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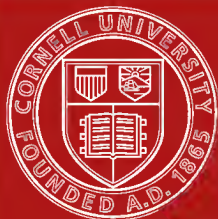
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Edward Orton

In Memoriam

Edward Orton, Ph. D., LL. D.

Addresses Delivered

AT THE

Ohio State University

Sunday, November 26, 1899

COLUMBUS

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Biographical Sketch

Edward Orton, teacher and geologist, was born in Deposit, N. Y., March 9, 1829. He was the son of Rev. Samuel Gibbs Orton, D. D. and Clara (Gregory) Orton. Both parents came of substantial families of English stock long resident in this country. The father was for half a century an active and successful clergyman of the Presbyterian denomination and spent the years of his ministry in central and western New York. From 1837 to 1853 he was settled at Ripley, N. Y. Here Edward Orton spent most of his youth, and and was fitted for College under the tuition of his father and by study in the neighboring academies of Westfield and Fredonia. He entered the Sophomore class of Hamilton College (his father's alma mater) in 1845 and graduated with very high standing in 1848. The year 1848-49 he spent as assistant in an academy at Erie, Pa., of which his classmate, John H. Black, was principal. During 1849-50 he was a student in Lane Theological Seminary at Cincinnati, O. Here he

came under the instruction of Dr. Lyman Beecher (under whose ministry his father had been "converted") and Prof. Calvin E. Stowe. It appears that he supported himself by tutoring, and was active in mission work. At the end of the year, owing to temporary failing of eyesight and, perhaps, because of incipient doubt as to the truth of Calvinism, he withdrew, and spent some months upon a farm, and in the out-door life of which he was always fond. Later in the year he made a voyage, perhaps as purser or super-cargo, in a coasting vessel as far, at least, as Tampa, Florida, and brought back a more pronounced abhorrence of African slavery.

In the spring of 1851 Mr. Orton became a teacher in the Delaware Literary Institute, a flourishing academy at Franklin, N. Y. He taught there many subjects with marked success. His growing taste for the natural sciences caused him to spend the year 1852-53 in the Lawrence Scientific School of Harvard University. There his attention was chiefly directed to chemistry and botany, in which his instructors were Gray, Horsford and Cooke. It does not appear that Mr. Orton heard lectures from Agassiz, who was absent from Cambridge during the years 1851-53. The year 1853-54 saw Mr. Orton again a teacher at the Delaware Institute, but his intention of entering the ministry led him to spend the

following year in the Andover Theological Seminary of which Dr. E. A. Park was then the central figure. Mr. Orton spent only one year at Andover and did not graduate. He made there one lifelong friend, Dr. John Bascom, later Professor at Williams and President of the University of Wisconsin. During the year 1855-56 Mr. Orton was pastor of the Presbyterian church at Downsville, Delaware Co., N. Y., and was ordained January 1, 1856, at Delhi, by Delaware Presbytery.

In September 1856 he became Professor of the natural sciences in the State Normal School at Albany. This position he was constrained to resign at the end of three years of successful service. He was charged with holding heretical opinions. From 1859 to 1865 Mr. Orton was principal of an academy at Chester, Orange Co., N. Y., and his reputation was so enhanced by the success of the school that in 1865 he was elected Professor of Natural History in Antioch College, Yellow Springs, O. This position he held until he was chosen President of Antioch, June, 1872. In 1869 Governor Hayes had appointed him one of the Assistants upon the Geological Survey of Ohio. In 1873 Mr. Orton was elected Professor of Geology and President of the new Agricultural and Mechanical College, located at Columbus. Of this institution, which in 1878 became the Ohio State University, he remained President until 1881

when he resigned the presidency, but retained the chair of Geology until the end of his life.

In the summer of 1874 he went to Europe and traveled in England and on the Continent. Upon the reorganization of the State Geological Survey in 1882 Dr. Orton became its chief and held the office of State Geologist for the remainder of his life. Volumes 5, 6, and 7 of the final Reports of the Geological Survey, two Annual Reports and other special ones were brought out under his direction. During these later years his attention was directed chiefly to Economic Geology. He gave, also, much time and thought to the problems of sewage disposal and public water supply as affecting the public health of the community and the state at large. Early in December, 1891, he delivered a public lecture at Antioch College and while returning to Columbus suffered a stroke of paralysis which wholly deprived him of the use of his left arm and caused a decided limp in his gait, but left his mental powers unimpaired. During the early autumn of 1899 Dr. Orton's health failed perceptibly, yet he was spared a long illness and retained his faculties to the end, which came suddenly and almost painlessly, Oct. 16, 1899. "He died, as he lived, with the simple dignity and fortitude of a Christian gentleman."

Dr. Orton married, 1855, Mary M. Jennings, of Franklin, N. Y., who died in 1873. Four children,

all of whom are living, were the fruit of this marriage. In 1875 he married Anna Torrey, of Milbury, Mass., who, with two children, survives him.

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 mental exertion. His dignity of manner and strong, intellectual face everywhere gave him distinction. He was a member of many scientific bodies, among these were the Ohio Archæological 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, of which he was President, 1899.

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

A few of the occasional addresses, in which he was always singularly felicitous and effective, have been published.

Edward Orton, Educator

By THOMAS C. MENDENHALL, President of the
Worcester Polytechnic Institute.

I respond this afternoon to a summons difficult to obey but impossible to deny. I am reluctant to undertake what could be done so much better by others, but it is impossible for me to decline to join in doing honor to the memory of one whom I so much loved and admired, however feeble and inadequate my words may be.

My association with Dr. Orton extended thro' a period of nearly thirty years. Beginning as a casual acquaintance, such as is common among men engaged in the same occupation, it rapidly ripened into a friendship which, happily for me, grew in strength with the years as they passed. My most intimate personal relations with him existed during the earlier years of the Ohio State University, the institution to which he gave so large a share of his life's work and which today makes fitting acknowledgment of the value of

that work and of the irreparable loss which it has sustained in his death. Of Dr. Orton as one of the most eminent geologists of his time, of the splendid example which he set in the performance of the duties of plain citizenship, and of the many other striking characteristics of a career which is rarely paralleled, others will speak, and I will restrict myself, therefore, to remarks upon his earlier work in this University and his influence as an educator rather than as a specialist.

I firmly believe that no one can fully understand and fairly evaluate Dr. Orton's services to the University during the first ten years of its existence who was not himself in some way or other a part of its official organization during those years, and in close touch with methods and motives by which its future career was determined, and I must ask your indulgence in a brief statement of some of the conditions under which the institution came into existence.

The Act of Congress which created this and many other noble institutions of learning, having been passed in the most discouraging and gloomy year of the great civil war, did not receive immediate consideration and acceptance by many of the States, and in Ohio there was a delay of nearly ten years before those interested saw definite promise of the actual realization of their hopes. In the mean time and during the latter part of

this period there was much necessary and useful discussion in regard to the character and scope of the proposed school. Innumerable schemes for utilizing the prospective income were thrust upon the public, and there was much strength in support of a division of the fund among several existing institutions. The first Board of Trustees courageously resisted all attempts to destroy by disintegration, and it was finally determined that the institution should be located at Columbus and known as the Ohio Agricultural and Mechanical College.

The field of controversy was now greatly narrowed but was, perhaps, correspondingly more intense. The character of the work of the new school, the scope of its courses and their relation to the requirements of a liberal education were yet to be determined. On the one hand were those who urged a generous interpretation of the Act of 1862 and who believed that it was primarily intended to furnish the foundation of an institution which might in time become a great University for all of the people; that while in the provisions of the Act the nation had determined to fortify and invigorate the two great sources of the State's material prosperity, Agriculture and Manufactures, especial emphasis had also been placed upon the importance of fostering the more purely intellectual or culture components of a well-

rounded course of study, for it was specifically directed that these must not be neglected. On the other, was a considerable group of men equally honest, conscientious and well meaning, who wished to organize a school intensely practical in tone and atmosphere, in which even science would have found no place except as applied science, and which would have offered little opportunity to those, and fortunately there are many, who seek to show their right to labor in the higher regions of more purely intellectual activity. Both sides of this most important controversy were represented by strong men in the first Board of Trustees, and it is but justice to all to say that the conflict was waged in a manner worthy of the dignity of the occasion and of the great trust for which they had become responsible. I cannot here even refer to the various phases of this discussion or to those who were most active and influential in shaping the organization of the school, nor can I omit saying that to the first president of the Board of Trustees, Valentine B. Horton, and to Joseph Sullivant, then and long one of the leading citizens of Columbus and of Ohio, the University will ever be indebted for the exercise of a courage, tact and unwearying effort that went far to put the institution in the way of being what it has been, is, and is sure to be in the future. Fortunately they were supported by many others of the board

who in themselves represented liberal culture combined with a genuine democracy of feeling and a loyalty to the Commonwealth compelling the belief that nothing was too good for the children of the people.

The issue was made and met in the appointment of the first faculty of instruction; and in the selection of the first presiding officer Fortune was singularly favorable to the new school. A Professor in a New England College who had received the highest political honors his State could confer upon him had been invited to become the President of the College but circumstances arose which made his acceptance impossible. Dr. Orton had been in Ohio only a few years but he had become widely and well known, not only on account of his accomplishments as a geologist, but as well by his charming personal qualities, and he had been already chosen to fill the Chair of Geology. To him the Trustees now turned and he reluctantly consented to be the first President of the Ohio Agricultural and Mechanical College. I say reluctantly, for it was well known among his friends and associates that he was loath to assume administrative duties which must necessarily interfere with the continued pursuit of his specialty in which he was already recognized as an authority. Happily for the institution, he yielded his personal

preferences and for eight years he was at once president and professor.

Among the several thousand young men who crossed college thresholds in Ohio in the Autumn of 1873, seventeen entered the building in which we now are and enrolled themselves as students, the first of the many thousands who have since followed their example. I cannot describe and few can appreciate the many trials and difficulties of those earlier years. The institution was practically unknown, even among those from whom its patronage was most likely to come. It stood for a new departure in education which was just entering upon its experimental stage and with few exceptions it was looked upon with suspicion by other Colleges in the State. The members of its first Faculty, of whom only four are now living, were mostly young men, full of ambition and enthusiasm for their work and thoroughly in harmony with the spirit of the time, for even then had come the dawn of the marvelous last quarter of the wonderful Nineteenth Century, a period during which, short as it is, the relation of man to the material universe to which he belongs has undergone a far greater change than in any other period in history. It is often, indeed generally, possible in looking backward upon things accomplished to see many mistakes that might have been avoided and many opportunities not properly

utilized. As I review, however, the principal events of Dr. Orton's presidency of this institution I am at a loss to say, even with the better knowledge that accompanies retrospection, how the many emergencies that presented themselves could have been met more wisely. To begin with, his standard of educational work was of the highest type. He fully realized that the success of the institution depended on the establishment and maintenance of a standard of scholarship so high as to compel the respect of the best educational forces not only at home but abroad. Himself a scholar in the broadest, best and most exacting sense, he encouraged Faculty and students to seek the best ideals, and no one of them who gave the slightest indication of the possession of the divine afflatus in learning ever failed of appreciative recognition from him. He believed that the character of an educational institution should be judged by the quality of its work rather than by the number of students enrolled in the annual catalogue, a principle which everybody admits and nearly everybody ignores. To stand up for it and to it, especially during the early struggling years of a college, demands a courage that few possess. That Dr. Orton did this, even under the most trying conditions, I set down as, on the whole, the most notable characteristic of his career as president. For I am thoroughly convinced

that if he had chosen to do otherwise, if the doors had been opened wide, at both ends of the curriculum, the institution would have long since sunk into a deserved oblivion.

Few college presidents have so continuously received the loyal support and sympathy of their colleagues in the faculty as did Dr. Orton. A college faculty is not likely to shine as an example of meek and amiable submissiveness, and this is particularly true of one composed, as this was, and many are today, of specialists. Twenty-five years ago, and earlier, it was usually believed that a college professor might fill any chair that happened to be vacant, and indeed more or less regular interchange of duties was often regarded as highly desirable. The passing of this era is to be attributed in a large measure to the example and influence of institutions of which this is a type. The specialist, however, is tolerably certain to hold that his own particular department is of far greater importance than any other and he may be relied upon to desire and demand a large share of available resources to aid in its development. Upon the president falls the by no means agreeable task of apportionment and restraint and this duty was discharged by Dr. Orton with rare discrimination, fairness and tact. No mere administrator, however skilled in that capacity, could have done as well. His scholarship was

thorough and yet broad enough to enable him to know what was being well or indifferently done in every department, and is there not a free-masonry among scholars which makes mutual recognition easy even when there is no common language? I am reluctant to refer to my own personal experience on an occasion which is completely filled with one personality, but I can never forget the many instances in which I received from him encouragement in the way of sympathetic acknowledgement and often praise, for work which was doubtless trivial and unimportant, but the recognized success of which served to keep alive the fires of ambition, enthusiasm and interest.

Of Dr. Orton's relation to the students, whose numbers multiplied many times during his presidential period, it is hardly necessary to speak. Too often the president of a college is unfortunate in that he rarely comes in close relations with students except to administer reproof or define restraint. The discipline of this college in its early years was nearly as great a departure from accepted traditions as were its methods of instruction. A large degree of freedom was allowed without the asking, but the line separating liberty from license was sharply defined. It was intended to cultivate a spirit of manly self reliance together with a full knowledge of the responsibil-

ities of citizenship, and the administration of the few simple regulations was always so just and fair that no ground for complaint could be found. In this as in all of his relations with others Dr. Orton believed in the efficacy of reason and in the doctrine that it is generally more important to convince a young man that he has done wrong than to punish him for so doing. He was slow to condemn and reluctant to punish, but I have known few men more inflexible and unflinching when a vital principle was contested. He won the confidence of all with whom he came in contact, and young and old valued his judgment and advice. As a teacher he was most inspiring. His literary and linguistic powers were unusual and he easily made any topic attractive, even to the dull. From hundreds of his pupils comes the testimony that to him they owe the first quickening of their intellectual life, the earliest revelation of their own moral obligations and responsibilities. There can be no higher praise than this.

Complete as was Dr. Orton's success in everything concerning the internal management of the college, his services as its representative in all of its relations to the outside world were of far greater importance. The young institution was but coldly received at first and this was especially true among those who ought to have been its friends. There were numerous harsh and unjust criticisms

of its courses of study, its Faculty, its Board of Trustees, and it was even attempted by a few men of influence to make it a football of partisan politics, so that its organization might be completely changed with every change in State administration. Against these and many other adverse conditions its Board of Trustees, President and Faculty had to contend. The confidence of the people had to be won and was won, largely by the strenuous but tactful efforts of the president. An eloquent exponent of the progress of scientific thought, in more departments than one, Dr. Orton was everywhere welcome upon the lecture platform. In cities, towns and villages, in Grange and Farmer's Institute, in Teachers' Convention and Literary Society, wherever men and women met to foster intellectual growth, he was heard with delight and approbation. His speech was choice, yet simple, clear and dignified, often rising to an eloquence, never of sound or mere words, but of noble thought. Fortunate, indeed, was the new college in having so splendid an exponent, and it is not strange that gradually but surely there came to its support a large and influential constituency from among the best people of the State.

Nor was there any lessening of his influence in its behalf when, after several attempts and against the wishes of the friends of the College, he in-

duced the Board of Trustees to relieve him of administrative duties and allow him to devote his entire time to his professorship. After that time much of his most important scientific work was done and as State Geologist he became, even more than before, familiar with every nook and corner of the State. His broad democracy of spirit and his generously helpful disposition combined to put him in close touch with the great industrial interests of Ohio, including man as well as matter. He knew the miner as well as the mine, and it would be difficult to measure the value to the University of his almost unique relations with the productive forces of the Commonwealth. The beautiful and noble building which bears his name and which, from this time on, will stand as a monument to his memory, bears witness, in the very stones of which it is composed, of the readiness with which these forces responded to his touch.

But still more enduring will be the traditions of his life and work in and about this institution, his charming personality, his felicitous speech, his lofty moral and intellectual ideals.

His title to high, perhaps highest, place among the great benefactors of the University, those who by wisdom and tact first made its existence possible and afterward its destruction forever impos-

sible, rests upon a foundation as solid as that of the rocks he so much loved.

“Say not of me that I am dead,” were the last words of a great English poet; “Say not of him that he is dead” are our words, today; speaking for the few who have been privileged to enjoy the most intimate personal friendship, as well as for the many, scattered over this broad land; for all of our lives have been better and will be better because of their having intermingled with his.

Edward Orton, Geologist

By GROVE K. GILBERT,
of the United States Geological Survey

It was in the autumn of 1869, just thirty years ago, that I first met Dr. Orton. In that year the Second Geological Survey of the State was inaugurated under the directorship of the late Professor Newberry; Governor Hayes named Dr. Orton as one of the two principal assistants for which the law made provision; and it was my own privilege to be accepted at the same time as a volunteer aid. In the arrangement of duties Dr. Orton took charge of work in the southwest quarter of the State and Dr. Newberry gave chief attention to the northeast quarter. Being assigned to Newberry's corps I had no opportunity to meet Dr. Orton until late in the season, when I had the good fortune to be bidden to attend a conference of the chiefs at Columbus. While on the journey from Cleveland Newberry prepared me for the meeting by sketching the quality and character of his colleague—a man without guile, direct in his conversation, and absolutely transparent as to

motive. The simplicity of manner which would impress me at the start was not of manner merely but was a fundamental trait coordinate with and not contradicted by the wisdom which made him a man of affairs. His sensitive conscience made him peculiarly careful to adhere to the facts of observation, and he was cautious and conservative in all his geologic work.

Newberry's description naturally made a strong impression, and in the conferences that followed it is probable that I gave as much attention to the man as to the subjects of discussion. Certain it is that the geologic themes have vanished from my memory while the picture of the man remains. In later years, as we met from time to time, as I listened to his voice in public address or read the papers that emanated from his pen, I was able to add here and there a detail which Newberry's sketch had failed to delineate, but no line of it was ever erased, and Orton has remained, for me, one of the safest and most open-minded of investigators and the simplest, kindest, and most lovable of men.

To what extent considerations of historical fitness may have determined the arrangement of today's exercises I do not know, but certainly there was peculiar propriety in giving first place to Orton's work as an educator. During the first half of his period of intellectual activity education

was the primary theme, and it was only in later years that geology assumed prominence. We are told that his first geologic observation was undertaken with the distinct purpose of increasing his efficiency as a teacher of geology, and in his early acquaintance with rocks and fossils his point of view was educational. Interest in geologic studies for their own sake was a matter of development, and many years elapsed before it assumed control in the determination of his fields of activity. This peculiarity of his introduction to the science in which he finally achieved distinction had much to do with the quality of his scientific work and scientific writings.

It determined, in the first place, that he should not specialize at the beginning of his career. In geology, as in medicine, there are general practitioners, broadly versed in the principles and particulars of the science, who are prepared to undertake and conduct investigations of great variety; and there are specialists, each devoted to some minor branch of the general subject, in which he works intensely and exhaustively. The specialist, restricting his attention thus to a narrow field, is almost necessarily a somewhat narrow man, and while his concentration of effort may lead to important results altogether unattainable by the general student, he is subject to great danger from lack of balance. The teacher of geology is

compelled, by his vocation, to acquaint himself with all branches of the subject, so that his view is necessarily broad; and if he is also an investigator in a special field he is comparatively exempt from the recognized dangers of specialization. Orton's early work as teacher and observer gave him the broad view. When he first became known to the scientific world as an investigator he was recognized at once as a general practitioner or all-round geologist, and when, in later years, his field was somewhat restricted and he became an expert in a special department, there was no danger that his narrow view would blind him to the recognition of the broader relations.

In somewhat similar way the method and phraseology of his scientific writings were determined by the compound character of his career. As a teacher he was called upon to present the principles of his science to beginners in scientific study; as a lecturer to popular audiences he was accustomed to the communication of scientific ideas in untechnical language; and as executive officer of academy, college, and university he had constantly to deal with men of affairs untrained in the technicalities of science. Thus ever in touch with the lay mind he was in no danger from the literary pitfalls which beset the recluse and the specialist. He wrote for the people in language which they could understand, and even when

presenting his scientific conclusions to brother geologists he found little need for those technical terms which are so apt to render science unintelligible to the general reader.

The manner of his introduction to the work of scientific investigation had its influence also on the quality of his work. As most of my audience are well aware, scientific investigation, or the endeavor to understand Nature, consists of two parts, observation and theory. We open our eyes to the facts, or phenomena as they are called, of Nature, and make record of what we see, and then we endeavor to explain the phenomena by discovering how they have come to be. We observe and we theorize. But while observation and theory may logically be distinguished, in practice they must be intimately combined or the best results are not secured. There are, indeed, observers who take little cognizance of theory; but the best observers have theory constantly in mind, and through consideration of the relation of their facts to theory have their vision sharpened and their attention guided to those things which are most important. And there are theorists, too, who are indifferent to facts, soaring untrammelled in the realms of imagination and speculation. But the successful theorist tests every hypothesis by scrupulously comparing it with the phenomena to which it pertains, and modifies or rejects it

when he discovers a discordance. It is by the observer who is also a theorist, and the theorist who is also an observer, that real progress is achieved.

As a teacher Orton derived from the literature of geology a body of theory which he complemented so far as practicable by personal observation of the rocks, minerals, and fossils that lay within his reach. Thus he trained himself early to habits of observation, and in all his later work kept in close touch with the phenomena of Nature. As an investigator he generalized freely, and did not shrink from the propounding of theories, but all of his theories were so broadly founded upon, and so faithfully verified by, the phenomena of observation that they came to the world as demonstrations which could not be gainsaid.

This far we have considered only Orton's work in pure science, but his work in applied science was of equal or greater importance, and it was in this field that his personality was most marked. I trust that you will bear with me in another digression at this point, for his life serves to illustrate certain peculiarities of the relation of man to science which are not always kept clearly in view.

It is a matter of common understanding that scientific knowledge, or knowledge of Nature, is the foundation of the material progress of the

race, but the method through which it serves this purpose is perhaps less broadly understood. Through research the body of "natural knowledge" has been created and is constantly increased. This body of knowledge is a storehouse from which mankind may draw that which they find useful, and from which they do, in fact, make drafts at every stage of progress. But the store of knowledge grows quite independently of the drafts which are made upon it. The utility of the individual grains of knowledge is not foreseen, and their accumulation is always much faster than their utilization. So far as we may judge the future by the past, only a small portion of the garnered knowledge will ever find practical application, and thus, from the purely utilitarian standpoint, there is an immense waste of energy in the prosecution of research. This only illustrates the general fact that mankind is a part of Nature, for in Nature the ways of progress are ever wasteful. The acorn is Nature's device to prevent the extermination of the oak, and an oak tree in its long life-time produces a myriad of fertile acorns, but only one of these, on the average, escapes all the dangers of immaturity so as to develop a perfect tree; the others fail for lack of opportunity, and so far as the continuance of the species concerned are wasted.

The gathering of this great store of natural knowledge, only part of which can serve the purposes of mankind, is called pure science. The utilization of such portion as may be found available constitutes applied science. If the practical ends of applied science constituted the only motive for labor in pure science, mankind would be appalled and discouraged by the enormity of the waste; but, fortunately for human progress, another motive exists in the love of knowledge for its own sake.

Every activity which is so often repeated as to become habitual affects mental constitution and may result in a corresponding sentiment, appetite, or instinct, which in turn becomes a motive for the activity. Take, for example, the fundamental act of eating, which is essential to preservation of life and is common to all animals. There has been developd in connection with it a desire to eat, or appetite, which for most sentient beings is the actual motive, there being no perception of the relation of food to life. Men associated in communities find advantage in the classification and division of labor so that each shall perform some one function for others as well as himself, being repaid through equivalent service by others. In order to exchange labor, or the products of labor, good faith is necessary, and cooperative living has accordingly developd the sentiment of honesty.

Moreover, as industrial organization makes each individual continually work for others more than for himself, there is developed in him a sentiment impelling him to do for others, the sentiment of altruism. Again, the importance of social aggregation in the evolution of all phases of human culture has led to the creation of great nations, and national existence has engendered national sentiment, the sentiment of patriotism, but the masses actuated by patriotism as a motive have little conception of the value of aggregation as a factor in human development.

In similar way scientific research as an essential to material progress has developed its own sentiment, the scientific sentiment, or the sentiment of acquiring knowledge for its own sake, and this is the motive of pure science. As honesty, altruism, and patriotism are sometimes carried to absurd limits, so as even to oppose the ends they normally tend to promote, so the scientific sentiment is liable to perversion; and there are not wanting scientists so devoted to the acquisition of knowledge that they are impatient of its application, and look with disdain on other scientists who strive to discover its uses.

In the application of natural knowledge to human uses material gain is usually in sight, and this supplies a motive so distinct from the altruistic sentiment of science that the same indi-

viduals are rarely votaries of both pure and applied science. Taking an illustration from the branch with which I am most familiar, the mining engineers, occupied with the application of geologic knowledge and actuated primarily by the motive of material gain, are a distinct body of men from the geologists proper, occupied with the acquisition of geologic knowledge and actuated primarily by the scientific sentiment. There are, indeed, individuals who perform both functions, but as compared to the general body they are rare exceptions. Such an exception was Edward Orton, and he stands prominent among geologists as one actuated by altruistic motives not only in the acquisition of knowledge but in its application. Selecting, by preference, the geologic problems connected with the useful minerals stored in the strata of his State, he carried his work not merely to the inductions and theories of pure science but to practical utilitarian applications, and these were freely given to the community he served. Through official reports, 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 askt.

Orton's work in geology so far as it is a matter of record, is largely connected with the survey of this State. For thirty years he was an officer of the State, and though not continuously engaged in its service nor always compensated in money for the work which he performed, it is believed that he devoted more time to its exploration and survey than any other geologist, and that his knowledge of the distribution, qualities, and structures of its rocks was correspondingly intimate and comprehensive. His reports are so numerous and extensive and pertain to so wide a range of topics that I shall leave their enumeration to the biographer and bibliographer and content myself with a simple outline.

As assistant geologist under the directorship of Professor Newberry he began work in 1869 in the southwest quarter of the State, called the Third District, and his labors were confined to this field for a number of years. Gradually, however, they were extended to coal fields farther east, and after the year 1882, when he practically assumed the functions of geologist in chief, the entire State was within his purview. He was also engaged for shorter periods in the investigation of oil and gas fields of Kentucky, Indiana, and New York, and he made reports to the United States Geological Survey and to the Eleventh Census of the United States on various economic resources of

Ohio and Indiana. His contributions to pure science were in part published by the Geological Society of America and by various scientific journals.

Among his writings are many discussions of the character, sequence, extent, and arrangement of the geologic formations underlying the State, and also of the deposits of drift which mantle the surface. He described in detail the geologic features of many counties, and he worked out and published the structure of most of the coal fields of the State, discussing not only the relations and extent of the seams but their practical qualities. During the last two decades he gave great attention to the development of petroleum and natural gas, treating the scientific and practical aspects of the Ohio fields with a thoroughness which I believe to be without parallel. At various times he studied and wrote upon the building stones, limestones, iron ores, rock water, gypsum, and clays of Ohio and other States, elucidating the geologic relations and usually pointing out also their economic bearings.

From the mass of material thus accessible I select for special mention a single contribution to pure and applied science, choosing the one with which his name is most frequently associated by brethren of the hammer at home and abroad. I refer to his study of the relations of gas, oil, and

brine in subterranean reservoirs. It was well known that the flow of oil from a well is often preceded or accompanied by the escape of gas; it was known that the life of an oil well was often terminated by the influx of water, and that this water, when derived from the same reservoir as the oil, was highly charged with mineral matter; it was known that the static pressure of natural gas in a well was usually the same for all wells of a group or district, and independent of the altitude of the opening; and partial explanations of these facts had been suggested by various students: but it remained for Orton to formulate a comprehensive theory explaining all the phenomena, and then, testing it by comparison with a series of measurements and other observations in the gas and oil fields of northern Ohio and Indiana, to place it on a sure and enduring basis. Like many another result of elaborate and successful investigation, his theory, when stated, appears so simple as to be almost axiomatic, and one is tempted to wonder why the common sense not only of geologists but of all concerned in the development of petroleum and natural gas had previously failed of its attainment; and yet nearly every part of it has been at one time or other the subject of attack and controversy.

Each stratum of porous rock containing a profitable store of oil and gas is sealed above by some

impervious layer, so that fluids can not escape upward, though it may communicate freely with the surface of the ground at a distant point, if only the communication involves an inverted siphon equivalent to the plumber's trap. Under these conditions the stratum constitutes a reservoir in which three fluids arrange themselves according to gravity; gas occupies the pores of the upper part, and is succeeded downward by oil, which in turn rests upon water. If the stratum reaches the surface of the ground at a place lying higher than the reservoir, the water supplied to it by rains exerts a pressure, in accordance with the familiar hydrostatic law, on the water in the reservoir, and this is communicated to the oil and gas. The gas is compressed until its elasticity counterpoises the weight of the column of water. If, now, a well is drilled so as to tap the reservoir at its highest point, gas rushes forth, being forced out by the pressure of the water. If a well reaches the reservoir in the zone occupied by oil, the oil is similarly forced upward, and may be discharged at the surface in case the pressure from the water is sufficient. If a boring taps the reservoir still lower, it reaches water, which is similarly forced upward and may flow at the surface. The water is always a brine, because, occupying a closed reservoir, it has no circulation and has been dissolving for ages the soluble minerals contained

within the rocks; and it is thus contrasted with the potable waters of artesian wells, which contain comparatively little mineral matter, because they are parts of an underground circulation and their sojourn within the rocks is comparatively brief. An ordinary artesian water does not rise in wells everywhere to the same height, the pressure, or head, diminishing as distance increases from the source of supply; but the stagnant brine underlying a body of petroleum is everywhere subject to the same pressure, and will rise to the same height in any well to which it has access. This principle is intimately related to the pressure under which gas escapes from a well, and its knowledge has been found of great practical value to the natural gas industry.

It follows from the theory, and it is also a matter of observation, that as the gas in a reservoir is drawn off through wells, the underlying oil and brine rise to take its place, and when the local store of gas has been exhausted the wells either produce oil or are flooded by brine.

With the demonstration of this theory the earlier idea, that gas was forced outward merely by its own elasticity and that it was generated in subterranean laboratories from fossil organic matter as rapidly as it escaped, was completely disproved. It became evident that the supply of gas in each reservoir was definitely limited; that if

once exhausted it could never be restored; that economy was required in the use of natural gas, as with any other resource; and that the folly which permitted it to escape freely to the atmosphere was also a crime. That such criminal and disastrous folly was actually perpetrated in most of the gas fields of northern Ohio and central Indiana was not the fault of Dr. Orton, who early sounded the note of warning and strenuously combated the infatuation of the well owners.

Of the high esteem in which Orton was held by his colleagues in scientific labor you are already aware. The Geological Society of America, an organization including the leading geologists of the continent, chose him as its president, to serve for the year 1897; the American Association for the Advancement of Science, foremost in importance among American scientific bodies, called him to the chair of its geologic section in 1885, and bestowed its highest office in the last year of his life. Even in his own country he was "not without honor."

Edward Orton, Administrator

By the HON. THOMAS J. GODFREY, of the Board of Trustees,
Ohio State University

During the life of the late Professor Edward Orton, and since his death, so much, biographical and eulogistic, has been said and written of him that it remains for a trustee but to speak of a few of his many noble deeds while connected with this institution.

As the first President of the Agricultural and Mechanical College, he had greater responsibility in planning and shaping its destiny, than any other man. All the time he was President, he was also the head of a department and did work in the class room. To deal successfully with faculty, students and trustees in his two-fold capacity, required administrative ability of the highest order.

When the conflict was on to settle whether the College was to be Agricultural and Mechanical ~~merely~~ or be a University, President Orton em-

phatically advocated the latter. When that was adopted irritating opposition lasted for years and is not wholly eradicated yet.

President Orton, in his logical and philosophical way, smiled at opposition and pressed his preference ; with what success is known to all. Had a man of opposite views or of less tact been President, we to-day would likely have an institution of but few departments.

In June 1878, when President Orton was delivering his address to the first class, an ex-trustee who had vigorously opposed the University idea, said to a trustee, "Do you hear what Orton is saying? He is taking the College as far as possible from God and the Farm." That man's devotion, mistaken as it was, was chiefly directed to the farm. He is dead and his idea of what a Land Grant College should be, virtually died before he did, while, as is verified by all these buildings, all this equipment, all these instructors, and these twelve hundred students, the ideas of Dr. Orton will live forever.

Dr. Orton ardently favored the change of name to State University, but did not claim to be a prime mover in the change. Few if any did more than he to secure the passage of the bill by the general assembly and to maintain and popularize it afterward. In May 1878, the old name and the old Board were legislated out and a new Board, com-

posed of seven inexperienced trustees, assumed control. All, at once saw, that President Orton, with his executive and professorial experience, was equal to the emergency.

Had the executive been less kind and less helpful, graver and more numerous mistakes would have been made. A month after the new Board came into office and when the College, by the fluctuations of legislation, had had four Boards in five years, Dr. Orton, in his commencement address said, meaning trustees, "Men do come and men do go" and, meaning the Professors: "but we are here forever," and then jocularly added, "I might not say this had we not all been reelected last night." His recommendations to the Board were systematic and condensed. He realized that the income was so meager that but a tithe of departmental appropriations needed could be granted. He placed the necessities of the University before the Board on paper in the order of their preference. He seldom remained long at a Board meeting. His paper alone was information sufficient as to which few of the many needs were most pressing. His suggestions and recommendations were so wise and conservative that, as a rule, they were adopted without debate.

After years of executive service "equaled by few and excelled by none," as he so aptly put it, he wished to "lay down the laboring oar" of the

presidency and devote his entire time to his specialty. From time to time he tendered his resignation and as often the document was referred back to the President. Finally the trustees saw that he was chafing and that unless relieved of the presidency he would likely go to fields more congenial. This could not be tolerated. His resignation was accepted and he was continued Professor of Geology until his death.

In his dealings with the Board as in his public lectures, he depended largely on his manuscript, and I never saw one who could use manuscript to better advantage. Once when he was addressing a graduating class in the old chapel, a violent blast of wind scattered his manuscript. For the moment things looked as if the speech was gone and that the speaker was in peril. He deliberately gathered his sheets together as well as could be and pleasantly said that the wind had taken away his thirteenthly.

Once in my house an hour before he was to begin a lecture on a subject of which he had forgotten more than his auditors knew, he was adjusting his manuscript to time, place and circumstances, I said to him that I feared his lecture would be too profound: that our people were not accustomed to deep lectures and that they preferred a rough and ready talk. He replied, that while I wished him to throw the manuscript away,

he know that he could tell the people more in an hour with it than without it.

He did not retire from the presidency with a mental reservation. After his retirement he was seldom seen by the trustees in session or individually. When his counsel was solicited, if given at all, it was in the most cautious and modest terms. His requests for his department were few and conservative. His mastery of the English enabled him to express his wishes and opinions in most fitting terms.

In the early days of the institution there were many lines of policy advocated—many opinions expressed and much said by those having no opinion. Few Professors, few trustees and fewer students of to-day realize the difficulty there was in handling that diversified “laboring oar” in the days of President Orton.

It is said that no man should be president until he has been professor; it is almost as true that no man should be professor until he has been president. Would that every professor had been president. Trustees could recline on flowery beds of ease.

While I am aware that extreme caution is sometimes mistaken for timidity, I feel safe in saying that, notwithstanding Doctor Orton’s great learning, long experience and rare influence among men, he was a timid man; and this no one realized

more than he. He frequently expressed greater confidence in others than he had in himself. More than once he said that he was not assertive or aggressive enough to be the executive of a great or growing University. In this he came nearer standing alone than on any other proposition. It is said of one of whom we all have heard and read, that he would mount his saddle in New York and ride nineteen days to talk with a man in Pittsburgh rather than write a letter. I will not say that Dr. Orton would do this, but I do know that less than a year ago he traveled more than one hundred miles from his home to consult rather than write.

He was several times my guest and I, more than once, partook of his hospitality. We had many talks and every time I was the beneficiary. He was ever willing to communicate his learning to others—was in his best element when contributing something to the world's store house of learning. He took as much interest in communicating information to those outside of his classroom as to the students within. Dr. Orton's master characteristic was his complete equipoise. Great as was his scholarship, his nobility of character exceeded his learning. He gave more successful attention to character making than any other person with whom I was ever associated.

Dr. Orton maintained confidential relations with the trustees till he peacefully fell into the arms of Him who said, "Come unto me all ye who are weary and heavy laden, and I will give you rest."

Edward Orton, Citizen

By WILLIAM H. SCOTT, Professor of Philosophy
in the Ohio State University

In that masterpiece of literary art and political idealism, the Republic of Plato, philosophers are made the rulers of the state. "Until philosophers are kings," said Plato, "or the kings and princes of the world have the spirit and power of philosophy, * * * cities will never escape from evil—no, nor, I should say, the human race; and then only will this ideal State of ours have a chance to exist."

"That is an absurd notion," you say. But wait till you hear what kind of a being it is that Plato calls a philosopher. Plato's philosopher is the man of wisdom, the man who is guided by reason, who can see reality, who can see, and does see, things as they are. This is the man that knows what justice is; and justice is the essential virtue and the glory of a state.

Few men are so well entitled by Plato's definition to be accounted philosophers as Edward Orton was. He was a wise man, a man guided by reason.

Think of him in a seat of political authority—the mayor of a city or the governor of a state. Would he not have justified Plato, and have proved to the minds of all that it is the philosophers, the wise men, who should be made rulers? As a college executive he showed his quality; but tho many generations have passed and several republics have come and gone since Plato's time, politics has not reached such a point of either wisdom or purity that the wise man is often chosen to the head of cities or states.

Yet there are avenues thru which such a man can make himself felt and can bring wisdom to bear on matters of public concern. Some of these Doctor Orton found and used. He realized that to be a citizen, tho but a private citizen, is to be charged with grave responsibilities; and as a citizen he strove to do, so far as in him lay, the wise man's part.

He made it a duty to cast his vote for the public good. To him the ballot was a moral force, to be held as a trust and to be used as an instrument of service to the public. He did not use it therefore to advance himself or to help in the triumph of a party, but to promote the best interests of the city, the state, and the nation. He was one of that heroic and growing body of citizens to whom party fealty is a far lighter obligation than fealty to honor, to character, to good government, and

who decide for themselves for what and for whom they will vote.

It was his custom to attend the primary elections in order to do what he could toward the nomination of good candidates. On one occasion of this kind a man in whom he had confidence as a champion of honest elections was arrested for challenging men who were trying to vote. Doctor Orton demanded his release; and on the officer's refusal he himself went with officer and prisoner, declaring that he would go all the way to the prison. The officer held out for a few squares, but he soon felt the pressure too strong for him and let his man go. Then Doctor Orton and his friend at once returned to resume their work at the polls.

But he was not content to use his influence merely to secure the choice of good officers. He felt it no less a duty to help officers, good or bad, in the performance of their functions. By private letters he would at opportune times commend them for some act of fidelity or courage, or would call their attention to something needing to be done, or would point out the best way of attaining some important end, or would give the weight of his counsel to prevent adoption of some unwise measure.

But his activity as a citizen extended to many things besides political elections and administration. He took a deep interest in the economic

welfare of the public, especially in the wise care of the public health and the public mineral resources.

His attention was directed many years ago to the dependence of health on water supply. His geological reports frequently mention the quantity and quality of the water in various sections of the state, sometimes giving an extended description of the existing conditions. The topic often found a place in his public addresses. One of the latest instances of his work in this field is the report of the committee on Water, of which he was chairman, read before the Columbus Board of Trade, March 1, 1898. In an address which accompanied the report he discussed the question of a water supply for the city in his own terse but comprehensive way. The subject of sewage disposal also, so closely connected with water supply, received intelligent and careful discussion at his hands.

It was in dealing with these subjects that he performed his chief service as a member of the Columbus Board of Trade. He became a member of that body in 1885. He served on the committee on Health and Sanitary Affairs continuously till 1891, and again in 1894; and from 1898 to the time of his death he was chairman of the committee on Water. In recognition of his eminence as a citizen the board of directors elected him as an honorary member of the organization in 1891.

Another subject which he felt to be of great public concern was the conservation of what he aptly termed 'the stored power of the world.' He pointed out 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. We have fallen heirs to accumulated mineral wealth which required centuries for its production and which can never be replaced except by similar agencies working thru similar periods of time. We have therefore no moral right to use it wastefully and thus deprive those who come after us of that portion of it which they would otherwise inherit. "Waste," said he, "is immorality."

To those in control of the coal fields of the state he addressed argument and appeal, laboring to impress on them the folly and the wickedness of leaving as they do, great quantities of fuel to be lost beyond all chance of recovery. He tried also to secure legislation which would compel the use of more economical methods of mining.

When natural gas was discovered in northwestern Ohio, many wells were allowed to burn day and night, consuming in a few weeks quantities of gas sufficient to meet all legitimate demands for many years. The most prodigal use was also made of it for manufacturing purposes, and many new enterprises were invited into the gas region with the promise of free fuel. Doctor Orton pro-

tested against this thoughtless waste, and tried to prevent it. Some ridiculed; others took offence. I quote a few sentences from his preface to volume VII, of the Geological Survey of Ohio: 'These warnings were disregarded; in one or two instances they were even resented. * * * The event has proved, however, that the facts that were then apparent were correctly interpreted. The decline went on steadily. Most of the glass factories, for example, that were brought into the district on the promise of free fuel have been abandoned or removed. The few that remain are eking out the feeble supply of gas with coal, wood and oil.'

In respect both to sanitary welfare and to natural resources he held that it is the duty of those who know to inform and protect those who do not know. These questions, and all questions, were for him moral questions. But there are some subjects which he regarded as eminently moral; because they concern primarily, not man's material, but his moral, well-being. He regarded moral interests as incomparably more important than material interests. That missionary spirit which put him in the ministry when he was a young man never died out of him. It was forever stirring within him and forever seeking a way to express itself. Sometimes it found a regular outlet, as in the instruction of a Bible class. At other times

it would smoulder awhile, and then, waxing and rising and getting possession of him, it would at last find a definite and inspired form for itself in a lecture.

After he came to Columbus to assume the Presidency of this institution he became the teacher of a large class of convicts in the penitentiary. He kept up this work for several years, and his active interest in some members of the class and his relations with them continued after their release. In the early years of the University he formed a Sunday class of students. The churches were at that time remote and difficult to reach, and he felt it incumbent on him to provide those students whose homes were not in Columbus with religious instruction. From time to time also in later years he taught on Sunday in a public or semi-public way.

It seems to me that the most adequate and satisfactory form of expression which he found for himself was the public lecture. In my eyes he never rose to so great a mental and moral height and took on so great mental and moral proportions as he did in some of the Sunday afternoon lectures which he delivered here in the University. There was in them a breadth and elevation of thought, a spirituality and earnestness of tone, and a force and fitness of utterance, which, if I judge aright, revealed him at his best. I need but recall the

last and perhaps the best remembered, the one spoken from this platform some three years ago on "Man's Place in Nature."

In all these and many minor ways he endeavored to fulfill his own large conception of what it is to be a citizen. Do you not agree with me that as a citizen he acted well the part of a wise man? Here was a man to whom civic duty was sacred; and in trying to perform it, what a citizen he showed himself to be—many-sided, large-sighted, vigilant, strenuous, self-sacrificing, courageous! To help the community at all times and in all ways—to secure for it better water, better streets, better schools, better government; to extricate its poor from their poverty and its vicious from their vice; to raise its standard of intelligence; to purify its morals; to encourage those who were trying to promote these ends;—all these and more found place in his busy life; and they were done with his might, and with his mind, and with his heart, and with his conscience.

What I have said, if left uncorrected by another view, might leave the impression that his thoughts and activities were lacking in breadth. He was indeed a man of the present. He found his task now and here. But he also walked and worked with far horizons of thought and hope in his eye. The political affairs of the state and the nation concerned him no less than those of the city. He

was a citizen of the whole country,—nay, of the world. While he was a man of the present, his mind also swept the ages on ages not only of historic, but of geologic, time. Tho it seemed to him needful to think and speak of the sewer and the cesspool, his thoughts often towered to the summits of the rational, the spiritual, the ideal. Tho he saw and felt the wants of his community and was alive to the good or ill fortune of those immediately about him, he considered also the generations to come and dwelt upon the destinies of mankind.

In behalf of humanity he was an optimist. He was not blind or indifferent to the perils which threaten the progress of the race; but he believed that they would be met and overcome. In a passage of his noble address on the seventieth anniversary of his birth—his ‘*Morituri Salutamus*’ to his brethren of the University faculty—he uttered his hope for the world: “‘What is the outlook,’ do you ask, ‘at the end of your three score 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.” He was himself wide-visioned and far-visioned. His thoughts were at home anywhere

on the globe. They penetrated the centuries of the future. They ascended on high. Man, God, Eternity were in his heart.

Do you ask why he was so wise, so strong, so earnest, so brave, so philanthropic, so cosmopolitan, so every way admirable as a citizen? The answer is not far to seek : It was because he was so wise, so strong, so earnest, so brave, so philanthropic, so cosmopolitan, so every way admirable as a man.

May the spirit of Edward Orton, lover of good and lover of man, fall like the mantle of an ascending Elijah, on every teacher and every student of the University! May his influence continue to pervade this place—these buildings, this room, the minds and consciences of those who work here, now and hereafter! May it remind them while here to perform their work in a large and noble way, and when they go forth into a wider sphere, may it inspire and guide them to the wise and unwearied performance of the duties of a pure and patriotic citizenship!

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Edward Orton, the Associate

By SAMUEL C. DERBY,
Professor of Latin in the Ohio State University

It is no easy thing to appreciate properly the qualities of the humblest friend, how inadequate then, any attempt to estimate the personality of one who had unusual endowments of mind and heart! And today, even if such a task were not too difficult, our loss is too recent, our grief too keen, for us to be able to measure with cold precision the worth of this friend and co-worker. Our vision is still dim, our touch tremulous. In the attempt to appreciate the influence of such a man in relations, so close and so long continued, one can hope at most to do no more than sketch in faint outline a few of the salient features of that character, strong and sweet, which it was our high privilege here long to enjoy. Words may serve, perhaps, to set memory at work in the hearts of you who were close to him, and she with her vivid touch, shall fill in the outline with many a well-remembered trait and feature of that strenuous nature; to be satisfying, to be true to life

the portrait cannot be the work of another, it must embody your conception, and be in large measure your own creation and of your drawing, distinct and individual for each of you.

It is nearly thirty years since my acquaintance with Dr. Orton began—at Antioch College where he was then the most influential, and I the youngest member of its faculty. As an inmate of the President's household, during the earlier months of my life there, I had unusual opportunity to know how much that officer trusted to the practical wisdom of the alert and untiring professor of Natural History, who was also the head of the Preparatory Department in which a majority of the student body was enrolled. This man in distinction from the other professors, the President habitually designated as "Mr. Orton," just as he would have said "Mr. Emerson," or "Mr. Webster." Then as always Dr. Orton toiled terribly; much of the discipline of an unusually heterogeneous body of students rested upon him; his instruction was not confined to the natural sciences which gave name to his chair, but regularly included Latin, with History or English or a Normal class in Higher Arithmetic. His pupils there, as everywhere, were inspired with a good measure of his enthusiasm and carried forward by the forcefulness of his teaching: they thought his classes most attractive: they did not under-

stand then as clearly as in after years, that this was due less to the subject than to a great teacher, whose scientific attainments, unusual power of lucid exposition, and remarkable industry, all commended by an engaging personality, were beginning to be generally recognized throughout Ohio. "The day of small things,"—a phrase Dr. Orton often used, was for him drawing to a close. In 1869 Governor Hayes had appointed him upon the Geological Survey of the state; four years later he was called from Antioch to do a larger and more attractive work, as President of the new Agricultural and Mechanical College at Columbus. Of his service in that position another has spoken with intimate knowledge. I may be permitted to say that when I met him from time to time during the eight years of his presidency here, I was always impressed by the growing power, readiness of resource, and gracious dignity which, as if held in reserve,—the more urgent demands of the new field had called forth. This ability to meet the new and larger requirements of a higher position is one of the most conclusive tests of power,—that test Dr. Orton stood, no emergency found him wanting.

In 1881 I came again into close relations with Dr. Orton. His request to be relieved of the burden of the Presidency of the University, first made three years before, had been granted, and

he had taken up with undisguised satisfaction the less impeded pursuit of Geology and the work of the Geological Survey of which he was soon appointed the chief. From this time Dr. Orton avoided taking a conspicuous part in the ordinary deliberations of the Faculty, and it was only after urgent solicitation on the part of his colleagues and then, rarely and at critical moments, that the Ex-President could be induced to contribute his weighty and often decisive opinion. This reserve was due to no lack of interest in the important educational questions that arose, for that remained unabated—but, was owing partly to the feeling that his other pursuits demanded his whole strength, partly to an almost morbid sense of propriety which forbade him to influence College policy from a position of vantage. His associates appreciated this delicacy of feeling, but were not quite convinced that it was for the best interest of the University, to be regularly deprived of aid so potent and so wise.

In many ways during the years which followed, Dr. Orton did more for the University than ever before, and a service which no other could do so well. As was said of Emerson, "His friends were all who knew him." His ability to recall names and faces, to remember the occasions when he had met persons, and to hold in memory other facts personal to them and their households was

extraordinary. Every journey, every geological excursion renewed or extended his acquaintance among the most open-minded and intelligent citizens of Ohio. From the favorable impression thus made on so vast a number of influential persons the University has already reaped an abundant harvest, and the end is not yet. In the lecture room and museum his labors were greater and more effective than in earlier years, for he spoke as one having authority, and through his unceasing labors in gathering specimens from every quarter, and in arranging them to the best advantage, collections grew apace. Every student had towards him a feeling of pride and respect touched with reverence. His influence did not stop there. It is hardly credible that there was a teacher here who did not find help and incentive in his strenuous example.

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 ethics, in problems touching the public health;—he was wont to enquire what you had read that was of moment,

that had afforded you recreation or stimulus. You were fortunate indeed if his kindly but searching questions did not make it evident that even in your own field he had anticipated you.

Upon his table you would see the latest noteworthy treatises upon his favorite sciences, a famous novel by Mrs. Humphrey Ward, books on philosophy, and probably a manual of devotion. His interest in the progress of religious thought never ceased and he saw with much satisfaction modern theology grow in breadth and freedom from restrictive creeds. If you sympathized with this movement, he was likely to allude to its gains and latest phases. He was a strong champion of both science and religion: his spirit was devout, his thought free. The few glimpses we can catch of his early years of service all reveal the same earnest temper, the same intense devotion to a high ideal in life, the same determination to promote every good cause.

In the full tide of this fruitful and active life came the sudden blow by which, as he wrote to a friend, he "became an old man in a day." How valiantly he strove against partial helplessness, and unavoidable dependence upon his friends. With what patience, almost resignation he bore the resulting burden of disability,—few saw more clearly than his colleagues. During the years which passed before his final release, the pathos

of his fate did not grow less. He did his utmost without repining, but no one saw the inevitable result more clearly than he. More than ever he lived and wrought "as in the great Taskmaster's eye." Latterly I think he took a more hopeful view of the progress of human affairs towards the

"One far-off, divine event

To which the whole creation moves."

Last year upon the occasion of the 50th anniversary of his graduation at Hamilton College, Dr. Orton prepared a brief biography of each of his forty class-mates. His labor was amply repaid by the evidence thus gathered that even those members of the class who had apparently profited least by their College training, had yet come to be persons of note in their several communities and had led useful lives. This was to him peculiarly welcome testimony to the inherent worth of human nature and, incidentally, to the wholesome tendency of that liberal education to which most of his life had been devoted. And so with "honour, love, obedience, troops of friends," our colleague came to the allotted limit of "three score years and ten." His firm, wise guidance through the initial years of this University, had largely shaped its trend and scope; in its lecture rooms his unusual ability as a teacher had left deep impress upon his pupils; his large attainments and scientific labors had given it renown; the

high standard of work to which he rigidly held himself and others was a continual incentive to all its members. In wider relations his unfailing tact and considerateness towards all with whom he had to do, his lively interest in all movements for the good of his fellowmen, his fine and noble personality—all these elements and many more which were blended so perfectly in his character made Edward Orton peculiarly dear to his associates while he was spared to them, and will make his memory precious, now that they see him here no more.

“The shape erect is prone; forever stilled
The winning tongue; the forehead’s high-piled
heap,—

A cairn which every science helped to build,—
Unvalued will its golden secrets keep;
He knows at last if life or death be best:
Wherever he be flown, whatever vest
The being hath put on which lately here
So many-friended was, so full of cheer
To make men feel the Seeker’s noble zest,
We have not lost him all:—he is not gone
To the dumb herd of them that wholly die;
The beauty of his better self lives on
In minds he touched with fire, in many an eye
He trained to Truth’s exact severity;

He was a Teacher; why be grieved for him
Whose living word still stimulates the air?
In endless file shall loving scholars come
The glow of his transmitted touch to share,
And trace his features with an eye less dim
Than ours whose sense,—familiar wont makes
numb.”

