

MEMOIR
OF
JAMES EDWARD OLIVER.
1829-1895.

BY
G. W. HILL.

READ BEFORE THE NATIONAL ACADEMY, APRIL, 1896.

BIOGRAPHICAL MEMOIR OF JAMES EDWARD OLIVER.

JAMES EDWARD OLIVER was born in Portland, Maine, on July 27, 1829. He was the third child of James Oliver, of Lynn, Massachusetts, and Olivia Cobb, of Portland. Professor Oliver's ancestry is traced back in more than one line to the earliest settlers of Massachusetts. However, in the exclusive male line it is not known beyond his great-grandfather and great-grandmother, Henry and Abigail Oliver, "of the Old Church" of Marblehead. His paternal grandparents were Henry Oliver, of Marblehead, and Ruth Newhall, of Lynn, who passed the whole of their married life in the latter town. Mr. Oliver followed the profession of a school teacher and had a family of eleven children, the youngest of whom was the father of Professor Oliver. Through his mother Professor Oliver was descended from Henry Cobb, who came from England (probably from Kent) to Plymouth, Massachusetts, in 1629, afterwards removing, in 1633, to Scituate, and again, in 1639, to Barnstable, where he died, in 1679. Being a man of note, he held influential positions in the churches of these towns, and served as representative from 1645 to 1651. As his second wife he married a daughter of Thomas Hinkley, the last governor of Plymouth Colony before its union with that of Massachusetts Bay. Through her descended Edward Cobb, the maternal grandfather of the subject of this notice.* Another ancestor was Robert Pope, who came from Yorkshire, England, in the ship *Mary and John*, of London, in 1634. Of him it is recorded that in 1658 he was punished for attending Quaker meeting.†

Professor Oliver was born during a short residence of his parents in Portland. They returned to Lynn, probably in 1832, and spent the remainder of their lives there, where the elder Mr.

*The given names of the line of Cobbs are Henry, Jonathan, Samuel, Samuel, Samuel, Edward.

†The line through this ancestor is Robert, Joseph, Samuel, Samuel, Robert, Elijah, Phebe, Olivia, James Edward.

Oliver filled the post of cashier of the then principal bank of the place. The family were attached to the principles of the Society of Friends, which doubtless accounts for the overdevelopment, as some would think it, in the line of ethics of the subject of our notice.

James Edward was not rugged as a child, and we hear that he passed through several illnesses which threatened his life. On this account he was not sent early to school, having attained the age of seven before this occurred. However, he made good progress at home, his mother being his instructor. For this duty she was the better qualified as having been before her marriage a teacher in a school at Providence, Rhode Island. "Mother's geography," as James called it, was the cyclopedia of useful knowledge from which he obtained the elements of the sciences. It was a small volume which now would be quite contemned. As one would suspect from James' subsequent career, he was remarkably precocious, although his attention in his early years was not especially attracted to mathematics, possibly because its literature was not thrown in his way. He was rather interested in general science and literature. From his mother he imbibed an interest in astronomy, this being a favorite study with her. On being sent to school, his first teacher was surprised to find how large a fund of information he had acquired on a variety of subjects usually unattractive to children.

As has been the case with so many endowed with an intense intellectuality, he was in early childhood an inordinate reader of books, so much so as to endanger his health. In consequence the family physician counseled his being taken into the country and deprived of them for a season. Here upon a farm, encouraged to pass the time out of doors with some playmates, his health improved; but he could not refrain from expressing his satisfaction at his return home for the reason, as he said, "In the house in the country they have no book but a Bible." This was read at family prayers, and all other books kept from him. At this time he was not more than six years old. All through his earlier years the weakness of his body disposed him to a lethargic habit; he was disinclined to take the exercise which might have imparted strength. It was not until he entered the academy in Lynn, where he prepared for college, that he became robust. His defect of nearsightedness prevented his enjoy-

ing the rough games of his schoolfellows; he preferred to remain indoors and pass the time allowed for play in reading, though he did enjoy swimming, running on the beach, and climbing about in the rock and barberry pastures and woods which abound in the vicinity of Lynn. A little later on, while he took little physical exercise, his muscles were strong, he could climb a tree, and astonished the men at the fire-engine house by climbing up and sliding down their pole.

While still a youth his morbid development on the ethical side, as it would be considered by those destitute of fine philanthropic feeling, led him to take an interest in the anti-slavery, temperance, and anti-tobacco reforms. In regard to the first, he even went to the length of rigorous abstinence from the use of all products of slave labor, whether food or clothing. The somewhat grotesque picture is drawn of him, at five or six years of age, standing upon the counter of his father's banking-room eloquently expostulating with a group of men addicted to tobacco-smoking or to too much wine. The audience, more amused than convinced, to soothe his feelings would sometimes pretend acquiescence, and some would go to the length of promising to change their habits. Great was his disappointment when he learned all this was but mere pretense. Farther on in life he learned that it was not a good plan to wear one's heart on one's sleeve; but, although boyish enthusiasm was succeeded by calm judgment, he always remained extremely faithful to his conscientious convictions. In later days he was on terms of intimacy with the noted anti-slavery leaders of eastern Massachusetts, and was regarded by them as an efficient helper in forming the public sentiment which eventually compelled the removal of this peculiar institution from our country.

It must not be gathered from this that he was at all obtrusive in debate, for he had at this early age the same retiring disposition he maintained through life, never assuming any airs of superiority on account of seniority or larger acquaintance with the subject discussed, but always placing himself on the intellectual level of those with whom he conversed. Rarely would he take the lead in conversation, leaving that to some one else of the company. He was as remote as possible from browbeating an opponent in argument, but very ready on all occasions to afford his help in untying knotty questions.

In due course he was sent to the old Lynn Academy, a school more than a mile from his home. Here he prepared for college. The teacher of this institution at that time was Master Jacob Batchelder, commended as an excellent instructor by those who should know; no mere hearer of recitations, but one who stimulated his boys to independence of thought by his encouraging conversation—a rare sort of man in those days. Professor Oliver in after times always spoke of him with great gratitude and affection. Some ten years after his education at this academy ended, on March 12, 1856, a festival was granted to Mr. Batchelder by those who had enjoyed the benefit of his instruction. In Professor Oliver's poem for the occasion, printed in the local papers, are curiously joined poetic aspirations and description of former boyish sports about the old academy. Perhaps we may be pardoned for quoting the four concluding lines:

“Be we knit by one purpose, though scattered;
 And where sin, wrong, oppression appear,
 Be the rallying cry rung through our phalanx—
 ‘We, the children of Jacob, are here.’”

In 1846, at the age of seventeen, he entered Harvard College, passing into the sophomore class. Here we may suppose his attention was more particularly attracted to mathematics, the science he afterwards became famous in. We get the following characteristic picture of him and his connections at this period from the Hon. Horace Davis, formerly president of the University of California:

“Mr. Oliver was my room-mate during the last two years of my college course, and my close contact with him in this intimate relation brought me to a constantly increasing regard and respect for him. I never knew him until we met as classmates. He came from Lynn, his parents being old-fashioned Quakers. His father was cashier of a bank—a plain, straightforward man—and his mother a quiet, gentle lady, clad in the old-fashioned Quaker dress, with a calm, peaceful face, framed in old-style cap, such as was the fashion of that day. They lived over the bank, and there I used to visit them on Sundays, my father and mother being away much of the time in Washington.

“Oliver was a remarkable man in many respects. He had a strong individuality, amounting almost to eccentricity. He was

sturdy and independent in his thought, determined and conscientious in his conviction, yet he was modest, retiring in his demeanor, and his extreme nearsightedness increased this tendency. He was liked by everybody in the class, but his intimate friends were few, and mainly among the boys from the country. He was studious in his habits, especially in those branches he was fond of, and he pursued these with an avidity which made him neglect other studies, for he cared very little for his rank. His first love, of course, was mathematics, and next to that came ethics and moral philosophy. His forensic compositions were especially terse and clear, but mathematics he devoured with an eager appetite, and when, in his senior year, he was given the *Mécanique Céleste* to study he would often become so absorbed as to prolong his work into the small hours of the morning, and I have many times waked up from my first nap to see him still poring over the ponderous volume long after midnight.

“One Sunday when I was at Lynn his good mother took me aside, full of maternal tenderness, and said to me in her quiet Quaker way: ‘Davis, we know that James Edward sits up too late at night and we want thee to see that he goes to bed betimes.’ ‘But,’ I said, ‘Mrs. Oliver, James is older than I am and I have no authority over him.’ ‘Nay,’ said the good old lady, ‘but he has great respect for thee, and thee can give him some good counsel.’ On our way back to Cambridge I opened to him his mother’s remonstrances, and he promised he would keep better hours, though I knew it must have been much against the grain.

“My friend was an earnest reformer, and we often discussed the questions of the day, such as abolitionism and peace movements, during our long summer evening walks or on our Sunday strolls over the rocky hills and beside the beach at Lynn. He was too honest and sincere in his make to be anything but an abolitionist. To him no political necessity could disguise the inherent barbarity of slavery.

“There was in Oliver’s composition a deep vein of poetry mingled with his mathematics, as is not uncommon. The class made him their class-day poet, and were so pleased with his poem that they printed it to take home with them, something unusual in those days.

“Oliver was also a man of deep religious convictions, not dog-

matic, but broad and inclusive. His faith was firm and constant, and, wherever he went and whatever he did, he carried with him the consciousness of his Heavenly Father. In all my life I have never met a man who more sincerely lived up to his convictions, nor one in whom the milk of human kindness more thoroughly pervaded all his acts and life."

Professor Oliver graduated in 1849.

In the same year a new enterprise in astronomy was inaugurated in this country. Congress was persuaded to pass a bill creating a bureau of astronomical calculation. It was to be called the Office of the American Ephemeris and Nautical Almanac. Presumably Professor Benjamin Peirce and Admiral C. H. Davis were the prime movers in the matter. Nearly all the governments of western Europe, even that of so small a state as Portugal, published annually ephemerides of the principal heavenly bodies. It was represented that a proper regard for its dignity as a great civilized nation must lead the United States to follow this example; that our using an astronomical ephemeris published abroad was a subject of just reproach to us. By thus appealing to the national vanity of our legislators was this scheme made a success. No other argument would have served.

Mr. Oliver, having just graduated, naturally bethought himself of seeking some post in which his mathematical talents could be put to service. In this difficulty he sought counsel of his teacher, Professor Peirce, who proposed he should accept an assistantship in the Nautical Almanac Office, as doubtless the work would prove congenial to his taste. To this proposition Oliver readily acceded.

The office was established, in 1850, in Cambridge Massachusetts. This locality was selected because the neighboring libraries possessed a larger amount of astronomical literature than could be found at any other place in the country. Some of the assistants performed their work at the office, others at their homes, generally in the near neighborhood of Cambridge. Mr. Oliver was in the latter class. He lived at the home of his parents, on Green street, Lynn, where in his little study he did his work and received his friends. It was at this period of his life, in 1861, that I became acquainted with Mr. Oliver, meeting him at the Nautical Almanac Office whenever he chose to visit

us, which was about once a month. Coming in the morning, he would usually stay all day. The time was generally spent in discussing mathematical and astronomical subjects.

In spite of Professor Peirce's prediction, Oliver did not take kindly to the work necessitated by the publication of the American Ephemeris. He found the endless repetitions of the same arithmetical processes extremely wearisome. All that could be learned in this way was soon exhausted and the interest attached to the novelty of the work soon worn threadbare. It soon became drudgery to him, and he would rather have devoted his energies to original research in higher algebra. At the time I first met him I remember his conversation at the office was plentifully interlarded with the words *quantics*, *invariants*, *covariants*, *discriminants*, and the like. When Oliver began to discourse eloquently on these things, I remember distinctly that the rustling of the leaves of the tables of logarithms would cease, and did not commence again until he got through. It was a very great pity that a man having this exalted enthusiasm for exploration in the higher mathematics should be condemned to waste a large portion of his energy in work which might have been performed by one of small talents. However, it speaks volumes for the patience of Oliver that he remained attached to the Office for a period which must have exceeded fifteen years.

But, while the greater part of Oliver's time was devoted to mathematical and astronomical work, he still found opportunity for exerting himself in other lines. At this time, 1852, he appears as one of the founders of the Young Men's Debating Club, an association that existed through the following seven years. In this, politics, especially the slavery question, received a large share of attention. Mr. Oliver took a leading part in the literary exercises of this society, which included a manuscript journal. To this his frequent contributions gave a character at once original and unique, and for a time he was its editor.

We learn that in 1891 there was a reunion of the survivors of this club in Lynn. Mr. Oliver was present and made the marked address of the gathering. At the request of members it was afterwards printed. It was a well-thought-out presentation of the outlook of humanity in the ethical direction. In this connection I well remember, about the time I first met him, how engrossed a student he was of the writings of John Ruskin.

Caring little for the art theories of this author, he was yet profoundly impressed with his transcendental views of ethics.

In 1867 the Nautical Almanac Office was removed from Cambridge to Washington, and about this time Oliver severed his connection with it. In the autumn of 1868 he went to New York and remained until the following spring. While there it appears he pursued the study of some branches of applied science at the School of Mines of Columbia College. Although he had given up his salaried position in the Nautical Almanac he still made computations for it, working far into the night after spending a pleasant social evening with friends who boarded in the same house, a literary coterie, comprising C. C. Stedmen, R. H. Stoddard, J. M. Hart, Haven Putnam the publisher, Dr. J. Winslow, and others.

In 1869, at the suggestion of his friend and brother-in-law, Pliny Earle Chase, he went to Philadelphia. I remember meeting him at this time at the room of Chauncey Wright in Cambridge. He said he was going to Philadelphia to study chemistry. Of course, we were all regretting that mathematics should lose him. But we hear that he and Pliny Earle Chase studied philosophy and mathematics together and enjoyed themselves greatly at the social gatherings held for discussion and exchange of ideas on Sunday evenings at the house of Professor J. P. Leslie. While in Philadelphia he also engaged in giving private instruction to pupils in the usual English and classical branches, especially in mathematics and physics.

Having returned to Lynn at the end of 1870, in the following spring he gave a course of lectures on thermodynamics at Harvard University. It was his intention to continue these by lectures, to be given in the autumn, on physiological optics; but this plan was frustrated by his acceptance of an assistant professorship of mathematics at Cornell University. Repairing to Ithaca he fulfilled the duties of this station until, on the death of Professor E. W. Evans in 1873, he was made senior professor of mathematics. In this post of duty he spent the remainder of his life.

During the twenty-four years he was connected with Cornell University he appears to have entered into a great variety of work. In the early part of his career there he was under the necessity of giving much time to junior courses in mathematics;

but after 1889 his work was chiefly in post-graduate courses, where he was more in his element. The range of subjects covered by Professor Oliver in his lectures in different years is certainly remarkable: Analytic Geometry, Infinitesimal Calculus, Quaternions, Definite Integrals, Spherical Harmonics, Elliptic Functions, Theory of Probabilities, Theory of Functions, Abelian and Automorphic Functions, Finite Differences, Factorials and Difference Equations, Differential Equations, Non-Euclidean Geometry, Celestial Mechanics, Mathematical Optics, Mathematical Theory of Electricity and Magnetism, Mathematical Pedagogy. It is stated that in the same year he often lectured on as many as seven of these subjects. He would frequently write at the rate of one new lecture a day (skeleton notes, be it understood, sufficient to guide him in the delivery of it).

He was fond of applying mathematics to out-of-the-way subjects. Thus he attempted the illustration of the science of economics by the employment of algebraic formulas. While at Cornell he established a seminarium in economics. Several previous investigators had made a beginning in this line. Professor Oliver's aim was to define the relation between the theory of probabilities and economic laws. The difficulty in the way seems to be the exceeding complexity of the motives which urge men to the carrying out of economic actions, which refuses to be submissive to formulation. It is a like state of things to that which prevents us from predicting the weather as we do astronomical phenomena. One recalls the fate of Poisson's Probability of Judicial Decisions, which the author hoped would be of material assistance to legislators in settling the forms of criminal jurisprudence, but which has remained interesting only as a *tour de force* of scientific speculation.

Professor Oliver would also apply mathematics to physiological and psychological questions. Thus we find him in 1892 writing a paper entitled "A Mathematical View of Free Will." He even would weigh happiness in the scales of mathematics.

But Professor Oliver spent too much time in lecturing; during term time it amounted from fifteen to twenty hours a week. There was left him little time or energy for research outside the class-room. During vacation time he often began some subject for a memoir, but the end of the vacation would arrive before he had finished it, and he must again attend to his classes. By the

next vacation his thoughts had drifted off into new channels. It is much to be regretted that some at least of his lectures were not taken down in shorthand at the time of their delivery by an auditor, as is now so often done in Europe, that we might have had specimens of his methods of treatment of subjects. He appears to have depended much more on verbal illustrations and explanations than the generality of lecturers on mathematics, and consequently his audience were pleased to find they could follow him. All have spoken with admiration of him in this respect. He was addicted to dilating at considerable length on the connections of his subject with cognate branches. He did not think it worth while to bewilder his audience with a great mass of formulas written on the blackboard. Rather than carry the attacked place by assault he preferred to draw his parallels of steady approach by the art of the engineer. His lectures were rather talks about than treatises on the subjects taken in hand.

While at Cornell, in conjunction with Professors Wait and Jones, he wrote and published text-books on algebra and trigonometry. Of the first, the chapter on imaginaries is more especially his work.

We have a few details as to his habits during the earlier years of his connection with the university. He was noted for sitting up late at night, or all night, absorbed in his work, and for forgetting to go for his meals. When he had got fairly plunged into the depths of some investigation he was quite oblivious of the flight of the hours, and he was like a hound which can scarcely be torn from the pursuit of the scent. With him the spirit was everything; the flesh counted almost for nothing. The picture is drawn of him hurrying over the college campus, taking now and then a bite out of a cracker for all breakfast that morning, for lecture time had arrived before he could bestow one thought on the meal. One is reminded of the playful allusion of Plato in the "Phædrus" to the custom of the ancient Athenians of wearing a golden cicada as an emblem of their claim to be *autochthones*: "It is said these insects were men before the discovery of the musical arts. But on the advent of music and the appearance of poetry they were so overcome by the pleasure of this occupation that, singing, they became heedless of food and drink, and thus, quite unawares to themselves, they passed

away." As these habits were seen to be undermining his health, his sister came to Ithaca to put a stop to them. Later, his wife kept him to a more moderate measure of study.

In 1888, after we had long set him down as a confirmed bachelor, he married Miss Sarah T. Van Petten, a teacher of Oswego, who survives him. In the following year, accompanied by Mrs. Oliver, he crossed the Atlantic, with the main purpose of seeing for himself the modes of teaching mathematics followed at the European universities. His stay in Europe amounted to fourteen months; it was passed mainly at the universities of Cambridge and Göttingen. In the earlier part of his mathematical career Professor Oliver had largely devoted himself to modern algebra, created in great measure by Professor Cayley. On his arrival in Cambridge he anticipated great enjoyment from seeing Professor Cayley and hearing him lecture. At this time Professor Cayley was quite feeble, although he was still lecturing. Professor Oliver heard his lectures and had some conversation with him, but felt obliged to curtail the latter for fear of fatiguing him. At Göttingen he found a congenial friend in Professor Klein. In a note written from there he says: "My work here is likely to be of great service to me, including the trains of thought and plans it suggests, no very radically new plans, only as to the spirit, the aims, and the details of my Cornell work."

After Professor Klein returned from the mathematical Congress at Chicago, in 1893, he visited Professor Oliver at Ithaca, and we learn that the two professors, in walking through one of the beautiful ravines which abound in that vicinity, discussed the glimpses given by mathematical studies into the view of the probable immortality of the soul.

Professor Oliver's friends were hoping that he had still before him many years of active life in which he might complete and publish for our gratification some of his numerous investigations, but this hope, taken in the mundane acceptation, was not to be realized. Stricken with a serious illness early in 1895, after battling with it for ten weeks, he succumbed and passed away March 27, 1895, to the great regret of all who knew him, even of those who had the slightest acquaintance with him.

In estimating the importance of Oliver's work in mathematics it must be borne in mind that his published papers are a mere drop from the full bucket. They were thrown off in the hurry

of the moment and seem merely the result of the byplay of his mind. All the efforts of his friends to tie him down to a sustained labor in one direction until rounded completion was reached were unavailing. He seemed to have a constitutional dislike to arranging and writing out in due form the material of a subject he had previously made himself master of; the impulse with him was to press on to something new; he could not delay to paint the fine scene he had witnessed, he could not resist the temptation to see what more might be found in the distance. Stimulus from ambition he could obtain none, for this passion had been left out of his composition; in the matter of procuring fame for himself he was utterly careless. Could he have been induced to write a book worthy of himself he would have done it purely for the gratification of others, heedless whether it brought him any credit. His ardently pursued researches into science seem to have been undertaken from one of two motives, either he loved the thing for its own sake, or he was swayed by a far-fetched philanthropic impulse incomprehensible to the ordinary prosaic mind. Let Plato describe for us the latter motive: "What are the needful sciences? I conceive, those which, having never learned or practiced, one can never become a god or demon or hero for man, of such a quality as to be able to take charge of them with zeal." "When they have light they will share it with one another."

But, although the penning of his thoughts was distasteful to Oliver, he was ready enough to talk about the matters he was conversant with. And how many of them there were. You could scarcely start any scientific or literary subject for discussion in his presence but he appeared as ready and equipped as if it had formed the sole object of his thoughts for years. It seemed that there was no way of explaining this but that he must have had a previous stage of existence, in which he had accumulated this vast store of information, and that in his passage to this life he had been allowed to retain it; but he had the rare faculty of seeing at a glance what are the salient and controlling elements of a subject and could thus dispense with learning the minute details. From one point he divined the lay of the land, while ordinary mortals must traverse it hither and thither in many directions to obtain as exact a conception. He was the Socrates of mathematics, and in de-

parting from Cornell his pupils carried away with them the inspiring influences he had exerted upon them in many lines.

But to describe Oliver as a mathematician and scientist solely would be to miss more than half the man. He seemed to be actuated by two passions; it was impossible to tell which was the more intense. For a time he would be under the influence of one, and then the other came to the front. One, of course, was his passion for the study of mathematics, the other was his passion for the study of ethics. He was a man of wide sympathies and many subjects engaged his attention, but these two were by far the principal, the rest, in comparison, were mere by-play. It is needful here to explain the word "ethics" lest there should be a misapprehension. In fine-spun theories of duty he had only a trifling interest. Such a book as Aristotle's *Nicomachean Ethics* he would have but glanced at, and the formal text-books on the subject were of little aid to him. In this mental dearth he resorted to the poets. He was especially fond of those who have depicted the moods of the spirit. His favorites were Shakespeare, the "In Memoriam" of Tennyson, Robert Browning, and his friend J. G. Whittier. He was no despicable poet himself. When a schoolboy, as often as permitted, his attempts at literary composition were in verse. In later years he occasionally though rarely indulged himself in poetic composition.

Oliver regarded his soul as a stringed musical instrument upon which he was to play. He was always engaged in experimenting upon the tension of its strings, that he might elicit from it a more and more exquisite and ravishing music. His aim was to put it in harmony, closer and still closer, with the music of the spheres:

"Sit, Jessica; look how the floor of heaven
Is thick inlaid with patines of bright gold;
There's not the smallest orb which thou behold'st
But in his motion like an angel sings,
Still quiring to the young-eyed cherubins:
Such harmony is in immortal souls;
But, while this muddy vesture of decay
Doth grossly close us in, we cannot hear it."

It was his delight to be strung to the highest key. He cared nought for his animal existence, but he wanted to climb to the highest plane of intellectual and spiritual life it was possible for

man to reach. This was why he pursued with such avidity ethical studies.

In all this there was not the slightest tinge of religious asceticism or superstition. He had no creed, no set cultus; he could not be assigned to any sect. He was so bent on soaring into the upper regions of the intellect and spirit that he could not bear to be clogged with chains of any sort, not even those of a religious nature, which others take as ballast. He was a man in whom theology is swallowed up of philanthropy and philosophy. He was born in the Society of Friends, but I never saw him in Quaker garb or heard him use the Quaker phraseology or utter a single syllable of theology.

When he had removed to Ithaca and it became known that he was affiliating with the Unitarian Society there, there went abroad among the Quakers of Lynn the faintest whisper, "Oliver has forsaken the faith of his fathers." Faint as the whisper was, it nevertheless after a time reached his ears. Such a remark could not trouble his serenity; but he thought it too bad these good people, for whom he always retained the kindest feelings, should be disturbed by such an impression. He accordingly sat down and wrote a letter, addressed to the society, in which he maintained the fundamental Quaker doctrine of the supremacy of the inner light over all traditional authority. He set forth his views and the leadings of the light within him. He asserted he had not swerved from the path followed by his fathers; that he had simply gone further along it, and that consequently new vistas had opened to him. So great was the pathos and so cogent the logic of this letter that that faint note of detraction was never heard thereafter.

Liberal of an advanced type as Oliver was, he had no tincture of the *odium theologicum*, nothing of the embittered attitude of Salvator Rosa, who said, "If there is anything I take pride in, it is that I despise the church and her priests." He was as ready to find good in Buddhism or Brahminism or Platonism as in Christianity. At Cornell, although reluctant to submit himself to the slightest trammels of organization, he yet so far yielded as to take part in the labors and fellowship of the Unitarian church there. In these he bore a prominent part and conducted the large class in ethics connected with the society and frequented by many young men and women from the university. Here his

luminous treatment of this subject will long be remembered by his auditors.

With Oliver there was no distinction between things sacred and secular. He did not have one code of morals for Sunday and another for the rest of the week. With truth he might have applied to himself the lines of Thoreau, halting, but full of significance :

“ I cannot come nearer to God and Heaven
Than I live to Walden even.”

There are some to whom this seems a worship of the creation in preference to the Creator; but Wisdom is justified of all her children.

The testimony to Professor Oliver's moral and social excellence is uniformly to the same effect, and is couched in such extravagant terms that one is afraid it cannot be believed by those who did not know him; yet I do not think it is at all exaggerated. Suffice it to quote one example from one of Oliver's colleagues at Cornell :

“ He did not accept the orthodox view of Jesus, but I never knew a better, more lovable man than Professor Oliver. And his goodness was so spontaneous. It was the set of his being. He seemed to me to be almost without sin.”

In the southern part of Syria, in a remote antiquity, it was the custom of the people to worship the local or tribal deity in the shade of the groves on the tops of the mountains. A poet of that time and country has described in a few lines his conception of the character of the man who should be permitted to take part in this worship. These lines are remarkable as containing the sum and substance of all that can be set forth regarding rectitude of human conduct; for loftiness of sentiment they have never since been equaled. I quote them because they seem eminently characteristic of our confrère Oliver :

“ Who shall ascend into the mountain of Yahveh?
Who shall stand in his holy place?
He that hath guiltless hands
And a pure heart,
Who hath not wasted his life in folly,
Nor sworn deceitfully to his fellow.
He shall receive blessing from Yahveh,
And help from the god his saviour.
This is the clan of those that seek him,
That seek the face of the god of Jacob.”

NATIONAL ACADEMY OF SCIENCES.

List of the Published Scientific Papers of James Edward Oliver.

- Demonstration of the Pythagorean Proposition: *Math. Monthly*, vol. i, 1858.
- On Mr. Collins' Property of Circulates: *Ibid.*
- Introduction to a Treatise on Determinants: *Ibid.*, vol. iii, 1860.
- Note on Query concerning a Ball held in a Jet of Water: *The Analyst*, vol. i, 1874.
- On the Grouping of Aerolites: Read before the Am. Ass. Adv. Sci., 1869, but not published.
- On the Imperfect Whiteness of Snow: Read before the Am. Ass. Adv. Sci., 1869, but not published.
- Partial Investigation on Best Approximate Representation of Mutual Ratios of k Quantities by those of Simple Integers: *Proc. Am. Acad. of Arts and Sciences*, vol. vi, May 10, 1864.
- On Some Focal Properties of Quadrics: *Ibid.*, vol. vii, November 8, 1865.
- On the Law of Distribution for Certain Plant Numbers: *Proc. Am. Ass. Adv. Sci.*, vol. xxxi, 1882.
- A Method of Finding the Law of Linear Elasticity in a Metal: *Ibid.*
- A Projective Relation among Infinitesimal Elements: *Annals of Math.*, vol. i, 1884.
- A Singular Optical Phenomenon: *Science*, vol. iii, pp. 475, 563, 1884.
- On the General Linear Differential Equation: *Annals of Math.*, vol. iii, 1887.
- Elementary Notes. I. General and Logico-Mathematical Notation: *Ibid.*, vol. iv, 1888.
- Preliminary Paper on Sun's Rotation: Read before Nat. Acad. Sciences in April, 1888.
- Short Notes on the Soaring of Birds: *Science*, January 4, 1889, etc.
- A Mathematical View of the Free-will Question: *Phil. Review*, vol. i, March, 1892.
- Estimates of Distance: *Science*, March 11, 1892.
- Some Difficulties in the Lesage-Thomson Gravitation Theory: *Proc. Am. Ass. Adv. Sci.*, 1892.
- Review of "Mathematical Recreations," by W. W. Rouse Ball: *Bulletin New York Math. Soc.*, November, 1892.