological Seminary. We spent one year, — 1845 — together there, though not in the same class. We were drawn to each other by an incipient freedom of religious belief, and by the pleasure we took in outdoor excursions. For fifteen or twenty years after we left the Seminary I saw nothing of him and hardly heard from him. Later we became regular correspondents and interchanged visits.

"Dr. Orton had a diligent, penetrative and comprehensive mind. He did what his hand found to do, and the world lay open to his hand on many sides. He took as constant and warm an interest in all the questions pertaining to our spiritual life as any man I have ever known. The consequence was that few religious beliefs satisfied him, and he was ever anxious to lay better foundations of faith. 'The Natural History of the Christian Religion' by William Mackintosh was a book to which he attached the highest value. It is remarkable for the tenacity of its faith, and at the same time for the breadth and thoroughness of its criticism. I have felt that the reason of Dr. Orton's attachment to me lay chiefly in the fact that having given myself less to physical inquiries, and never having been victimized by empirical philosophy, I was able to bring more confidence to spiritual truths and increase his courage in this direction. No change of belief with Dr. Orton was the result of indolence or indifference. He first brought to my attention 'The Religion of Israel' by Kuenen, a book fitted to greatly modify one's interpretation of Scripture.

"As a friend Dr. Orton was very considerate and self-sacrificing. His inimitable courtesy and sweetness of voice opened a path before him like sunshine. Few men are found so uniformly fitted to do good and to avoid the evils of belligerency as was he. His usefulness and his success lay almost exclusively in his own personal endowments."

The perfect courtesy to which Dr. Bascom has referred was something more than manners, it was character. We beheld in it the natural expression of a just, benignant, gracious personality. It was never effusive; it was dignified, it was a little stately, but the stateliness was not to display himself but to honor you. And how much there was of considerate and helpful kindness in his life; how many things that he thought of saying and doing which brought strength and courage and consolation in the hours when he needed them most. All who wrought to relieve suffering and minister to human need found in him a helper; to the end of his life he was actively interested in all kinds of philanthropic work.

I have spoken of the change in his religious opinions. It must not be supposed that this change involved any loosening of his hold on the fundamental verities of religion. I have been reading in manuscript a few of Dr. Orton's sermons, written and preached after he went to Yellow Springs, and I am sure that there is nothing in any of them that would not be welcomed as good gospel in any church in Columbus today. There is a sermon from the text, "Be not weary in well doing, for in due season ye shall reap if ye faint not," which lays down in the clearest manner the great laws of the spiritual life, insisting that the true well-doing involves obedience to both the great commandments. "Men frequently argue," he says, "that the sustaining of right relations to each other is all that is required, that no charge can stand against that life which fulfills the demands of what is commonly called morality. In opposition to all such half-truths the commandment comes, 'Thou shalt love the Lord thy God with all thy heart.' We cannot love our fellow-men as ourselves aright without loving God first and supremely. We can never set a right estimate upon human nature in ourselves or others, only as we have had a vision of its divine original.

There is no well-doing possible that leaves God out of the account."

There is a noble sermon on the text "Blessed are they which do hunger and thirst after righteousness." Very impressive is his enforcement of the truth that the deepest craving in man is his hunger for soundness and perfection of character, and that the way to find it is the way of Jesus. "With the spirit of the great Master in our hearts," he closes, "we cannot miss the real object of our lives. That such a spirit has entered into this world is the best pledge that we have of another.

"Here is righteousness—to live in the spirit and temper of Jesus of Nazareth:

"And Him evermore I behold  
Walking in Galilee,  
Through the cornfield's waving gold,  
In hamlet, in wood and in wold  
By the shores of the beautiful sea.  
He toucheth the sightless eyes,  
The demons before Him flee;  
To the dead he sayeth, 'Arise!'  
To the living, 'Follow me!'"

Still another sermon from these last words, "Follow me and I will make you fishers of men," which was first preached as the baccalaureate sermon to the graduating class in this church in 1880, and which was repeated in the college chapel in March, 1888, is broadly and deeply and grandly Christian from beginning to end.

In his ways of stating some of the Christian truths Dr. Orton would have differed from many who call themselves Christians. The miraculous elements in Christianity were not so significant to him as they are to some of us. Yet even concerning these he said in his last great address on "Man's Place in Nature": "For myself I have no objection to miracles, in themselves considered, so that they are properly supported. As far as our present knowledge goes the entrance of life into the world was a miraculous event."

His faith in a personal God was clear and unwavering. "If," he says, "life, personality, reason, conscience, imagination

come from nature, then nature has in it a supreme, personal, rational, moral element. In other words, God is in nature. Personality cannot spring from anything less than, lower than itself—the stream cannot rise higher than the fountain from which it flows."

His belief in Jesus Christ he might not have chosen to put into your words or mine. Let us not ask him to do any such thing. Let us permit him to express it in his own way. In his address at Hamilton College eleven years ago he said: "Beyond the final and all comprehending law of reason and righteousness which was laid down by Jesus of Nazareth it is impossible to go. The whole was uttered then, and any other statement is but a repetition."

In the noble speech on "Man's Place In Nature," he speaks of the great forces of good will and kindness which are changing the character of our modern civilization, saying, "This view of life and man has, I need not say, a historic source. There was a date when it was first announced, a point on the face of the earth from which as a center the message worked its way outward. We follow it back with absolute certainty to Jesus of Nazareth. He taught the new doctrine in words, he taught it still more impressively by his life and by his death. The Christian ideal of character can be traced as definitely to this source as the Declaration of Independence to Jefferson or Magna Charta to the barons. The ideal is bound to inherit the earth. It is the noblest conception of man and the universe that the mind has ever reached."

And again in the baccalaureate sermon, quoting the bold words of the Fisherman of Galilee who calls to us: "Follow me!" he asks whether, after all the lapse of years and the growth of art, and the spread of science and the triumphs of civilization, there may not now be some one who could more worthily utter these words, and his answer is: "No, no. This art the Nazarene has inspired. Science has grown only along the pathways he has trod, and all that is most characteristic and permanent in modern civilization has its origin in him. He stands to-day further in advance of our highest thought and

attainment than he seemed to stand in advance of the fishermen of Galilee."

Of the great hereafter he thought much, and in years past somewhat dubiously. There was no dogmatic disbelief; there was a yearning hope that almost reached conviction, but a shadow lay upon the future, and he would not confess a belief for which there was not adequate ground. But in later years this hope has steadily grown to assurance. With him, I suppose, as with Fiske and Romanes, the larger implications of the doctrine of evolution brought a kind of certitude he had never found before. In that swan song of his, at the birthday banquet, are these questions and answers, which give us his latest and ripest thought.

"What is the outlook," he imagines his friends asking him, "at your time of life, as to the individual future? Does the old man get any nearer than the younger ones to an answer to the great question, 'If a man die shall he live again?' Here, too, I am glad to say that the hope grows stronger as the years go by, that a being of such unmistakable alliance with divinity as man, with the godlike endowments of reason and conscience, may hope to emerge even from the shock of death unharmed. I have a growing respect and reverence for man as man. The spiritual difference between him and the rest of the creation seems infinite. He belongs to the higher side of the universe and will share its great destiny. I am sure that we often think too meanly of ourselves. Tennyson expresses my faith in the well known lines:

"Thou wilt not leave us in the dust,  
Thou madest man, he knows not why;  
He thinks he was not made to die,  
And thou hast made him, Thou art just."

"Or, as expressed by Mackintosh: 'If through the cosmical and evolutionary process the Great Unseen has been able out of the primordial elements to bring beings into existence akin to himself, may it not be hoped that these same beings may be fitted for a life beyond the limits of a finite duration?'"

On that quiet Sabbath, which was his last full day upon earth, he seemed to be aware that "the shadow, feared of man,

who keeps the keys of all the creeds," was lurking near, and he met the challenge without a tremor.

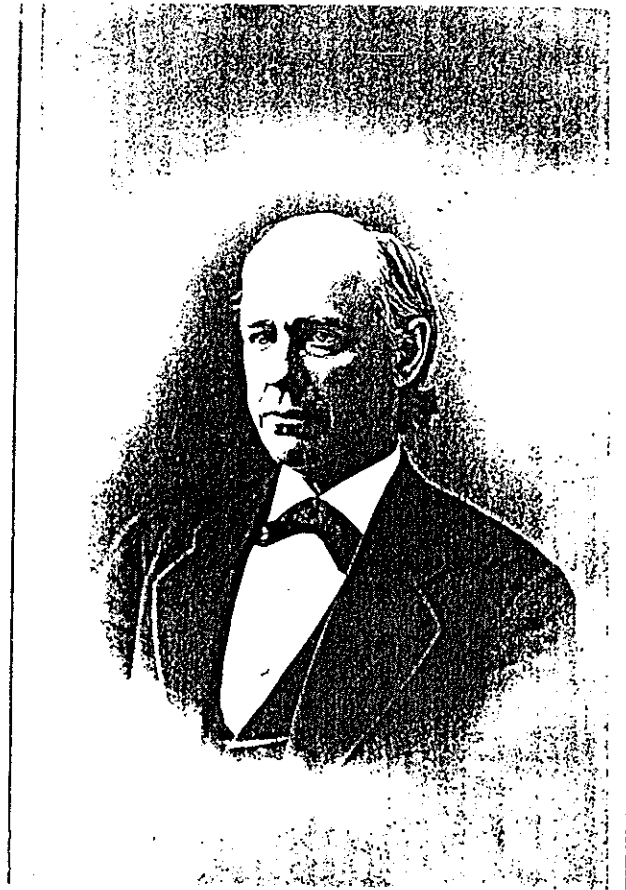
"Do you know," he said to one member of his family some time during the afternoon, "do you know that poem of Browning's about death—'The fog in the throat, the mist in the face?'" It was looked for, but was not found then, and the matter was dropped. As the evening drew on, another member of the family was sitting with him, and he mentioned it again. This time it was found and read to him, and he listened with keen interest. A little later this daughter went out and the other came in. "There is that poem of, Browning's—'Prospice,'" he said. "Won't you read it to me?" She read it, and after a little his wife took her place by his side. "Do you remember," he said to her, "that poem of Browning's about death? It is there. I should like to hear you read it." The third time it was read to him. None of them knew that the others had been asked to read the poem. Was it not the word that uttered his own deepest feeling about death:

"Fear death? To feel the fog in my throat,  
The mist in my face,  
When the snows begin and the blasts denote  
I am nearing the place,  
The power of the night, the press of the storm,  
The post of the foe;  
Where he stands, the Arch Fear in a visible form,  
Yet the strong man must go;  
For the journey is done and the summit attained,  
And the barriers fall,  
Though a battle's to fight ere the guerdon be gained,  
The reward of it all.  
I was even a fighter, so — one fight more,  
The best and the last!  
I would hate that death bandaged my eyes and forbore,  
And bade me creep past,  
No! let me taste of the whole of it, fare like my peers,  
The heroes of old,  
Bear the brunt, in a minute pay glad life's arrears,  
Of pain, darkness and cold.  
For sudden the worst turns the best to the brave,  
The black minute's at end,

And the element's rage, the fiend voices that rave  
Shall dwindle, shall blend,  
Shall change, shall become first a peace, then a joy,  
Then a light, then thy breast,  
O thou soul of my soul! I shall clasp thee again,  
And with God be the rest!"

Thus it was that he welcomed death, and passed to where, beyond these voices, there is peace. The thoughts of these last hours were not unfamiliar thoughts; the one who knew him better than any other could have known him testifies that he was the most devout soul she has ever known; that while he never wore his faith upon his sleeve, his deepest and most constant interest has always been in the things unseen and eternal. He has gone, as we believe, to stand among those who no longer see as in the blurred mirror, dimly, but are face to face with the eternal realities, in the light of God—in that fuller revelation for which his soul was always athirst. The world in which he lived is a better world for us, and for many others, because he has lived in it, and the world to which he has gone is dearer and nearer and purer since he has passed within its portals.

"Unnoted as the setting of a star  
He passed; and sect and party scarcely knew  
When from their midst a sage and seer withdrew  
To fitter audience, where the great dead are  
In God's republic of the heart and mind,  
Leaving no purer, nobler soul behind."



(A) Born in Deposit, New York in 1829 and graduated at age 17 from Hamilton College in New York, this ordained Presbyterian minister became the first president (1873-1881) at The Ohio State University (OSU), known then as the Ohio Agricultural and Mechanical College. Prior to becoming president, he had been a professor of natural history and then president of Antioch College in Yellow Springs, Ohio. His teaching specialties were geology, mining, and metallurgy. While president of OSU, he was a professor and a department head in geology. When he resigned in 1881, he retained his geology professorship until his death in 1899.

This president supported the idea of the College becoming a University, even though many opposed it. He felt very strongly that we were wasting our supplies of coal, oil, and natural gas and someday these resources would be exhausted. Conservation was his battle cry!

He was married twice. His first wife, Mary Jennings, died in 1873 and he was remarried to Anna Torrey in 1875. His son graduated from OSU in 1884 and became a professor at the University in 1894, heading up the new department of ceramics and clay working.

The above photo and caption were used on the Bulletin Board display in the Main Library during Fall Quarter, 1990. bli: 9/90



EDWARD ORTON

1829-1899

Hamilton College, Class of 1848  
Lane Theological Seminary, 1849-50  
Lawrence Scientific School, Harvard, 1852-53  
Andover Theological Seminary, 1854-55.  
Pastor Downsville, N. Y. 1855-56  
Professor State Normal School, Albany, N. Y., 1856-59  
Principal Chester Academy, N. Y., 1859-65.  
Professor Antioch College, Ohio, 1865-72  
First President Ohio State University, 1873-81  
Professor of Geology, 1873-99  
State Geologist of Ohio, 1882-99  
A teacher beloved by students and faculty a President  
Esteemed and honored by Trustees, a scholar devoted to  
Science and its applications to economic problems, a  
Philanthropic citizen whose counsels guided the city. . .  
As first President, he laid the foundations, outlined the  
policy, and gave character to the University he served  
for twenty-six years.  
This building, erected in 1892 under his guidance and dedi-  
cated to his memory, is named



Orton, '48

## ONE HUNDRED YEARS AGO . . .

Ohio's Huge State University Grew From the Labors of a Hamilton Man Who Preferred Studying Rocks to Running Colleges.

Back in 1873, when Ohio launched its Agricultural and Mechanics College and began talking about creating a State University, it needed the best man it could find for president.

Its choice was a graduate of Hamilton in 1848—Edward Francis Baxter Orton.

Today's Ohio State University in Columbus has been described as a monument to his leadership.

Son of a Presbyterian minister who had himself graduated from Hamilton, Orton came to College Hill as a youngster of 16, making the then long trip from Buffalo by canal packet.

After graduation he wavered between science and religion, ending as an ordained Presbyterian minister with a postgraduate year of science at Harvard. He took a parish briefly, but then switched to teaching. He switched his religion, too, and fast became too Unitarian for Albany Normal where he taught natural science. Eventually, he went to Antioch College which in 1872 made him its president.

Then came "the call" to the budding A. and M. College that five years later, under his guidance, became "Ohio State." He was a competent, effective administrator who also found time to teach Sunday school, to cope effectively with the politicians, and to conduct a study class in the state prison.

His real field was geology, although he had to resign three times as University president before the Trustees were convinced that he was really more interested in studying rocks than in administering colleges.

Finally, they acquiesced, and he began a happy and profitable 17 years as State Geologist for Ohio; he did much to organize information on its coal and oil deposits. He also helped Columbus, Ohio, with its drinking water problems; carried out a one-man crusade against wasting oil and natural gas; and prepared his son to step into his shoes (probably hob-nailed ones) as State geologist.

Stricken with partial paralysis, in 1891 he wrote the Geological Society of America that he was already only about "half alive" and that he was sending in what probably was his last dues. He guessed wrong. Eight years later, still very much on the job, he found himself president of the American Association for the Advancement of Science.

*Hamilton Alumni Review*

Orton, Inaugural address of Professor Edward Orton

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1874

LD 4245

1874

INAUGURAL ADDRESS

OF

PROFESSOR EDWARD ORTON,

PRESIDENT OF THE OHIO AGRICULTURAL AND MECHANICAL COLLEGE.

DELIVERED IN THE SENATE CHAMBER, COLUMBUS, OHIO, JANUARY 8, 1874.

An institution of learning has its formal opening in Ohio to-day which, unless it grievously disappoints the purposes of its founders and the hopes of its friends, is to be specially connected with the industrial education of the State. It seems, therefore, not only in keeping with the character of these inauguration exercises, but scarcely less than imperative, to briefly discuss on this occasion the subject with which we are thus brought face to face, *Industrial Education, its character and claims.*

The subject of education, as Mill has well remarked, is the most inexhaustible of topics, as fresh to those who come to it with fresh minds to-day as it was to the first explorers of it, and of all many-sided subjects that which has the greatest number of sides.

The educability of man is one of his most distinguishing characteristics. He does not, however, possess a monopoly of this quality in every sense of the word, for certain of the higher groups of animals are capable of being trained and taught; but if not the only educable animal, man is certainly the only educator. In the ripeness of his experience and at the highest tide of his fortune, he teaches to his successors the steps of his own ascent. He bequeaths to his heirs the weapons by which he has won his own conquests over nature. And so it has been from the beginning. As far back as we can follow the history of man, we find him an educator. Without this quality, indeed, he would not be man. The human skull found at Engis, which is counted one of the early relics of the race, is ample enough, according to Huxley, to have held the brains of a philosopher; but whether it belonged to sage or savage, we may be sure that its owner was an educator, one who taught his sons the secrets of the chase and of the shore, the vegetable productions fit for food, the fracture of flint, the virtues of fire, the rites of burial—in other words, the elements of natural history and of physics, and perhaps of metaphysics and theology as well.

These human characteristics, then, of teaching and learning, rooted and grounded as they are in the very constitution of our natures, work out their results in every grade and condition of life. In the lower stages of human society they work blindly and instinctively, and scarcely come within the pale of what we ordinarily style education. But in these later ages of civilization, how wide their scope, how vast their power! What a debt each generation feels itself to owe to those who come after it. How elaborate and how costly the agencies it employs to give to its successors the culture by which the attainments already made can be, if not augmented, at least maintained.

This sense of obligation to make provision for the instruction of our heirs has been wonderfully intensified by the influence of Christianity upon the race. The quickening of conscience which follows its teachings, and especially the loving regard for man as man which it instills, and which is perhaps its most characteristic contribution to the religions of the world, have combined to make the nations that are most deeply imbued with its spirit, lay broad foundations for popular education. And most of all in our own country, where the doctrines of equality and brotherhood taught by Christianity have found for themselves a practical expression in democratic institutions, has the necessity of a comprehensive scheme of education been from the first apparent.

In most of our commonwealths the free school system is now established upon unchallenged foundations. No question is raised as to its necessity or permanence, but many are seriously asking whether, after the public board has been spread at such an outlay, we should not send out the servants of the State into the highways and hedges of society, as in the Gospel feast, to compel those for whom it was designed to come in.

To the better instructed generations that are to come after us, the results that we now attain in the education of our people will seem most inadequate, out of all proportion to the price that we pay; but we attest at least our profound sense of the importance of public education by the munificence with which we provide for it.

As to what this public education should comprise, there is among our people a wide diversity of opinion, and between the different communities of the same State even, an equally wide disparity in practice. We find in Ohio, for instance, that in many of our public schools the work of teaching is intrusted to young men and women who are not only profoundly ignorant of the philosophy and the art of teaching, but who have not so much as heard that there is such a philosophy or such an art. Their teaching is confined to the elements of the elementary branches, and to the crudest and most empirical presentations of these. In other

schools a higher grade of qualifications in the teacher is required, and a much greater measure of continuity and efficiency is secured in the work of instruction. In addition to the elementary branches, the rudiments of American history, of the higher mathematics, and of the natural sciences, begin to find place; and we can thus pass in the public school courses of township, village and city, through an advancing series, the last of which is scarcely inferior in scope, and not at all in thoroughness, to some so-called "college" courses.

In other States again, and conspicuously in Michigan, a university, offering the broadest and most generous culture—with its professional schools of law, medicine and civil engineering—and a normal school which provides professional training for teachers, crown the common school system. Their doors, like the happy gates of gospel grace, stand open to all comers, and we thus find the State dispensing, without money and without price, a liberal, and even a professional education.

This question, then, of how much shall be furnished in our courses of public instruction, is one of grave practical importance, but, as it seems to me, it has been already decided. An argument can be made for limiting the work of instruction at the public expense to the strictly elementary branches. Time was when well nigh universal practice agreed with such a theory, but this scheme has been weighed in the balance and found wanting. It has failed to meet the demands of those for whom it was provided. As our communities have grown richer, the limit has been everywhere overstepped, and the courses of study have been expanded into many times their original proportions. But the question was settled when the limit was passed. It would be impossible to give a good reason for excluding history from the schools after geography had found a place there, and through the same door that natural philosophy could enter, chemistry, botany, and all the sciences would be sure to follow.

It has in this way been decided in all of the more advanced communities of the country, that public instruction should be made liberal in its character. It sees perfectly in keeping with that appreciation of education which has set in order our systems of public instruction, that the superstructure should rise under the same control which laid the foundations—that the State should make provision by which the student, fitted therefor by the six, eight or ten years' course of training in the schools at home, may complete his course in college or university. In other words, to carry on these courses seems legitimate; to stop short at an arbitrarily selected point, suggests the man who began to build but was not able to finish.

A prominent American educator, President Eliot, of Harvard University, has recently exhorted us to hold fast to the "genuine American method" of public instruction. This "genuine American method," which he identifies with "the old Massachusetts method," he further defines as the system which provides universal elementary education at the public expense, but which refuses all State support to the higher grades of instruction. These higher grades of instruction it relegates, in other words, to the zeal of religious sects, to the ambition of villages or towns that have found the more common paths to prominence blocked, to the capricious charity of the world.

There is a good deal in a name, and the name here used, "the genuine American method," is one that is well fitted to win favor in the ears of the American public. It does not, however, necessarily follow that "the genuine American method" is the fullness of all wisdom, and the end of all controversy for every subject to which it is applied. If the claim were a just one that "the genuine American method" and the "old Massachusetts method" were one and the same, there might still be room, outside of Boston at least, for a question as to whether progress were utterly and forever impossible; but I confess to serious doubts as to whether the system above described is "the genuine American method." There is scarcely an interest in the State that rises superior to that of higher education, for it is this upon which, in a great degree, the civilization and worth of a generation depend. Now the system, if system it can be called, that leaves this great interest to the mercy of the agencies already enumerated, and that has done its legitimate work when a score of starved and sickly colleges cumber the ground and render the existence of any vigorous institution well nigh impossible, such a system does not seem to deserve from us any very laudatory title. It is hardly enough in keeping with the practical sense and efficiency of the American people, as shown in every other department of activity, and notably in the work of primary and academic education, to carry with it by any paramount right so good a name as this, the "genuine American method." Compared with it, the system of a State like Michigan, for instance, with its comprehensive and symmetrical system of education, which secures, in addition to all the grades of elementary instruction, the existence of a university that displays the same abundant vitality and vigor in its sphere which the lower schools do in theirs—such a system, I submit, might well put in a counter claim to the title in question. And that this is the general judgment, is seen in the fact that Michigan, rather than Massachusetts, furnishes the model after which the educational systems of all our new States are fashioned.

In harmony with the national appreciation of education, if not in keeping with the genuine American method, or with any method already in use, of establishing or endowing higher institutions of learning, the Congress of the United States, within the last few years, has turned over to the several States a large area of the public domain—an aggregate of 9,600,000 acres—for the promotion of industrial education within their limits.

Whether such a use of the public domain is the wisest that can be made, is a question still under discussion; but it is well to bear in mind in the discussion that this use is not to be contrasted with any ideal distribution of the public land to actual settlers, but rather with the modes of distribution with which we have unfortunately become familiar of late. It seems as if such a view might tend to reconcile those who are disposed to criticize the action of the General Government in endowing institutions of learning. But whether wise or unwise, the measure is now an accomplished fact, and Ohio enters to-day upon the practical use of her portion of the inheritance.

What then is the character of the education to be furnished by the institution which is formally opened to-day? I answer, that its character is in a measure defined by the terms of the congressional grant to which it owes its foundation. I know that it is not always either safe or wise to press to their extreme limits the terms in which legislation is expressed. An eminent English barrister was wont to aver that he could drive a coach and four through any act of Parliament. But it is safe to conclude that in a measure of this magnitude, due consideration was given to the scope and meaning of the terms in which it was expressed.

I. In the first place, the education to be furnished is *Industrial Education*, or, in the words of the organic law, the grant is designed "to promote the education of the industrial classes, in the several pursuits and professions of life." If it is asked who are the industrial classes of American society, I answer, the great mass of the American people. Such is the respect for labor among us, inherited from our Puritan ancestry, that the designation becomes an honorable one, and it seems almost invidious to refuse it to any portion of our population, but I suppose that the learned professions, however industrious and however indispensable to the body politic, would scarcely find a place here. For *their* education, the appliances and endowments that have accumulated in past generations and centuries stand largely pledged. But certainly the term cannot be limited to the classes that live by manual labor. The manufacturer, the builder, the engineer, the farmer, who provide and control the manual labor of scores of hundreds without being able to put their own hands to plow or

plane or spindle, belong, by the best of right, to the industrial classes. It may be counted certain, however, that in these beneficent provisions a kindly eye is cast on those who, by reason of limited means, cannot avail themselves of educational foundations already laid. The providing of the best advantages in the higher departments of instruction at lower rates than elsewhere, and the consequent removal of the great obstacle from the rank and file of society in the way of obtaining an education, we may certainly set down as one of the objects designed. To the mass of the industrial classes of this State, the privileges of Harvard, Yale or Vassar are practically as inaccessible as those of Cambridge or Heidelberg.

The narrow signification sometimes given to this term, industrial education, is expressly repudiated by the authors of the organic law when they declare the aim of the grant to be to prepare the industrial classes "for the several pursuits and professions of life." They give no sanction to the un-American, aristocratic scheme which sets the industrial classes on one side of a line and the cultivated classes on another, and which confronts every man born within the limits of the first division with a "Thus far shalt thou come and no farther;" which does not indeed deny to him all education, but which doles out to him by mete and measure just the kind and amount of training which will make him more efficient as a hewer of wood and a drawer of water—a scheme that has for its avowed object to train the artisan rather than the man.

The education furnished by the congressional grant may be used—if the recipient sees fit—in the way of preparation for the learned professions. The farmer's or mechanic's son is not obliged to sign away his liberty when he enters the doors of this institution. If, when he comes to himself under the genial influences of culture, he finds capacity and aptitude for serving the world best in law, theology or medicine, he is violating no obligation, expressed or implied, by using the discipline and knowledge here attained as an equipment for any one of these professions. Between these callings and others which indisputably belong within the limits of industrial education, there is by no means so wide a gulf as formerly intervened. The civil engineer, the mechanical or the mining engineer, the architect, for any large measure of success in his calling, must secure scarcely less general and special training than the student of law or medicine is obliged to attain—especially under the relaxed demands of recent times in regard to general culture. But the professions of law and medicine, and perhaps some of the others named above, are unmistakably over crowded in our day. Certainly they do not need reinforcements from institutions founded on the new endowments. The old

colleges turn out a numerous swarm each year, that hasten with predetermined steps to the so-called learned professions, while a still larger body of ambitious youths, who are unable to enter by these doors, find some easy way into the fold.

I believe that there is good ground for congratulation on the part of all who love their race, that through all the civilized world to day the rewards of labor, of manual labor, are gradually, or even in some cases, rapidly increasing. The increase of wages in England is working a social revolution there, the influences of which reach to our own markets and farms, and of which the end is not yet. This movement is a part of the process of leveling upward which philosophy, philanthropy and Christianity alike point out as the true path of progress for the race. I do not echo the insane demand of the demagogue, that all species and gradations of mental and physical toil shall be paid for at the same rate; but I do rejoice in the approximation toward equality of pay in so many and so diverse vocations in life. I rejoice when the many gain privilege and opportunity, even at the expense of the luxuries of the few. The movement in progress is certainly diffusing a more healthful tone throughout the body politic, making it easier for those who ought to work in shop or field, to go to work in shop or field. Educated labor, which science is waiting for before it can realize its great ideals, without which capital starves upon its broad acres or amid its gold, is coming to a place scarcely less honorable than either. This College will find a worthy and a congenial field in this great division of modern life.

II. In the second place, the education to be furnished must be *practical*. The word *practical* in this connection has no uncertain sound. A practical education is an education that can be applied to the necessities and demands of every-day life—that can be used in the ordinary work of the world. The branches of a common school education are, for the most part, practical branches. We use the knowledge acquired of reading, writing, spelling, arithmetic, in all our buying, selling and getting gain. Without this knowledge, indeed, we cannot transact the business of life.

Geometry and its subordinate branches, trigonometry, surveying, engineering, are practical studies. We depend upon them in establishing metes and bounds, in the construction of roads and aqueducts. To lose them, would be to relapse into barbarism.

Chemistry has practical applications without number. It teaches the farmer the composition of the soil, the causes of its exhaustion, the laws of its renewal. The manufacture of iron and steel, of glass and soap and paint, are all chemical processes, and for attaining the best results in any

or all of these processes, a knowledge of chemistry is indispensable. Geology has a practical side. We follow by its teachings veins of ore or seams of coal. Even astronomy comes down from its station in the sky to the practical work of guiding commerce to its destined haven. The science of mechanics is a practical science. The architect and engineer must learn and obey its immutable laws before their work can stand approved.

The practical work of breeding and rearing the domestic animals upon which we depend so largely for food, clothing and service, is embraced within the general department of zoology, while to botany belong the laws of the vegetable world, upon which, in the last analysis, every living thing subsists.

I have given examples and not an inventory of branches of science that certainly lie within the limits of a practical education, that certainly constitute a central and all-important part of every educational course that accepts in good faith the congressional endowment.

It must be observed that the law does not, in any of its terms, lend countenance to the view that is sometimes entertained, that the various trades and vocations of industrial life shall be taught on these foundations. It demands institutions in which "the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts," but it is in no wise committed to the incongruous and impracticable work of furnishing at the same time to its students a trade and an education. The young man who has completed any of the courses of study here offered will find his acquisition of a mechanical trade, or that most complex of arts, practical agriculture, facilitated in many and most important ways, by the knowledge and discipline he has acquired. If he does not, he has a right to charge failure upon the system of education adopted. But the College does not undertake to compete with the farms and work-shops of the State on such unequal terms. But the demand that the education furnished here shall be practical, concerns not only the subjects taught, but the modes of teaching them. There are methods of teaching the most practical branches in our entire educational courses in a theoretical, impractical way, divorced as far as possible from all contact with the actual world. The school-boy may learn the table of solid measure so thoroughly that he can repeat it backward as rapidly as forward, and yet be utterly nonplussed if set to measure a load of wood. The college student may learn to demonstrate every proposition of Euclid, and yet be unable to square a corner for the foundation of a shed. He may miss, he does miss, under some systems of instruction, almost every practical application of those sciences which constitute so

notable a part of his curriculum, and which have, by their development, revolutionized the face of the world, and be sent out at the end of his course, with a diploma vouching for his accomplishment in science as well as in letters, without ability to recognize one of the facts about which he has studied, when seen in its natural connections.

The demand that the branches here pursued shall be taught in such a way as to bring out with the utmost distinctness and in the clearest relief their practical applications, is as imperative as that which requires the course to include the sciences that hold these practical applications. A broad realism must underlie the methods of instruction. The student must be brought face to face, as far as possible, with the facts and principles with which he deals. His own eye must see, and not another's.

Nor is it necessary in order to reach such results that new methods of teaching should be invented. The institutions charged with this work have only to put themselves in line with the best teaching of Europe and America. More practical teaching is scarcely possible than Agassiz and Huxley, than Liebig and Chandler have done, or are doing, in their respective fields. Their methods admit of extension to all allied branches.

The colleges founded, then, upon the congressional grant will be false to their charter unless they give to such sciences as I have named prominence and honor; and equally false unless they provide all needful facilities for the effective teaching of these branches, the teaching of them in a truly scientific way—by induction, by experiment—instead of in the dogmatic method which has so largely prevailed hitherto.

But is the practical education to be provided entirely embraced within the limits of such branches as have been already named? Are there not other branches that can be styled practical by as good a right, that show themselves practical by as many tests, and that, therefore, make a just demand for a place in a practical curriculum?

What shall be said of the study of language, especially of our own? Is not the power to make clear, accurate, intelligible statements of what we know or of what we think, a practical power? Does not our education show itself glaringly defective when it leaves us without this ability? Men with knowledge and ideas, but without the power of adequate expression—like lumber-wagons loaded with gold—never pass for what they are worth in the world. But this power to use language with precision and efficiency, and still more the ability to endue it with persuasive force, does not come to us in dreams. There is no royal road, no short cut, to good English. It is one of the choice fruits of education. If obtained at all, it must be bought with a price, the same price that is paid for solid attainments in any other department of knowledge, patient and extended study. Can such study be left out of a practical curriculum?



Again, is not the training that enables us to detect a flaw in a definition, or a fallacy in an argument, as directly practical as the ability to test the strength of iron or the purity of white lead? If we have this power, do we not use it in the daily management of our lives? and if we lack it, do we not suffer from the lack, in person and estate?

Inductive logic has to do with the modes of reasoning employed in many branches of science, with the canons of evidence and the methods of proof, and especially with the proper construction of scientific experiments. In what respect is the power to construe an experiment less practical than the power to make one? Of how much use is an experiment unless its author knows what it proves? Nor let it be supposed that the ability to interpret experiments comes of itself. It not unfrequently happens in the practical world that two contradictory or even diametrically opposite statements are made in regard to some practical subject by practical men, both statements being made in good faith, with equal confidence, and both being established, as is thought, by decisive experiments. But Nature is true, though every man is proved a liar. The error lies in the interpretation of the experiments. Like an unwilling witness, that still is bound by the sanctity of his oath, Nature tells no more than she is obliged to tell. Point blank questions she answers truly, but to ambiguous ones she gives as ambiguous answers as ever the Delphic Oracle gave. How few there are who know how to frame their questions so as to draw out a categorical answer, and how full the world is of these ambiguous replies.

No, the limits of the practical are wider than we sometimes think. "No pent up Utica contracts her powers." All true science is practical in the best sense of the word, for what is science but a knowledge of causes? or, if your philosophy demands the modification, of the order of sequences in nature? With what else, pray, does practice deal? The difference between them is that science finds the true order, marks it, correlates it with other facts, and is able to repeat it under different circumstances, or extend it to new scenes, while practice learns the same true order in an empirical way and for a single field, without understanding its relations or gaining power to transfer it. For every successful process in agriculture or in the mechanical arts there is a reason. True science learns the process and deduces the cause. Practice stops with the process alone, for if it goes farther, it, too, becomes science.

Nor, in our zeal for the practical applications of science, must we forget the deep root from which they spring, for it is the theory of one generation which bears the practical fruit of the next. We marvel, as well we may, at the number and value of the contributions of science to human

welfare which our own age has produced, and we glorify the authors of these practical applications; but let us not forget *their* forerunners and instructors, the men who, without the inspiration of popular applause and without the hope of material reward, maintained the lonely quest of truth—served science for its own sake, and, by their discoveries, made possible the career of the successful inventor. The history of science is full of illustrations.

Take, for instance, the magnetic telegraph. It belongs, beyond contradiction, to the practical world of to-day. By its agency fortunes are made and lost—wars between nations are precipitated or averted. The exchanges of the world are transacted on its wires; commerce waits for its signals before it spreads its white wings upon the sea; the husbandman consults its bulletins before he begins to sow or reap. It renders still humbler service. It summons the fire-engine to the scene of disaster; it gives the alarm when the thief enters our dwelling to steal, or to kill, or to destroy. The practical men of our time are not slow to do honor to its inventor; but before a Morse could do his work a Faraday must have done his. When Faraday was pursuing his patient and searching investigations of the effects produced by the passage of an electric current around a bar of soft iron, a practical man, so called, questioned him as to the *use* which could be made of his discovery. The philosopher could give no good account of his work, and his questioner found in him a new and melancholy example of the waste of high endowments and great capacities of service on the barren and unfruitful problems which mere scientific curiosity could suggest; and yet without just those unpractical experiments the magnetic telegraph would have been impossible.

Perhaps in all England ninety years ago there was no labor that could have justified itself less in the eyes of that practical people than the unpaid toil of William Smith, the founder of stratigraphical geology. He traveled on foot through the United Kingdom, examining every quarry and every exposure of rock along his way, noted the mineral characteristics of each exposure, and, above all, the fossils which the different belts contained. It is easy to imagine the undisguised contempt with which such labors must have been viewed by the practical men of his time, especially when he was utterly unable to connect these labors directly with economical interests. "I am studying an unexplored department of nature," he might have said. "I am arranging, in proper chronological order, the crumpled leaves of the great stone-book, so that henceforth he who runs may read. How my discoveries shall be transmuted into gold, I know not; whether they shall be so transmuted, I care not. It is enough for me to be the first to trace the steps of creative

wisdom, to deduce the grand history of the globe that fills with divine activity and life the ages of an immeasurable past." But when his work was done, and he gave to the world his geological maps and his geological column, he gave with them, or rather in them, the master key that fits all the wards of the subterranean world. We are not slow to give credit to the practical men who use this key in unlocking fountains of living waters for great cities, stores of long-buried heat and light for the service of mankind, or the granite-bound caskets in which gems and gold are hidden; but let us not forget the services of him who with no motive but the love of scientific truth, and no reward but its establishment, with patient but unappreciated toil forged the key.

Modern science, like the vine out of Egypt, has taken deep root and filled the land. It has covered the hills with its shadow. It has sent out its branches to the rivers, and its boughs, which are like goodly cedars, to the sea. Its fruit shakes like Lebanon.

We rejoice, as well we may, in the fair growth of scientific applications; but let us not forget the deep root from which they spring—scientific enthusiasm, the love of the truth for its own sake. Unless this root continue to spread in darkness and seclusion into new fields, and to take in new materials for assimilation and growth, the vine can yield no new fruit, age for the nations. In the best interests of practical utility, then, we must find a place on these foundations for pure science as well as for applied science—for original investigation as well as for successful use—for the patient study of those prolific principles which alone can make our age confer on the age which is to follow it such advantages as it has inherited from its predecessor.

III. In the third place, and finally, the education to be furnished by this institution must, according to the terms of its charter, be a *liberal* education. What is a liberal education? Aristotle first used the term which we thus translate, and by it he attempted to designate an education fit for a freeman. He might have justly included an education that should give freedom to its possessor, that should liberate him from the narrowness, and prejudice, and isolation, the slavery of an uneducated mind. Something at least of this meaning has always been retained, and to-day the conception of a liberal education that would be accepted by the largest number would be found to include the education of man as man, rather than that which equips him for a particular post of duty; the education that concerns itself with the broad substratum of general knowledge, rather than with the special applications of knowledge to some isolated field; the education that aspires to a symmetrical and balanced culture of all human faculties, rather than that which selects one

set of faculties for training and leaves the rest to accident or atrophy; the education that imbues the mind with a generous sympathy for every department of knowledge, and that recognizes the contributions of each department as necessary to the perfect whole, rather than that which transforms its possessors into narrow and conceited specialists, mutually ignorant and intolerant of each other's and of all others' work and claims. Can we, indeed, improve upon Milton's ideal of a liberal education: "I call, therefore, a complete and generous education that which fits a man to perform justly, skillfully and magnanimously all the offices, both private and public, of peace and war."

To serve such purposes a liberal education must always be abreast of its time, must take in the best and amplest knowledge yet attained; and thus we see that it cannot be the same, yesterday, to-day and forever. Some permanent characteristics it does indeed possess, but its actual contents vary for each generation. Its range of teaching widens with the process of the suns. Its scheme requires readjustment from age to age. The true curriculum for one age is not sure to be the best for the next—indeed, we may almost say, is sure not to be the best. Three hundred years ago the liberal education of Europe consisted in what seems to us a fruitless threshing of the barren chaff of the scholastic philosophy and logic. The languages of ancient Greece and Rome, with their splendid literatures, with their models of composition in every department of letters, even yet unrivaled, were reclaimed from the oblivion of a thousand years, and, in spite of conservative opposition, they gained a place for themselves in the scheme of liberal culture. They disciplined and inspired the mind of western Europe in a way unknown before, and their place in the work of education was widened until it covered almost all the field. Literature, and especially the literatures of two great nations that had been dead for more than a millennium, became synonymous with liberal culture.

But in our own day another readjustment, or rather a reconstruction, of the whole scheme of liberal education has been rendered altogether imperative. The last century has witnessed the rise of modern science—most marvelous of the outgrowths of the human mind—with a method and a culture of its own. In the face of undisguised and powerful opposition, it has won its way, by its strong right hand, to universal recognition. It has divided with literature every approved course of study in school, college or university, and has often taken for itself the lion's share. Great foundations, pledged to its exclusive service, are laid on every hand, and the stately halls of the new learning threaten to overshadow the temples of the old. Some of its more ardent disciples, with

an intolerance that can be pardoned but not justified, would rule out altogether literary studies, save in their most elementary forms, from our courses of study. But in regard to the rival claims of literature and science in education, the world is coming to ask with Mill, "Why not both? Can anything deserve the name of a good education which does not include literature and science too? If there were no more to be said than that scientific education teaches us to think, and literary education to express our thoughts, do we not require both? And is not any one a poor, maimed, lop sided fragment of humanity who is deficient in either?"

But further, the advent of science marks and constitutes a new dispensation in the education of the world. Like all new dispensations that can justify themselves, it comes not to destroy, but to fulfill. Its method and its spirit have passed their allotted bounds, but instead of sweeping away as with a flood the earlier culture, they have flowed over it and through it to restore and to renew. They have profoundly modified our study of language, literature, history, politics, philosophy and art. These great branches of human knowledge and thought, in losing their lives as cloudy speculations and disconnected facts, have gained a larger life as sciences. They were never more sure of the future than now. They will hold, too, their old rank in the liberal education that is to be. "I believe," says Prof. Atkinson, of the Massachusetts Institute of Technology, one of the best endowed and most effective of the schools of applied science in the land, "I believe that the old doctrine will still be found to hold true, even after physical science shall have at last found its true place in the new education, that the study of that wonderful world of matter which is the stage on which man plays his earthly part, wonderful as it is, is yet inferior in dignity and importance to the study of the being and doing of the actor who plays his part thereon. Scientific studies, though for the time being in the ascendant, yet, even when all their rights are accorded to them, will, in a well balanced system, take their place a little below ethical studies."

What, then, is a liberal education? I answer with Mill, it is an education that includes science and literature—literature itself being studied by the methods of science. I answer in the words just quoted, it is an education that embraces the study of this world of matter, physical science, and the study of man—his language, his literature, his history, his art, his relations to his fellow men and to his Maker. The day has gone by when a man shall be called liberally educated for knowing a little Latin and less Greek, while as ignorant of modern science, with its profound influence on human thought and action, as a Rip Van Winkle just awakened from the sleep of a century. Such a man's knowledge is not

the best knowledge of his age. He has missed the great ideas that have created anew those who have received them. He is a stranger to the new covenants of promise—an alien from the commonwealth of the modern Israel. There is no liberal education possible to-day, and there can be none in the future, that does not unite the study of these two great elements—man and nature.

One practical art I venture to add to the elements of liberal culture. I should hardly do this upon my own motion, but the unexpected testimony of the venerable Tayler Lewis, Professor of Greek in Union College, and himself one of the most thorough-going defenders of classical training, comes in so happily that I venture to use it. He says:

"There is a reason for including agriculture in this enlargement of the idea of education that cannot well be urged in favor of any other wealth gaining pursuit. The cultivation of the earth has been a universal occupation among all nations, and all classes of all nations. It is not so much a partial employment as a matter of general interest. It is confined to no one rank. The high and the low, the rich and the poor, the learned and the ignorant, are found among the tillers of the soil. More than any of the trades or partial occupations, it is connected with the general morals, the general intelligence, the social and political health. Hence there is reason to regard it as a branch of general knowledge, forming a part of fundamental and general education, not as belonging to a partial course, intended only for those who mean to devote themselves to it for a livelihood, but for all classes, in the same manner as grammar, mathematics and philosophy. Thus regarded, it becomes one of the liberal sciences, a part of the liberal culture."

But you say all this would doubtless be well enough

"If a man could be sure  
That his days would endure  
As of old for a thousand long years."

But what else but mockery is it to lay down courses like this for the industrial classes to pursue? They reclaim, in many instances, but a brief period for education between two lives of toil, and at best they have not as many years to spend as such a course would need decades. This is true. There are but few in any generation that are called to sound the depths and scale the heights of science, literature and art—few that have the inward drawing, fewer still that have the needful scope. But let us not be dismayed. Liberal education is concerned with *quality* rather than with *quantity*. A common school education can be made liberal. It is made so in Illinois by the law requiring the teaching of the elements of history and the natural sciences. The high schools of Ohio furnish a liberal culture. They seek to train the man, and not the artisan. So, too, the courses that are opened here are made liberal by the provision for education in language and in literature, as well as in physi-

cal science. Let us hope that the name will soon come to be better deserved by the establishment of professorships of history, of political science and of ethics.

There is no more beneficent provision in the charter of the College than that which requires the industrial education which it furnishes to be liberal. The liberal education of the industrial classes! Such a phrase would be a contradiction in terms in any other days than the present, and in any other land but our own.

In the quarries near the city, from which the blocks that compose this stately pile were hewn, there is occasionally found a fossil, known in the scientific world by a name of learned length and thundering sound, over which the student of geology bends with a strange fascination. It is the head of a fish of antique fashion, the oldest known vertebrate in the rocks of the continent. It is a witness to the student that when these rocks were forming a new hour had struck on the dial of the world, and the stratum that holds it becomes one of the great boundaries of geological history. If, when centuries have passed, and we, with the noise and strife of our little day, shall seem as far off and as straitened in life and fortune to the nation that shall then possess this continent as the men of five centuries ago seem to us, some thoughtful student of the records of his race shall find in musty and forgotten records this term, "the liberal education of the industrial classes," he will see that it, too, marks an era, and, like the fossil in the rock, would justly divide the new from the old.

The motto that "the cobbler should stick to his last," if taken literally, is a heathen motto, and the pseudo-scientific scheme of education that would teach the cobbler nothing but the science pertaining to sole-leather and waxed-ends is a heathen scheme. The farmer's case is better a hundred fold than that of any other class if he is trained on this plan, for his field is the world of physical science, and cannot be made narrow. But why not make it broader? Why shut him out from the studies that pertain to man? Why not teach him the history of his own race as well as that of thoroughbreds and shorthorns? The golden words of Goethe apply to every living soul: "Nothing, after health and virtue, gives us so much pleasure as learning and knowing."

The Ohio Agricultural and Mechanical College has been organized in good faith upon these provisions. Its endowment and its equipment make it possible for it to render signal service to the education of the State, and such service it is eager to render. It rejoices in the paradox of Scripture that "to whomsoever hath shall be given," and waits with patience and confidence to find this proved true in its own experience.

It invokes the good will and support of the State, and especially does it make its appeal to the great agricultural interest of Ohio — an interest which is admonished by a failing soil, by shrinking harvests, by swarms of destructive insects, not less than by insatiable middlemen and the gigantic corporations which overshadow us all — of the urgent necessity that is upon it of making friends with science — the science of nature and the science of man.

With the answer to a single question that is sometimes heard, I will close. The farmer asks whether his son, if sent to college, will ever come back to the farm again. I submit that this depends very much upon the style of the farmer's daily walk and conversation while his son has been under his tutelage. Some young men reared upon farms are so disgusted with the ill-remunerated and unrelieved toil and the sordid ways of living that they have found there, that "the sweet fields beyond the swelling flood" would fail to tempt them if these fields were to depend upon them for tillage. It shall be our task to make this most ancient and honorable of human arts more attractive and more remunerative by the teachings of science, and to show, in the light of political economy, its paramount importance in the social fabric.

Edward Orton<sup>1</sup><sub>SR</sub> (1829-1899)

Edward Orton, college professor and administrator, geologist and public official, saw the urgency a century ago for the conservation of natural resources.

Born March 8, 1829 in Deposit, N.Y., Orton graduated from Hamilton College, Clinton, N.Y., at the age of 17 and studied at Harvard University's Scientific School.

He also attended two seminaries: Lane Theological Seminary, Cincinnati, in 1849, where he was forced to withdraw due to failing eyesight, and later, Andover (N.Y.) Seminary.

From 1856-59 he held the chair of natural sciences at the State Normal School at Albany, N.Y., and for the next six years was principal of Chester (N.Y.) Academy.

He joined the faculty of Antioch College as professor of natural history in 1865 and became president in 1872, serving for one year.

In 1873 he accepted the first presidency of the new Ohio Agricultural and Mechanical College in Columbus, which later became Ohio State University, and also a geology professorship.

After eight years he resigned as president but retained his position of professor of geology, until his death Oct. 16, 1899.

His service with the newly-formed Ohio Geological Survey began with his appointment in 1869 as an assistant to Prof. John S. Newberry. He succeeded Newberry as director in 1882 and held the position for life.

In 1855 he married Mary M. Jennings, his first wife, who died in 1873. He later married Anna Davenport Torrey.

(more)

Orton was nationally recognized in his profession and served a term as president of the Geological Society of America. In 1899 he was elected president of the American Association for the Advancement of Science.

He served on the Committee on Health and Sanitary Affairs of the Columbus Board of Trade from 1885-91, and contributed a number of reports on water supply.

According to Ohio State's third president, Dr. William H. Scott, Orton was regarded as an inspiring teacher, noted for his clear expression of ideas.

Scott, in a sketch of Orton, <sup>2</sup> also wrote that the university's first president campaigned vigorously for the conservation of "the stored power of the world."

"He pointed out," Scott wrote, "that the supply of coal, of oil and of natural gas is in the nature of the case limited and must some day be exhausted."

According to Scott, Orton declared that "waste is immorality," and he admonished coal field operators against wasting fuel and sought legislation which would compel use of more economical mining methods.

Another target of Orton's attacks was the operators of newly-discovered gas wells in Northwestern Ohio, who allowed their wells to burn off the gas continuously.

Orton protested the practice of luring new industries to the area with the promise of free gas because it encouraged waste.

(more)

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In the preface to Vol. VII of the Ohio Geological Survey Reports, Orton noted that his warnings were disregarded and even resented.

Subsequently his warnings were borne out, Scott said, when many of the glass factories brought to the area with the promise of free gas were abandoned, and those that remained were forced to supplement their fuel supply with coal, wood and oil.

-rb-

1. From: "History of the Ohio State University," Vol. 1, 1870-1910.
2. Papers of William H. Scott, third president of Ohio State University, University Archives.

PROFESSOR EDWARD ORTON.\*

1829 — 1899.

A MEMORIAL ADDRESS.

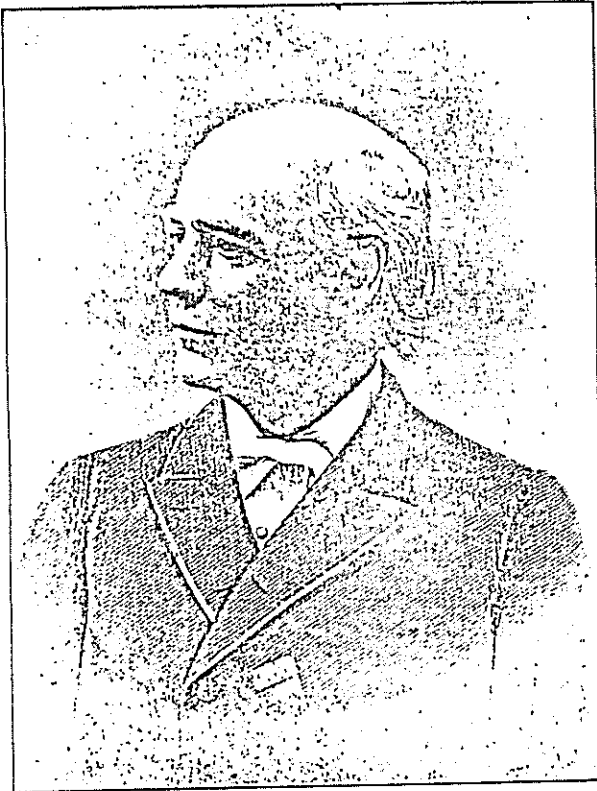
BY WASHINGTON GLADDEN.

The genealogical history of "The Orton Family in America," a book of which Dr. Edward Orton was the author, begins with this paragraph:

"The surname ORTON is neither a common nor an unusual one. It is a name that could be heard without surprise in any community of English descent. It occurs in the directories of many cities of the country and can probably be found in many towns of the United States that have a population of 100,000 or more; but the list of Ortons is generally confined to a few individuals, and in many cases there is but a single family."

The name is found in Denmark, and Norway: there is at least one Norwegian family in Minnesota who brought the name from the Scandinavian peninsula. But it is more common in England; several localities in Leicestershire bear the name of the family; and since the larger number of the earliest settlers of New England came from the central and eastern portions of Old England it is fair to assume that Thomas Orton who settled in Windsor, Conn. between 1636 and 1641, belonged to the

Edward Orton became a life member of the Ohio State Archaeological and Historical Society soon after its organization. He gave it much of his valuable time and took a deep and unremitting interest in its work and progress. He delivered many addresses at its meetings, and added much to its published literature. The officers and trustees of the Society freely counseled with him concerning the work entrusted to them. The secretary was often greatly indebted to Dr. Orton for suggestion and encouragement. A few weeks previous to his death Dr. Orton was elected a trustee of the Society, a position which had been many times offered him before. While characteristically disclaiming great learning in archaeology, Dr. Orton nevertheless was regarded as a scholar of high authority in that subject. — E. O. R.



PROFESSOR EDWARD ORTON.



but the young theologian was less afraid of heresy than of heathenism in theology, and he made his way thither, pausing however by the way, for what reason I know not, to study chemistry for six months in Harvard, under Professor Horsford. At Andover he completed his theological studies. Edward A. Park and Austin Phelps were the brightest stars in the Andover constellation at that time; their theological method was somewhat more modern than that of Lane; they sought a rational view of Christian doctrine, and Edward Orton was able under their guidance to hold on to his purpose of preaching the gospel. Soon after leaving Andover he was ordained to the ministry of the Presbyterian church, and accepted the pastorate of a church in the secluded village of Downsville, in Delaware County, New York. Of this ministry we have but slender records. Dr. Orton was reticent about this experience. It would be perfectly safe to say that he was an earnest preacher and a faithful pastor; that his deep sincerity and his strong human sympathy must have given him great power in the work of winning men. Nevertheless it was a period of storm and stress; his theological difficulties deepened; many of the things which he was expected to teach came to bear for him an air of unreality; at length, after a struggle whose nature we can guess,— and can only guess, because he has not chosen to share with his friends his mental disquietude — we find him turning from a task that had become to him impossible, and entering, in 1856, upon his life work as a teacher in the State Normal School at Albany.

He had given up the ministry, but he had by no means parted with his religious purpose; he connected himself with the First Presbyterian church of Albany and taught a large Bible class in the Normal School. After a while it began to be noised abroad that the teachings of this Bible class were not following the beaten track. What was the nature of the divergence charged against him I do not know; it may, very likely, have been some conflict between his science and the traditional interpretation of the Book of Genesis. This was a time when strenuous efforts were made to reconcile Genesis with geology; such books as Hugh Muller's "Testimony of the Rocks" and Pye Smith's "Scripture and Geology" held fast to the historical and scientific accuracy of

the early chapters of Genesis and sought to make them agree with the facts of modern science. Of course it was a hopeless undertaking; those chapters do not tally with the testimony of the rocks and it is not improbable that Edward Orton said so. It would be hard to find a professor in any Congregational Theological Seminary in the world to-day who would not say the same thing; but in those days such a statement was flat heresy, and Professor Orton found himself under a cloud. He had been assisting, with great acceptance to the pupils, in conducting morning worship in the chapel of the Normal School; he found that his assistance in this service was no longer requested, and on inquiring of the authorities the reason of this change, learned that they did not deem him a fit person to lead the devotions of the school. At once he resigned his position, and his resignation was accepted. Some account of this transaction is found in a correspondence which appeared in the New York Tribune of June, 1859. A letter signed "Jefferson," was printed in that paper, June 17, which states that some three or four years before a young Presbyterian clergyman had been appointed professor in the State Normal School at Albany; that he had fine talents for teaching and because of his religious character had been appointed to take charge of a Bible class of pupils; that he had been removed from the charge of this class on account of his religious opinions, because he no longer believed in all the doctrines held in the church to which he belonged; that Presbyterian clergymen in town were aware of his changed views, and that the principal of the school, probably moved by them, had, though with much reluctance, made the heresy of the professor an objection to his continuance in the school. "It was not alleged," says the writer, "that he obtruded his religious opinions upon the scholars, or in any way sought to make proselytes; neither was it objected that his character as a truly religious man and a faithful teacher, was in the least degree impaired. On the contrary he was, if possible, more than ever beloved and confided in by his pupils and was acknowledged by all to be the most popular teacher in the school." But outside influence had undoubtedly demanded his separation from the institution. The

"I have only to add that were it left for me alone to choose, even the interest which I cherish in the principles involved in this matter would be hardly sufficient to overcome the reluctance which I feel to achieving such kind of notoriety."

It seems, at this day, almost incredible that such a man should have been compelled for such a reason to give up a good work in a state institution which he was undoubtedly performing with the greatest skill and success, but that was a day when the heresy accuser was abroad in the land and he was a mighty man of war, armed with bows and arrows and slings and sharp spears. There was little mercy for those who aroused his suspicion.

From Albany he was called to the principalship of Chester Academy, in Orange county, New York, where he wrought for six years, with all good fidelity and to such purpose that his name became widely known, so that in 1865 he was called to a professorship in the college which Horace Mann had made famous by his consecrated labors, and from whose presidency Thomas Hill had recently retired. Antioch College was in those days one of the most promising of the western institutions, and the call was a distinct promotion for Mr. Orton. But it was, at this time, under Unitarian control, and the acceptance of a professorship in it signified the identification of the professor with that denomination. To his good Presbyterian father, who had then retired from the ministry and was dwelling in retirement in northern Pennsylvania, this was a terrible calamity—almost a tragedy. He could not regard his son's action in any other light than that of apostasy; for a long time he could neither be reconciled nor comforted. At length, however, he was persuaded to visit Yellow Springs, and after a few weeks spent in the home of his son, the father returned to his own house greatly reassured and quieted. One cannot help pitying the good man in his agony of soul over the departure of his son from the orthodox fold, yet one must wonder at the blinding power of a theological prejudice, which could fill the heart of a father with mortal fear for the fate of a son with a faith as firm and a character as Christlike as that of Edward Orton.

Of the work of Dr. Orton at Antioch I can give no adequate report. I meet men and women, now and then, who were his pupils there, and I have never met one who did not speak of him with filial affection. Doubtless it was a good service that he rendered there, as everywhere. On the resignation of Dr. Hosmer in 1872 he was made president of Antioch; a year later he was called to the presidency of the new "Ohio Agricultural and Mechanical College," now the Ohio State University.

The remainder of his life—more than a quarter of a century—has been spent among us; it has been an open book, known and read of all men. For eight years he held the presidency of the College, which in 1878, became the University; since 1881 he has been professor of Geology. In 1869 he was made one of the assistants of Professor Newbery, the state geologist; since 1882 he has held the honorable position vacated by the latter, and seven thick volumes of geological reports will forever connect his name with the physical history of the State of Ohio. The statistical, geographical and scientific portions of the article "Ohio" in the Encyclopedia Britannica are also from his pen.

Such is an imperfect outline of this busy life. The difficult and delicate task remains to me of offering some estimate and appreciation of the significance and value of this life.

1. Of the scientific work of Dr. Orton I am not, of course, qualified to speak. I only know that he was held in high esteem by his contemporaries and associates in scientific study; his selection last year to the presidency of the American Association for the Advancement of Science is evidence enough of that fact. It was to him a most gratifying recognition of his honorable career, and I am sure that there was not one of his neighbors in Columbus whose heart was not warm with thankfulness and pride when this honor was bestowed on him. It was a fitting and beautiful thing that his life should be crowned, at the end of his days, and in the presence of those who loved him best, with this high distinction.

All I can say about his scientific attainments is that he knew how to make the subjects of which he treated profoundly interesting. The lucidity of his exposition, the quiet eloquence of his presentation clothed all these themes with light. And his words,

EDWARD ORTON, SR.

Edward Orton, Sr., first president of the Ohio A. & M. College, later The Ohio State University, was trained for the ministry but in time he turned to science and spent the better part of his life in that field. He held a number of school posts before he reached the level of college work and lost at least one such position because of alleged heretical views. Actually, he switched from Presbyterianism to the Unitarian faith where he was more comfortable.

He was born March 9, 1829 at Deposit in down state New York, the son of a Presbyterian minister, and the nephew of another. The young Orton worked on neighborhood farms but his father gave him most of his early education. He entered Hamilton College as a sophomore and was graduated there in 1848. A year later after teaching in an academy at Erie, Pennsylvania, he entered Lane Theological Seminary where, like his father, he was taught by Dr. Lyman Beecher. After a year there he withdrew and before long turned to science and studied at Harvard. Next he spent a year at Andover Theological Seminary. Then followed five years of teaching at a New York academy. Next he became professor of natural science in a state normal school at Albany, followed by six years as principal of Chester, New York, Academy. Then came a call to Ohio where he spent remainder of his life. First, he was principal of the preparatory department of Antioch College. Next, he held the chair of natural history there and in 1872 became Antioch's president.

Orton was one of the first five men elected to the Ohio A. & M. faculty at the January 1, 1873 Trustees' meeting. The evidence seems to be that he first declined the offer but accepted later when the presidency was added to the chair of geology, mining and metallurgy. There is no record of this in the Board

EO, SR.

minutes and the Trustees, strangely, met officially only once, - April 9, - in all of 1873 after the January meeting. Even on the April 9 occasion a motion to proceed with the election of a president was withdrawn.

The official faculty minutes shed no light on this, either, but those for its first meeting, Wednesday, September 17, 1873 "at about 2 o'clock P.M.," show the president and the other six faculty members present. Joseph Sullivant, of the Trustees' executive committee, was "present as a visitor." A provisional schedule of classes was drawn up and the faculty urged a course of lectures on history and political economy to be given by the president, along with one on agriculture by Dr. <sup>Norton</sup> ~~Townshend~~ (q.v.). Orton and the secretary, 21-year-old John H. Wright, signed the minutes. Orton signed his name "Edward Orton, Prest."

He was formally inaugurated in a ceremony January 8, 1874 in the Senate chamber at the Statehouse in the presence of the governor and other state officials and of "a large and intelligent audience." He spoke on "Industrial Education, Its Character and Claims." He emphasized that the education to be given "is Industrial Education," and that it "must be practical." He called good English "one of the choice fruits of education," said that modern science had "taken deep root and filled the land," and declared that the education to be given by the infant college must, by its charter, "be a liberal education."

Orton's eight years in the presidency were not smooth. He had to try to do much with little support. The college was still out in the "country," its resources were very limited, and it grew slowly although it made progress in the face of difficulties. In 1878 Orton offered his resignation as president,

EO, SR.

proposing to stay on as professor of geology and as state geologist to which post he had been appointed. Other contributing factors may have been the dropping of algebra as a requirement, a faculty pay cut, and the Trustee requirement of daily chapel exercises. The Trustees finally acceded to his request in June, 1881.

Orton continued with his teaching and with his labors on a monumental work on geology. He was married twice, and had two sons, Edward Jr. and Samuel T., and two daughters, Clara G., and Louise (Mrs. F. C. Caldwell). Orton served as president of the American Association for the Advancement of Science and died about the time of its national meeting on the campus in the fall of 1899. In 1891 he had the unusual honor of having the new geology building named for him while he was still living and in 1881 the <sup>University</sup> conferred an LL.D. upon him for his services.

Both the Trustees and the faculty adopted lengthy memorial resolutions upon his death. The former, while calling him "a timid man," said that as first president of the University, "he had a greater responsibility in planning and shaping its destiny than any other man." The other observed that for all his accomplishments, "it was as a man that he most deeply impressed us, and it was as a man that he rendered his largest service to mankind."

MAY 18 1963

COLUMBUS CITIZEN-JOURNAL

## Memorial To Honor Dr. Orton

A memorial to the first president of Ohio State University, Dr. Edward Orton, will be presented to First Unitarian Church Sunday during the 10:30 a.m. service.

Mrs. Louise Orton Caldwell, daughter of the late Dr. Orton, will present a shelf of books from her father's library to the church.

The Rev. John Evans, former minister of the church, now in Plainfield, N.J., will be present to accept the gift on behalf of the local congregation. Dr. Morton H. Frank, assisting professor of the psychology department at OSU will talk about Dr. Orton, his life and times.

A memorial plaque, prepared by Chester Nicodemus, will be installed in the Orton Memorial Library.



UNITED STATES BOARD ON GEOGRAPHIC NAMES

*In reply please use this address:*  
523 NATIONAL CENTER  
RESTON, VIRGINIA 22092

August 16, 1979

Mr. R. T. Boehm  
2701 Berwyn Road  
Columbus, Ohio 43221

Dear Mr. Boehm:

This is in reply to your July 16 letter requesting the origin of the name Mount Orton in Rocky Mountain National Park, Colorado.

The name, Mount Orton, was proposed to the Board on Geographic Names by William Cooper in September 1911, and was approved by the Board in November the same year. We have enclosed copies of pages from the book High Country Names by Louisa W. Arps and Elinor E. Kinery which tells about the mountain and its name.

Sincerely yours,

A handwritten signature in cursive script, which appears to read "Donald J. Orth".

Donald J. Orth  
Executive Secretary  
Domestic Geographic Names

Enclosure

mill was just about completed, the tramway finished, and both day and night shifts worked the main lead of the Clara Belle. It had no more success than the Olive operation, and folded about the same time.

**Olympus, Mt. 8808'**— (East of Estes Park village)

The 1914 Arapahos called this mountain and two adjacent hills by words which translate as Faces to the Wind.

By naming Mt. Olympus, Fernando C. Willett is given credit for bringing Greek mythology to the Park area. Willett was a school teacher who had served with great success as the principal of the high school in Evansville, Indiana, from 1866 to the spring of 1870. He resigned because of ill health. After staying in Denver, he came to Estes Park in May 1873, where he tutored the Griff Evans' children and lived with his cousins, Mr. and Mrs. John Hubbell, in a two-story house over a mile from Evans' cabins. In Estes Park that summer of 1873 were other educated people—two geological survey parties whose leaders were Ivy League graduates, titled British sportsmen, Miss Anna Dickinson of the lecture circuit, Miss Isabella Bird, world traveler, and Rocky Mountain Jim Nugent. Surely Fernando Willett's classical allusion to Mt. Olympus, the home of the gods, was not only applauded but comprehended.

Both John Hubbell and Fernando Willett had hoped to find health in the mountains. Mr. Hubbell's seven months' stay did him no good; he died the following January. Willett recovered sufficiently to become secretary of the American legation in Mexico City, where he died somewhat later.

**Onahu Creek** (First and last syllables accented) GRAND LAKE

The 1914 Arapahos used this name for Fish Creek, a tributary of the North Fork of the Colorado River. It means "warms himself," and refers to one of the Indian race horses who on cold evenings came up to the fire to warm himself. This horse died on Fish Creek, whose undistinctive name the Colorado Geographic Board changed to Onahu.

**Opposition Creek** NEVER SUMMER

Some old-timers think the 1961 map misplaced this creek. They claim that Opposition Creek runs in what is called Red Gulch on the 1961 map. Others say the map correctly places it in Hells Hip Pocket, and the reason the Grand Ditch ended here for so many years is that an especially obdurate boulder opposed its strength to that of the ditchdiggers, stopping the ditch and naming the creek.

 **Orton, Mt. 11,724'** WILD BASIN

Professor Edward Orton, Jr. of the Chemistry Department of Ohio State University, conducted a survey of Mills Moraine and the Longs Peak area one summer in the early 1900's. Dean Babcock, a summer resident, who joined Orton's Ohio students, remembers that they wanted to name a peak in honor of their leader. Professor Orton declined the honor, but offered his father, Edward Orton, Sr., as a worthy candidate. Orton, Sr. was president, first of Antioch College, then of Ohio State University (1873-1881) and was state geologist for 20 years. Babcock saw to it that Mt. Orton appeared on the Cooper-Babcock map of 1911. The younger Orton commissioned Dean Babcock to paint a portrait of the mountain and presented the painting to Ohio State University as a memorial to his father.



# LOOKING BACK

## Orton Hall—a history written in stone

By Bob Boyce and Patricia Mroczek

Legend is built on beauty and mystery and one Ohio State building qualifies with both—Orton Hall.

The 1893 building features fantastic gargoyles and winged animals cut from stone.

Orton Hall is the home of the Department of Geology and Mineralogy.

Appropriately, it reflects Ohio's own geological history. Orton Hall is constructed of 40 kinds of native Ohio stone, and these varieties of stone are laid in the same sequence as they are found in Ohio bedrock.

The building honors Edward Orton, the University's first president and a noted geologist whose life was filled with challenge and diversity.

Some thought he was a man before his time.

Others knew him as a man devoted to scientific endeavor.

As the founding president of the University, Orton's impact on Ohio State is virtually written in stone. He served as president from 1873-1881 after two other candidates declined the post.

Orton, too, had initially declined the presidency but agreed to leave Ohio's Antioch College when the chairmanship of geology, mining, and metallurgy was also offered to him. Orton was one of the seven original faculty



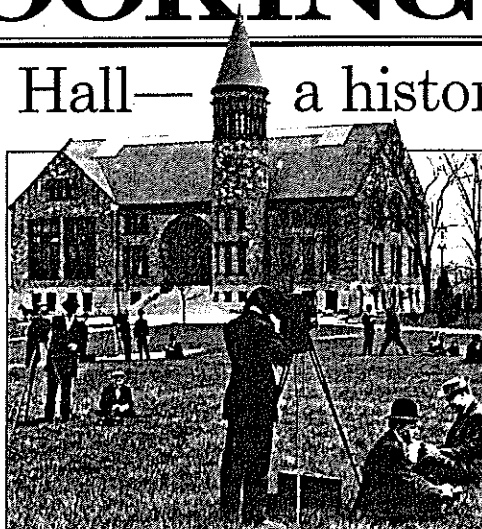
Ohio State's first president, Edward Orton, created a rock-solid foundation for University growth.

members when Ohio State opened its doors on September 17, 1873, and he knew running the new Ohio Agricultural and Mechanical College would be a difficult task.

Financial resources were slim, higher education theory was being discussed and argued passionately, and public attitudes were unsympathetic.

A great debate arose. Ohio intellectuals argued over whether the new college should offer strictly agriculture and trade courses or a broader liberal arts education.

Orton had made his opinions known early. During his inauguration, he announced that students would receive "a practical



Whether in 1908 or today, the tower of Orton Hall is among the most photographed landmarks on campus. (Photograph appears in *The First Hundred Years: A Family Album of the Ohio State University, 1870-1970*. Copyright © 1970 by the Ohio State University Press. All rights reserved.)

education that must, by its character, (also) be a liberal education."

Many didn't like that idea. So Orton's eight years in office didn't pass smoothly. It wasn't the first time his liberalism had gotten him into trouble.

A minister by training, Orton lost his pastorate in New York after his liberal views became too much for his congregation to handle. He left the ministry to teach and spent the rest of his life dedicated to science.

At Ohio State, he helped the college grow from the original building—University Hall with 17 students—into an academy with more than 235 students by the early 1880s.

Much of that growth came without the help of state government, which had launched its new college and then gave only meager and intermittent support.

With the college finally underway, Orton offered his resignation three times to the Board of Trustees before they would accept it. Records indicate their disbelief that Orton wanted out of the presidency merely to study geology.

But in 1881, the board accepted his resignation as president, and he remained on faculty another 18 years pursuing his research interests. In 1882, he became the state geologist.

In 1891, the board decided to honor him by naming the University's new geology building after him. Orton had helped design the structure during the decade following his presidency, and the structure formally opened in 1893.

Orton died six years later. Today, his building still remains dedicated to geology. It is the second oldest classroom building on campus and is listed on the National Register of Historic Places.

The building's lower level is built of Dayton limestone and Springfield dolomite with Berea sandstone in the main and second floors. Red sandstone trims the windows.

logical Museum, classrooms, labs, and offices for the faculty and staff of the geology and mineralogy department.

One of the building's most elegant features is famous Orton Library. Planned and furnished by Orton's son, Edward Orton, Jr., the library still retains its 19th century ambience. The geologist's son created the country's first industrial ceramics program at Ohio State and founded the American Ceramic Society.

Another well-known feature of the building is Orton Geological Museum. At one time it displayed the huge Conway mastodon, which, for many years, was a favorite tourist attraction for Ohio school children who visited the museum.

The mastodon was moved to

Rising high above the Oval, the tower houses one of Ohio State's most beloved treasures—12 Westminster bells that have pealed each quarter-hour for almost 70 years.

The chimes are operated by music students who offer selections at noon and 5 p.m. daily during the academic year. The 12 bells cost \$7,432 and were the gift of classes '06 through '11, '13 and '14.

The bells weigh from 550 to 2,800 pounds apiece, and the tower's stone walls are two feet thick to support their massive weight.

Prominently displayed on the top of Orton tower are two dozen red sandstone gargoyles.

The gargoyles are said to represent the animal life of past

The grand entrance hall, which has welcomed students for almost a century, features nearly every type of native building stone. Shaped and carved features in the entryway are of sandstone; panelling and wainscoting are made of limestone.

Some of the hall's most notable features are the many columns lining either wall of the entrance, each identified and labeled. Lintels and capitals of the columns are of Berea sandstone, ceiling ribs of Danville red sandstone with spans of Tippecanoe buff sandstone and insets of Clinton limestone.

At one time, the building housed the University Library and, for a brief period, the Law Library.

It also once was home to the Department of Ceramics, the main office of the Ohio Geological Survey, and a U.S. Geological Survey Coal Geology Laboratory.

Today, it contains the Orton Geological Library, Orton Geo-



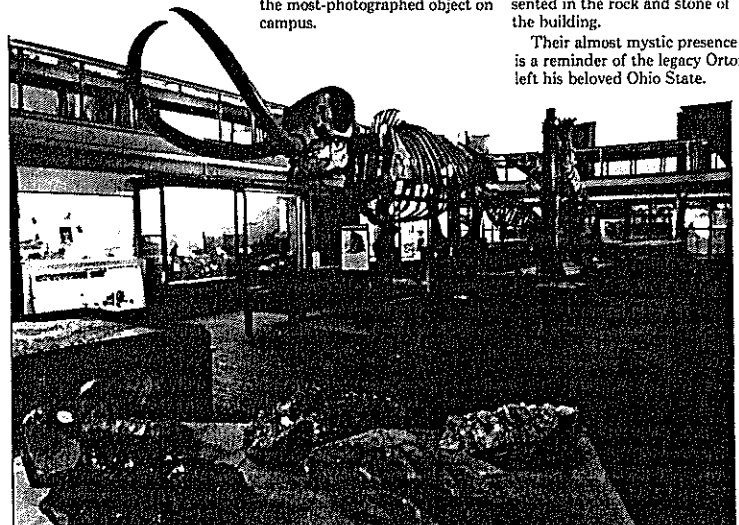
Orton Library, planned and furnished by Edward Orton, Jr., retains the ambience of the 19th century.

the Ohio Historical Center in 1970, marking the museum's shift in emphasis from public display to research and teaching.

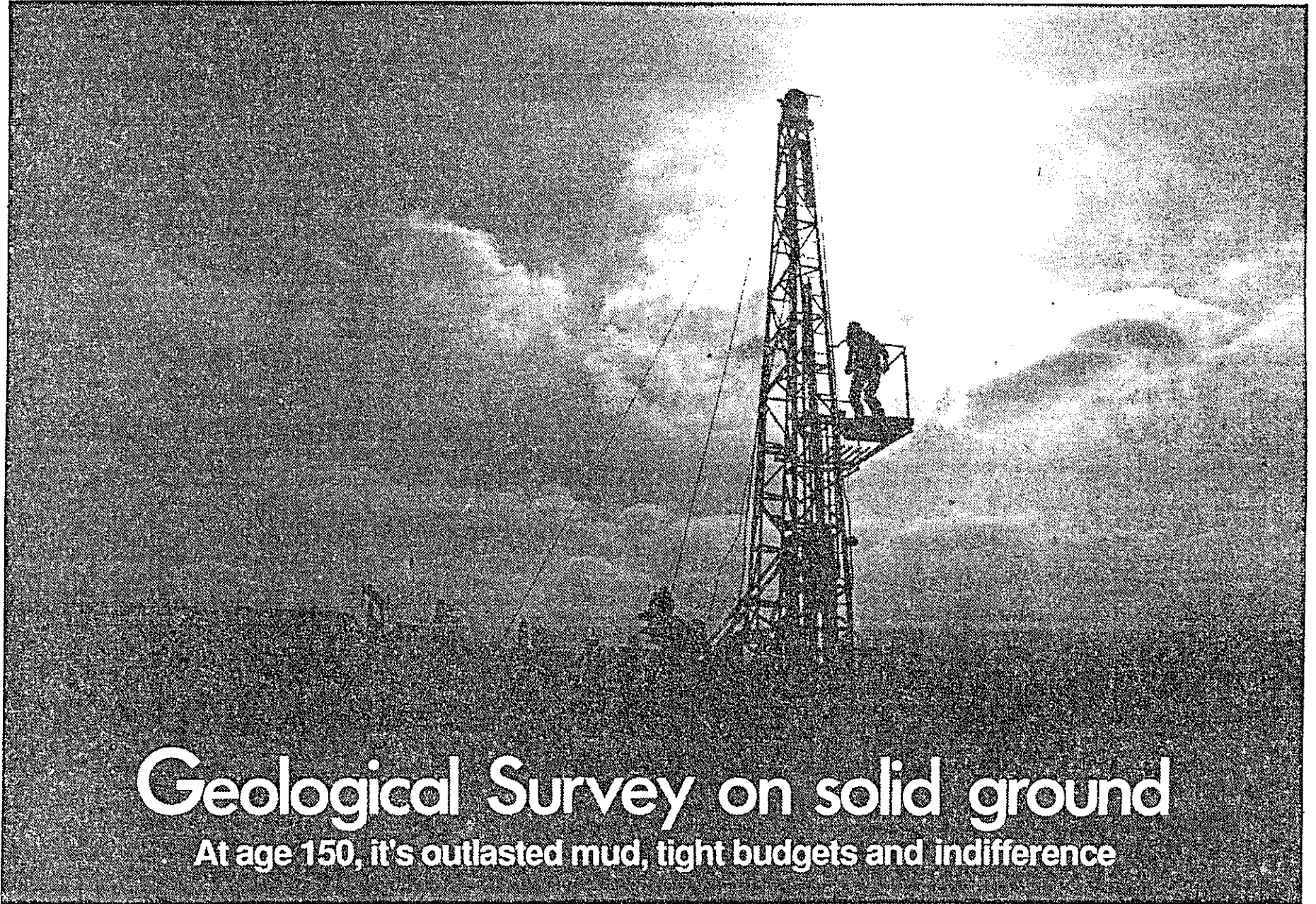
Orton's most famous feature, however, is Orton tower, a three-story stone turret that may be the most-photographed object on campus.

geological ages. Ancient reptiles and dinosaurs, like the marine reptile ichthyosaur, the flying pterosaur, and the rhinoceros-like titanotheres were selected because they coincide with the various geological ages represented in the rock and stone of the building.

Their almost mystic presence is a reminder of the legacy Orton left his beloved Ohio State.



A huge mastodon was a favorite attraction in the Orton Geological Museum for many years. It was moved to the Ohio Historical Center in 1970.



## Geological Survey on solid ground

At age 150, it's outlasted mud, tight budgets and indifference

ORTON, EDWARD, SR.

Dispatch photo by Jeff Hickey

The survey's task today includes taking core samples for Ohio's Superconducting Super Collider proposal

## **SURVEY** continued from 1 F

huge underground federal atom-smasher, which it hopes to build across a four-county loop north of Delaware.

With the state facing an August deadline on its Superconducting Super Collider proposal, the survey has begun a crash program to complete 16 core holes around the ring to provide the necessary geologic data on construction conditions.

The survey has not been active in education, although Collins would like to change that. It makes no sense, he said, that many Ohio high school students study biology and life sciences but never learn about the earth they walk on.

*Ohio Geology*, edited by Hansen, enjoys a wide high school and college readership because of its non-technical prose on earth topics. This June, the survey will also hold its first geology and minerals workshop, a week-long credit course for teachers and other interested people.

**THERE IS** a misconception, said Collins, that Ohio geology is boring because — unlike the West — there's not as much to see. In Ohio, most of the rock outcroppings have been ground down out of sight by the advance of glaciers and cities and the relentless attack of plow and shovel, wind and rain.

But to a geologist, that's what makes it interesting, Collins said. An Ohio geologist has to be more

of a detective, seeing more than meets the eye.

"Out West, you can follow an outcrop for miles. But here in Ohio, you can walk for miles and only see the outcrop two or three times," he said. "It's very difficult to do eastern geology. The West is beautiful, but certainly it's not as challenging as working in this part of the country."

After 150 years, survey geologists have a pretty good idea of the state's surface and near-surface formations, although they're still puzzled by the mechanics of shore erosion along Lake Erie, said Collins.

**THE CHALLENGE** now, he said, is to use new earth-probing technologies to learn more about the nature of the so-called basement rock thousands of feet beneath the covering blankets of sedimentary formations.

These ancient granite and lava formations, formed in the Precambrian period some 800 million to 1.5 billion years ago, hold the key to earthquake patterns, future oil and gas deposits, and — just possibly — deep reserves of precious metals. The tops of those base formations begin at depths of about 3,000 feet in western Ohio, slicing down to 13,000 feet in eastern Ohio.

"There are some mysteries left," said Collins. "We certainly don't know everything we need to know."

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*David Lore is The Dispatch's science reporter.*

By David Lore,

**T**his Friday is the 150th anniversary of the Ohio Geological Survey — no small achievement, since this year also marks the 148th, 113th and 94th anniversaries of the survey's demise.

The survey is one of the state's oldest institutions, but its budgetary base has always been more quirky than granite.

Established in 1837, the survey was disbanded two years later and not reinstated until 1869. Over the next 30 years, the survey was out of money a good portion of the time, losing its appropriation between 1874 and 1889 and again between 1893 and 1900. In modern times, only an unusual alliance between railroaders and campus geologists kept the survey from being shut down again in 1931 on the eve of the Great Depression.

"WE ARE an agency that tends to get overlooked," said Horace R. "Buzz" Collins, state geologist and chief of the Ohio Division of Geological Survey. "And when you have to cut a budget, one of the first things you cut is science because you have to keep things like the prisons and the hospitals going."

Even today, although the survey is an integral part of the Ohio Department of Natural Resources, with 60 employees and a \$2.7 million budget, it doesn't have the trappings of a real bureaucracy. The survey is a research, educational and fact-finding outfit that doesn't issue rules, collect fees or even regulate anybody. It's an incongruous place where geologists work against deadline to explain the slow process of crustal creep and sway over billions of years.

"I still run into people who say, 'When is the survey going to be over?'" said Collins.

OHIO LEGISLATORS had the same question when the survey was established on March 27, 1837.

The initial legislation provided for a state geologist and five assistants who would survey Ohio's underpinnings and mineral resources and report their findings to the General Assembly.

The job was seen as a finite one, to be completed within two years. The geologists were provided with neither offices nor laboratories nor a staff. Indeed, the survey didn't get a permanent headquarters until 1900 or a full-time chief until 1928.

The survey was created in part to squelch speculation and fraud in the sale of frontier silver and gold claims, Collins said.

Ohio's first state geologist, William W. Mather, spent \$16,700 and produced a wealth of data, if not of precious metals. Geologists reported on the salt industry — the leading minerals industry of the day — as well as on Lake Erie shore erosion and the extent of coal, limestone, clay, sandstone and iron ore deposits.

They also established the basic stratigraphic sequence of limestone, shale and sandstone formations underlying Ohio and even reported from their travels on many varieties of wildlife now extinct within the state.

Once the initial survey was completed, though, Mather and his staff found themselves out of a job. Appropriations were denied after 1838 and not resumed until 1879.

According to an agency history compiled by Collins and staff geologist Michael C. Hansen, the results of that first survey disappointed many legislators who had expected more dramatic findings.

While seeking to discourage speculation, the lawmakers themselves had

inflated expectations of the land's riches. Strapped for cash because of the financial panic of 1837 and Ohio's ambitious canal-building program, the legislature had little enthusiasm for subsidizing science without the prospect of treasure.

TODAY, THOUGH, we should appreciate the achievements of this small band of geologists, says Collins.

The quality of their work was remarkable in view of the lack of accurate maps, elevation measurements or previous geologic studies. They had to complete the first survey in only 18 months, working largely on foot in a frontier with few roads or comforts.

"Geologists traveled by foot up until World War I," said Collins. "Even in the early 1900s, a state geologist might take a train to Steubenville and then head off into the country on foot, asking farmers at night for a place to sleep. In the late 1800s, state geologist John Newberry wrote that he would get off the train and, if the site he wanted to visit was eight miles or less, he'd walk; if it was more than eight miles, he'd rent a livery."

Even with a wagon, frontier geology required men as hard as the rocks they studied. John Locke, one of Mather's assistants in the first survey, wrote about settlers in Adams County trying to steal his horse and then forcing his wagon off the road, where it tipped over.

"Having my barometer slung to my back, and taking care of it and my son, I received the shock upon my hip bent laterally, which, although the bones were neither broken or dislocated, was so much injured as to give acute pain, and disable me from walking," he complained in his notes.

Referring to the standard of frontier inns and hotels, Locke regretted "being compelled often to lodge at a nasty drunkery, nauseated with tobacco smoke, and kept awake by nocturnal bacchanals."

According to Hansen's articles in *Ohio Geology Newsletter*, conditions didn't improve much in the 20th century.

A staff geologist during the first years of this century walked the length of an outcrop from Lawrence County to Columbiana County, more than 200 miles, because his superiors refused to let him buy a horse and wagon. Hansen writes that the same geologist "relayed his experience at one local farm house where the bed bugs were so bad that he spent the night under a tree."

THE SURVEY was a part-time job well into the 20th century. Geologists divided their time between field studies, teaching and writing.

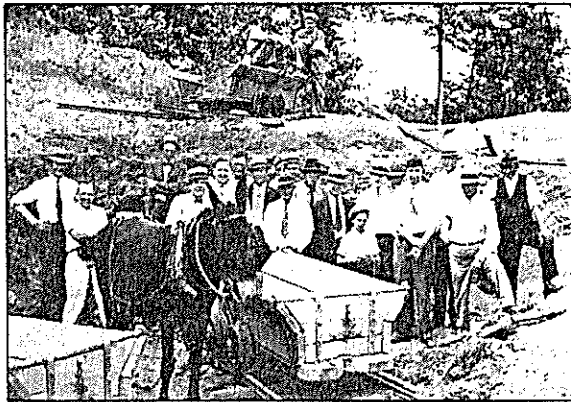
Mather came to Ohio after working for the New York Geological Survey and wound up splitting his time between state-sponsored research for Ohio, New York and Kentucky.

Newberry's tenure was marked by controversy, partly because he retained his professorship at Columbia College in New York while working in Ohio, Hansen said. And Newberry's successor was Edward Orton Sr., whose primary wage came from being professor and president at the new Ohio State University.

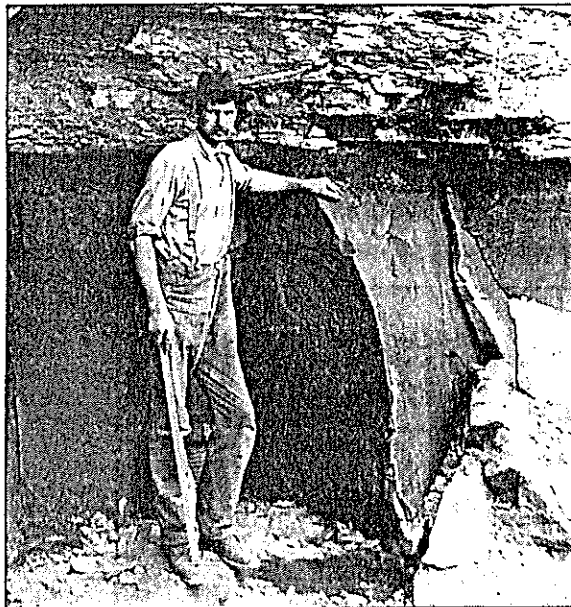
Orton operated the survey out of his home, but permanent offices and laboratories were established in Orton Hall at OSU during the term of his son, Edward Orton Jr., who was dean of engineering at the turn of the century.

Wilber Stout became the first full-time state geologist in 1928, but the office remained on the OSU campus until 1962, when it moved to Grandview Ave. In 1973, the state Department of Natural Resources consoli-

Ohio's first state geologist, William W. Mather, produced a wealth of data — and found himself out of a job.



Ohio Geological Survey photo  
Workers pause during clay inspection in Lawrence County.



Ohio Geological Survey photo  
Charting the layers at Havens Quarry in Newark. Photos are not dated.

dated its divisions at the Fountain Square complex off Morse Rd.

TODAY, AT Fountain Square, the survey is Columbus' least-appreciated museum and library. Displays of rock, mineral and fossil samples adorn the corridors; the survey's publications office churns out not only technical bulletins but public primers on a variety of topics, including earthquakes, fossils and travel guides to roadside geology.

Although the minerals industry has always been the primary client, the survey spends more time these days advising local and state agencies

on construction projects. Detailed geologic maps being prepared for all 88 counties will be valuable, for example, in placing future landfills and waste-disposal facilities, Collins said.

Survey research was improved dramatically last year by the acquisition of a modern drilling rig that can reach depths of 4,700 feet. This machine, for example, is an important factor in Ohio's efforts to acquire a

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**SURVEY** next page

*Draft*

Orton, Edward Francis Baxter (9 Mar. 1829 - 16 Oct. 1899), geologist, was born in Deposit (Delaware County), New York, the son of Congregational minister Samuel Gibbs Orton and Clara Gregory. The family lived in two small towns in New York state until 1833, when the father became pastor of the Presbyterian church in Ripley, New York, on Lake Erie. The boy was accustomed to the rural life of farming communities. He was tutored by his father and attended academies in nearby Westfield and Fredonia.

When he was sixteen, he entered Hamilton College as a sophomore and received the M.A. in 1848 (at age nineteen). He intended to go into the ministry but over the next few years began having serious doubts over his religious views. He taught for a year at an academy in Erie, Pennsylvania, and then entered Lane Theological Seminary in Cincinnati, Ohio, in 1849 but left because of eye trouble. He taught natural sciences at Delaware Institute in Franklin, New York, then was a student at Harvard's Lawrence Scientific School for six months in 1852, and went on to Andover Seminary. He married Mary M. Jennings in 1855; they had four children.

Ordained as a Presbyterian minister, Orton served as pastor of a church in Downsville, New York, in 1856, and later that year became professor of natural sciences at New York State Normal School in Albany. Objections arose to his "liberal tendencies in theology," so in 1859 Orton resigned. At what may have been about this time he changed to the Unitarian religion. He became principal of Chester Academy in Orange County, New York until 1865. Invited by a close friend, Reverend Austin Craig, who had become acting president of Antioch College in Yellow Springs, Ohio, Orton went there in 1865. He considered the move westward a great release from bigotry: "The prison doors are at last opened for me" (quoted by his biographer I. C. White).

Orton was successively principal of the preparatory department, professor of natural history, and in 1872 president of Antioch. He began geologic researches in Ohio, at first for teaching purposes. In 1869 he was asked to participate in the just-established Second Geological Survey of Ohio that was directed by John Strong Newberry of Columbia University.

When Ohio began to found an Agricultural and Mechanical College as a land-grant college in the early 1870s, Orton accepted the offer in 1873 to become its first president, as well as professor of geology. Some of the already established colleges in Ohio considered the new one "an unwelcome interloper," according to White, who credited Orton with "infinite tact, patience, labor and wise

leadership" in the early years. He was granted considerable autonomy by the board of trustees. "The curriculum was planned," said Orton's biographer John J. Stevenson, "not with a view to bringing the greatest number of students at the earliest moment, but with a view to the advantage of the state and of higher education." The number of students and the scope of the college increased quickly, so that in 1878 it was renamed Ohio State University. When Orton stepped down as its president in 1881, he continued as professor of geology until his death. Orton's wife died in 1873 and two years later he married Anna Davenport Torrey; they had two children.

For the state geological survey, Orton was first assigned to describe the geology of the southwestern quarter of Ohio. When Newberry ended his work in 1874, Orton continued with field work and edited reports on completed regions. In 1882 he was instructed by the state legislature to complete those reports under a third establishment of a geological survey, and the next year he was appointed state geologist, while continuing at the university. He continued in that appointment for the rest of his life. Newberry had tended to emphasize his own interests in paleontology, an expensive subject to illustrate in reports and not of practical importance. Orton, "ever in close sympathy and touch with the common people" (said White), recognized the value to the state of determining its economic materials, so he first concentrated his efforts on iron ores, building stones, lime, gypsum, clays, and coal. He published the results quickly in Ohio state survey reports. Unlike Newberry, he adopted the information on stratigraphy of the coal beds that had been determined by Israel Charles White along the boundary of Pennsylvania and Ohio and in the 1884 report of the Ohio survey Orton gave a "masterly presentation of the whole Carboniferous series in Ohio" that very much clarified the geologic relationships with adjoining states. After 1884, when natural gas and oil had become significant in the country, he put special emphasis on those and coordinated the information with adjacent states. He supported White again in his anticlinal theory of the nature of the origin of oil and gas, which helped to convince other geologists. Orton was requested by geologists of state surveys in Kentucky and New York to examine their potential oil and gas fields. He urged (unsuccessfully) the conservation of mineral resources.

Orton's geologic competence was chiefly in painstaking and exact observation. His biographer G. K. Gilbert noted: "His contributions to theory came late, were few in number, and were

broadly founded on the facts of his own observation. He never entered the field of speculation."


A modest person of courteous manners and keen consideration for others, Orton was noted by colleagues as one who showed good judgment in dealing with people and a person of fine command of written and spoken language. He was often asked to speak to farmers' groups and teachers' institutes. At Ohio State University he gave Sunday lectures for students who chose not to attend local churches.

Orton was president of the Geological Society of America in 1897 and president of the American Association for the Advancement of Science in his final year. He died in Columbus, Ohio.

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## Orton

eventually made St. Louis the dominant grain center of the Mississippi Valley.

After the war he dispatched the first grain shipment to Europe by way of the Mississippi River, sending a cargo of 12,000 bushels in 1866. This venture was at first financially unprofitable, but the benefits to St. Louis were important. He frequently addressed business meetings and spoke in private to urge that St. Louis engage in the export trade by way of the Mississippi and the Gulf of Mexico. In furtherance of this project he was instrumental in laying a petition before Congress for river and harbor improvements. He prevailed upon the Illinois Central Railroad and other lines to build more adequate grain terminal facilities in New Orleans and other cities. Making St. Louis the center of his organization, he established branches in many cities in the United States and Europe. He owned the Victoria elevator and mill in St. Louis, several elevators in Kansas City, New Orleans, Galveston, Seneca, Mo., and New York City. He also owned a large tract of land in St. Claire County, Mo. He was interested in the Southern Electric Railway Company of which he was president, and at one time held a very large interest in the National Railway Company. He was president of the Merchants Exchange and a director in the German Savings Bank of St. Louis. He early affiliated himself with the Democratic party, and later became what was known as a "Sound Money Democrat." He was a member of the Church of the United Brethren in Christ. He married Caroline Nulsen, daughter of John C. Nulsen, in 1866, and they had six sons and three daughters. He died at his home in St. Louis at the close of his sixtieth year.

[*St. Louis Post-Dispatch*, Dec. 28, 29, 1898; *St. Louis Globe-Democrat*, Dec. 29, 1898; *St. Louis Republic*, Dec. 29, 1898; Wm. Hyde and H. L. Conard, *Encyc. of the Hist. of St. Louis* (1899), III, 1678.]

O. B.

**ORTON, EDWARD FRANCIS BAXTER** (Mar. 9, 1829–Oct. 16, 1899), geologist, educator, son of Samuel Gibbs and Clara (Gregory) Orton, was born in Deposit, Delaware County, N. Y. After early manhood he was known simply as Edward Orton. His father was a Presbyterian clergyman, a descendant of Thomas Orton, one of the early settlers of Windsor, Conn. Edward's boyhood was passed mostly in Ripley, N. Y., where his father was then settled. He was fitted for college under his father's tuition and in the academies of Westfield and Fredonia. Entering Hamilton College as a sophomore in 1845, he graduated with high standing in 1848. The year following he served as assistant prin-

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cipal in an academy at Erie, Pa., and during 1849–50 studied in Lane Theological Seminary, Cincinnati, Ohio, supporting himself meanwhile by tutoring. At the end of that time, owing to eye troubles and other causes, he withdrew and spent several months in outdoor life on a farm. Later, he made a sea voyage in a coasting vessel. In the spring of 1851 he became a teacher in the Delaware Literary Institute, Franklin, N. Y., but passed the year 1852–53 at the Lawrence Scientific School of Harvard University. The years 1853–54 found him again teaching in the Delaware Institute, but, still intent upon the ministry as a profession, he then entered the Andover (Mass.) Theological Seminary. Without graduating, he was ordained at Delhi, on Jan. 1, 1856, by the Delaware Presbytery.

So far as is recorded he had manifested no marked liking for the natural sciences prior to his entering the Lawrence Scientific School, where he was interested chiefly in chemistry and botany. In 1856, however, he became professor of natural sciences in the state normal school, Albany, N. Y. Charged with holding heretical views, he resigned at the end of three years, and from 1859 to 1865 was principal of an academy at Chester, Orange County, where his success was such that he was elected professor of natural history in Antioch College, Yellow Springs, Ohio, a position he continued to hold until chosen its president in 1872. Meanwhile, in 1869, he had been appointed an assistant on the Geological Survey of Ohio under John S. Newberry [q.v.], and in 1873 was made professor of geology and president of the newly established College of Agriculture and Mechanics, which in 1878 became the state university. In 1881 he voluntarily resigned his presidency, but he retained his professorship to the end of his life. In 1882, on the reorganization of the state survey, he was appointed state geologist, a position he held until his death seventeen years later.

Though his interest in geology developed late in life, yet as state geologist he was markedly successful, notwithstanding the delicate position in which he was placed in being called on to take up and complete the work of his former chief (Newberry). During his administration there were brought out volumes V to VII of the final reports of the survey; these differed in a marked degree from those of his predecessor in the attention given to economic problems, particularly clay, coal, oil, and gas. He was the first to point out in a convincing manner the essential conditions for the accumulation in the earth's crust of the last two substances and their true

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relations, and to warn of the probability of their exhaustion through a continuance of the wasteful practices then employed. He lived to see his forebodings become actualities.

As an administrator, Orton was a compelling force in the organization of the College of Agriculture and its subsequent development into the state university. He was a likable man; quiet in his manner and of a somewhat retiring nature. Sagacious, kindly, and conservative, he won out where a more aggressive man would have failed. His interest in the public welfare was deep, especially in matters of public health and conservation of resources. In his opposition to the reckless wasting of natural gas, he was a pioneer. In 1855 he married Mary M. Jennings of Franklin, N. Y., by whom he had four children; his wife died in 1873 and two years later he married Anna Davenport Torrey of Millbury, Mass., by whom he had two children. He suffered a stroke of paralysis early in December of 1881, which deprived him of the use of his left arm and caused a slight limp in his walk, but he retained his mental powers unimpaired until 1899 when, on Oct. 16, he died suddenly and painlessly.

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G. P. M.

ORTON, HARLOW SOUTH (Nov. 23, 1817-July 4, 1895), lawyer, jurist, was the son of Harlow N. Orton, M.D., and Grace (Marsh) Orton. He came of vigorous pioneer stock and was descended from Thomas Orton, an early settler in Connecticut. Both of his grandfathers were Baptist clergymen and fought in the Revolutionary War. He was born and reared on a farm in Madison County, N. Y., and after attending Hamilton Academy he spent two years (1835-37) at Madison University (now Colgate University). For one year he taught in and had charge of Paris Academy in Bourbon County, Ky. He completed his preparation for the bar in the law office of his brother, Myron H. Orton, in La Porte, Ind., where he was admitted in 1838. On July 5, 1839, he was married to Elizabeth Cheney, daughter of a prosperous Maryland planter. He was keenly interested in politics and was an active member of the Whig party, although after 1854 he was an independent Democrat. In 1840 he made nearly one hundred speeches advocating the election of General Har-

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ison. In 1843 the governor of Indiana appointed him probate judge of Porter County. He commenced the practice of law in Milwaukee, Wis., in 1847, and six years later became private secretary to Governor Leonard J. Farwell. He then removed to Madison, Wis., where he continued to reside until the time of his death.

In 1854 he was elected a member of the Assembly. The following year he was retained in the case of *Attorney General ex rel. Bashford vs. Barstow* (4 Wis., 567), one of the early important cases establishing the right of the judiciary to determine the legality of the election of officers of a coordinate branch of the government. The fact that he was employed as counsel indicates his standing at the bar. He was associated with and opposed to the ablest lawyers of the Wisconsin of his day and played a leading part in the trial of this novel and celebrated case. He was also retained in the so-called Granger Case, *Attorney General vs. Railroad Companies* (35 Wis., 425). With other eminent counsel he represented the state. In 1859 he was elected judge of the ninth judicial circuit, was reelected without opposition, but resigned the office in 1865 to resume the general practice of his profession. He was again elected to the legislature in 1869 and in 1871. In 1876 he was an unsuccessful candidate of the Democratic party for a seat in Congress and in the same year was appointed one of the committee which compiled the *Revised Statutes of the State of Wisconsin* (1878). From 1869 to 1874 he was dean of the law school of the University of Wisconsin, from which institution he received in 1869 the degree of LL.D. He continued the practice of his profession until April 1878, when he was elected a justice of the supreme court of Wisconsin. He became its chief justice in January 1894 and continued to occupy that position until his death.

Physically Orton was a man of powerful rugged frame and was possessed of tremendous energy and vitality. Intellectually he was keen, alert, and vigorous almost to the point of aggressiveness. He possessed in extraordinary degree the ability to express his thoughts in forcible and striking language. Generous, warm-hearted, somewhat impulsive, he had a strong sense of justice and right. With a firm and positive character he combined open-mindedness and the power of listening sympathetically to the views of others. He was not regarded by his contemporaries or those who followed him as a profound student of the law. It was as an advocate that he excelled, so that he was markedly successful in jury trials and in forensic contests where appeals to public feeling and opinion were

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