

**MEMOIR OF
DOUGLASS HOUGHTON
FIRST STATE GEOLOGIST OF MICHIGAN**

BY Alvah Bradish, A. M.

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Corresponding Member; Albany Scientific Institute;
Honorary Member; Historical Society of Wisconsin;
Academician and Member of Council of the Chicago
Academy of Design, before the great fire of 1871, and
Professor of the Fine Arts in the University of Michigan,
during the Presidency of Henry P. Tappan,

"Wading the streams by day - tortured by swarms of mosquitoes at night - often short of provisions, and often drenched by rain - were it not that courage is uplifted by the love of science, both for its own sake and the good it is to accomplish, the task of the pioneer explorer would be hard indeed." - Douglass Houghton.

"The life of a man of science belongs to his country and his age."

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PREFACE

THE object of a preface to any publication is to reveal its purpose and to give reasons for its appearance.

It was in the summer of 1834, that the author came to Detroit, Michigan, from Geneva, New York. Letters from the Rev. Henry Dwight, an eminent scholar and banker, introduced him to Charles C. Trowbridge, Henry S. Cole, E. P. Hastings, and other eminent citizens. Dr. Houghton had already established himself in business as physician and surgeon.

Our acquaintance commenced soon after my arrival. This acquaintance ripened into a closer intimacy, and like others of his associates, I was drawn to him by the charm of his manners and by sympathy in his scientific pursuits.

Circumstances of a personal nature have placed in my possession incidents and facts connected with his early boyhood in Fredonia, New York, and in subsequent years I had been led to keep up to some extent a knowledge of progress in scientific studies, and to follow his courageous explorations of the Northwest.

It may be allowed that a person may have a general and appreciative knowledge of Geology, and be familiar with the problems, both solved and unsolved, of this grand science, without being a scientist himself. I do not claim to be such, but I trust it will be found in the volume now offered to the citizens of Michigan and of the Northwest, that I have not wholly failed to appreciate the labors and

achievements of Dr. Houghton, and that the character herein portrayed will be recognized as a faithful one by the few old friends who survive him.

It has seemed important that we should realize the motives that impelled him - the difficulties he encountered, and the services which he rendered to the State. It was not only due to his memory, but it was also due to the gifted men who had been associated with him. It is due to the science that he loved and advanced, and not less to the citizens of Michigan, who watched his progress and stood by him, and who have instructed their Representatives at Lansing, to honor his memory and secure memorials of his person. It is due also to those younger citizens, who have known of Dr. Houghton only by vague reports, or by his name so familiar to their eyes on the map of the State, that his memory should not be a name only, but a heritage to be appreciated and enjoyed down to the latest generation.

I should have been well pleased if some one more competent than myself could have gathered these materials, arranged and traced his career from his earliest school-boy life, in a way to have explained his studies and labors and illustrated his character.

I cannot omit to mention in this connection, my obligation to Hon. Bela Hubbard, whose brief memoir of Dr. Houghton, published in the "Journal of Science" in 1847, and whose intimate personal acquaintance with its subject, have proved of valuable aid to me, in the preparation of this larger work.

In the meantime, materials and reminiscences, though still meagre, *(sic)* have been gathered, until by insensible degrees they have assumed an importance that would seem to justify this attempt to arrange them for publication, and to present to the public a connected narrative of his brilliant career.

The close intimacy of the author with Dr. Houghton - with his father, mother and brothers - would naturally furnish information that could be derived from no other sources.

I am also persuaded that a reprint of his Geological Reports, or a portion of them, will be deemed a welcome contribution to scientific literature - not alone from their intrinsic merits, but from their being to some extent a record of the labors of these earlier Geologists of the State. It should be remarked that these reports are now so entirely out of print, that it is doubtful if a complete copy can be found in the public libraries at Detroit, at Lansing, or at Ann Arbor.

In the Appendix will be found a summary of such reports as it is thought not advisable to include in full; also a general statement of the works that have been published since the death of Dr. Houghton, pertaining to the Geology of Michigan. It is believed that this portion of the volume will be especially acceptable to all intelligent readers who wish to be informed of what has been accomplished by the pioneers of the Geological Survey of the State.

The full-length portrait of Dr. Houghton - of which the frontispiece will give some idea - has awakened such a wide spread interest in the State, and the petitions for its purchase have been so numerous and urgent, that it is thought only just to his memory to include in the appendix, a few of these testimonials to the very great excellence of the memorial portrait, coming as they do from the highest authority in the State of Michigan.

After no little hesitation, it has seemed to me that I could not well ignore the suggestions and demands of a plain duty. What I have said must serve to interpret the motives and explain the appearance of this volume.

It may be stated that these Memoirs are intended for the unscientific as well as for the learned, and for all readers who can sympathize with the labors and achievements of the pioneer geologists of Michigan.

Experts in the natural sciences will no doubt find in this volume mistakes and short comings; but as the author had not been trained in any special school of science, he begs that his readers who have been more fortunate will exercise a liberal and magnanimous spirit towards these memorials of Douglass Houghton.

ALVAH BRADISH

"If I have awakened anyone here and there to think seriously of the complexity, the antiquity, the grandeur, the true poetry of the things around them - even the stones beneath the feet, if I shall have suggested to them the solemn thoughts that all these things, and they themselves still more are ordered by laws utterly independent of man's will about them, man's belief in them; if I shall at all have helped to open their eyes that they may see, and their ears that they may hear the great book that is free to all alike, to the peasant and peer; to men of business as to men of science, even that great book of nature, which, as Lord Bacon, says: 'of old the word of God revealed in facts' then I shall have fresh reason for loving the science of geology, which has been my favorite study since I was a boy."

- Rev. Charles Kingsley.

"A physical fact is as sacred as a moral principle - Our own nature demands from us their double allegiance."

- L. Agassiz.

This is an abridged, reformatted version of Alva Bradish's 1889 Memoir. It contains just the first parts about his brother-in-law Douglass Houghton. Original page numbers are indicated where they would appear in text as {{ ## }}. Text has been scanned and converted to a Word document, then converted to the distribution PDF. Even with review, errors will survive.

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CHAPTER I

Houghton Ancestry - Judge Houghton - Parentage - Boyhood - Family - Education - Invitation to Detroit

The American branch of the Houghton family was settled in the town of Bolton, Mass., near Boston. The ancestors of Jacob Houghton, the father of the subject of this memoir, came over from England about the year 1658. Bolton, Lancaster, in England, has been the home of this family from the time of the conquest. The name was spelled De'Houton; it was a Norman race. The old castle or tower of Houton, a plain venerable structure, still stands, and has been until recently, occupied by the present representative of the family.

Mr. Houghton, of Fredonia, was a lawyer by profession; a gentleman of culture and acquainted with books. He had kept up some correspondence with his namesake in England, and he would very naturally feel some interest in the records and traditions of his early ancestors. If he felt some pride in keeping alive this sentiment, it was at least without ostentation; for this pride - if we must give it a name of reputable connections - was never obtruded on others. {{ 2 }} With him it was an amiable sentiment, not a passion, and it would be a misapprehension of his character to suppose he entertained any special reverence for titles unless they were deserved, and had been won by great and heroic deeds. This feeling of reverence for olden times and old country ways, was, however, a deep sentiment, though in no way offensive. In all his intercourse with neighbors, socially and in business, of all men that I have ever known, Judge Houghton was the most free from all assumption or arrogance; the most frank, guileless and even childlike. He was a great favorite with young people,* the girls delighted to have him as an escort or a companion. The children loved him. Mr. Houghton was thoughtful for the welfare of his neighbors; very tender and delicate in bestowing favors on his friends and on the needy. His reverence for woman was great; it had the flavor of the old days of chivalry, without its extravagance. It was deep, pure and artless. In money matters he was too liberal, and he gave friends his time and his counsel. His memory was singularly retentive, and he would entertain with anecdotes and narratives. The hospitalities of his house were cordial and without stint; and it would be only the want of ample means that should prevent him from following more closely the example of some of the old titled barons of the Houghton family in England. For some years Mr. Houghton had kept up some correspondence with the head of the family in England; Sir Henry had sent him his portrait, and this has long hung in the parlor of the old Houghton mansion in Fredonia. It is a cabinet sized, engraved, half - length, seated portrait. The countenance is one of much benevolence, - a type of the {{ 3 }} independent country gentleman of England, not unaccustomed to fox hunting in his younger days, a staunch lover of king and church, not over abstemious of wine, and not unacquainted with touches of the gout.

A few years since there had been a rumor widely spread through New England and other States, that a large fortune had been left in some way to the American branch of this family, now only waiting for the claimants to come forward and receive their own. A meeting of Relatives was held in Boston to take the necessary measures to secure this treasure. They organized for this purpose, and raised funds to meet expenses. A Mr. Rice, a young lawyer, had married a Houghton, and he was deputed to carry out the wishes of the society. It was soon discovered that Judge Jacob Houghton, of Fredonia, New York, was the only one of this name who was acquainted with the older branch in England, and must be considered very naturally as the head of the family in this country. Mr. Rice, the young attorney, made a visit to Fredonia, full of this promising enterprise, - but Judge Houghton placed little confidence in the existence of any such fund in England. He was too good a lawyer to be carried away with any such plausible rumor. He declined to subscribe to the association, but he gave Mr. Rice a cordial letter of introduction to the head of the house in England - now the present Sir Henry Rold Houghton, and member of parliament. This secured to Mr. Rice a courteous reception, though it is not to be presumed that he revealed the object of his visit but after examining the records carefully in London, he satisfied himself that no such fortune could be found. In the meantime, during his stay, he accepted the hospitalities {{ 4 }} extended to him by the Member of Parliament, to whom his letter was addressed. The reader will readily recall similar rumors as to other American families of English origin, who it had been supposed would be made rich by these long unclaimed fortunes. A pleasing result of this Houghton organization and Mr. Rice's mission - especially pleasing to the Fredonia branch of the family - was a superb gold snuff box sent through Mr. Rice to Judge Houghton, as a gift from his Relative and namesake, Sir Henry Rold Houghton. The old fable of the division of the oyster among disputants, and its shell, came as a natural suggestion, perhaps, to the members of the association; but no one, bearing the name of Houghton in America, would doubt for a moment that the precious memorial gift had gone into the right hands.

Judge Houghton had married early in life a lady of New London, Connecticut, - a Miss Mary Lydia Douglass - who survived her husband eight years and died at the old residence in Fredonia, in 1875, at the great age of ninety - two, retaining her faculties to the last moment of life. Her parents lived in New London during the war of the revolution, and she remembered well the burning of the city by Benedict Arnold, then in command of an English marauding flotilla, when she, with father and mother, fled into the country for safety.

This Jacob Houghton, came to Fredonia, New York, in 1812. He came with his young family when Chautauqua County embraced a large extent of country, and all that region was a wilderness. The journey from Troy to this remote region was performed by horse teams, a distance of about four hundred miles, and Rochester, a small village, was the {{ 5 }} frontier town, still in the wilderness looking west from the Hudson. His family were several weeks on their journey

before they reached their destination - a long tedious journey, not free from peril and suffering. But these hardships were encountered with resolution and a firm purpose. They were young, not easily discouraged, virtually, it was the beginning of a new life with them, and they were animated with a noble passion for securing a home in the new region of the west for themselves and their children.

They would be surrounded by almost an unbroken wilderness; it would be a long period before they could be reached by the comforts and amenities of eastern life. Mr. Houghton had been a student at law and was already admitted to practice at the bar. He immediately opened his office in Fredonia, a rude structure no doubt. It was in the midst of the woods, noble chestnut and oak trees, maple and white - wood, surrounded him on all sides. The village as yet did not exist, save a few rude cottages. But the services of a lawyer were soon in demand, and it was not long ere his practice became extensive and he was able, very early, to begin building a home for his family. This was a two-story frame house, with ample room for his growing family, his library and his law office. It was no doubt the best and most imposing private residence that had been built west of Rochester. From time to time through these early years Mr. Houghton had been solicited to occupy such offices as were in the gift of his fellow citizens. He was appointed one of the judges of the County, was elected justice of the peace, and was at one time postmaster. But in truth he had no love for the trammels of office, and would shrink from all those usual arts of the {{ 6 }} politician to secure favor. He loved his independence, nor could he afford to sacrifice his law business for the small compensation and loss of time incident to holding office in a small village still in the woods, and in a County hardly organized. Very early he was admitted to practice in the higher courts of the State. In subsequent years many of the leading lawyers of that part of the State, became students in the office of Judge Houghton. Among those will be remembered the names of Chauncy Tucker, Hanson Risley, Cutler, Brown, Hazelton, and James Mullet; and others well known, and some eminent members of the bar, of western New York.

Mr. Houghton's reputation for ability in his profession, for scrupulous attention to the interests of clients, for sound advice and probity of conduct was not excelled by any man, either in the profession of the law or in any other calling. These qualities gave him a large practice, which might, or might not lead to fortune. Judge Houghton was of a companionable temper; he would never deny himself to those who needed help. His yielding nature sympathized with the hardships of new settlers and laborers, who were making homes in the wilderness around him. These sought his counsel and his aid. If his law practice was large, his good nature and benevolence kept pace with his business, and often went in advance.

If a new country like that now being settled in Chautauqua County offered great opportunities for shrewd men to accumulate property, as it undoubtedly did, so the deprivation to which the poor are exposed is a perpetual

appeal to the better feelings of the kind and benevolent spirits who are able to give their assistance. Both Judge Houghton and his wife {{ 7 }} were widely known for unobtrusive charities, for thoughtful care of the sick and poor, far and near. But it must be admitted that this spirit was not the spirit of money making. Such a talent Jacob Houghton did not possess. He had, to be sure, all the application and the ability that might be essential to success, but while his professional business was large, this show of success would be rather seen on his ledger than on his bank account; for it was too true if the debt of a client was on his books for one hundred dollars, and the client in the meantime should be in need, Judge Houghton would lend him fifty dollars and forgive him the balance.

Mr. Houghton was a great lover of books, his reading had been extensive, especially in English and early American history. His library was well supplied with such works, and it was rare that a day would pass without a reference to this storehouse of ideas. This love for solid reading was imbibed by his children and this passion for learning, thus early inculcated has been a marked trait through life of all members of his family. These circumstances and conditions of the family of Houghton, have been, perhaps, rather unduly dwelt on; but it seemed rather called for to enable us to realize the influences that surrounded the childhood and earliest days of Douglass Houghton, the subject of this memoir. The development of young Douglass's mental powers and his studies was greatly influenced by the character of his parents, as well as by the peculiar circumstances of place and opportunity. It should be observed that Mrs. Houghton not only sympathized warmly in the studies and advancement of her children, but like other noble mothers was ready at all times to make every sacrifice that would be necessary to their education. {{ 8 }}

The family now was a large one, five sons and two daughters. The highest ambition of the father was a thorough education for his children. It is true, this desire for culture, would, no doubt, interfere somewhat with that early discipline and initiation into business of a more practical kind - farming or trade - that a new, wild country would seem to demand. Even the limited means of the family would seem rather to suggest some trade or pursuit that would bring quick returns. In fact, it is usually difficult to restrain boys from entering on a career of business long before they have mastered even the rudiments of education.

But the Houghton boys sympathized with the ambition of their parents, and their studies began very early in life. It may be said the first passion of these brothers was for distinction in scholarship. Alured, the eldest, pursued his studies at the new college at Meadville, Penn., then just opened for the reception of students. His collegiate course was completed at Geneva, New York.

Mr. Horace Webster, Prof. of mathematics at Geneva, has said to the writer that Alured Houghton was an accomplished scholar, already deeply read in the classics, and that his future eminence was certain if he had lived. At this date, Alured Houghton, the oldest of the family, as will

be seen by the following letters, was at college, Meadville, Pa. He was eleven years old, and his younger brother Douglass, the subject of our memoir, was nine years old. We insert these few letters to show to the curious reader the spirit that prevailed among the members of the Houghton family - it is not often that boys are studying Latin and Greek at college at the age of eleven years, or that they write letters in these languages to {{ 9 }} brothers of nine years. Douglass Houghton was born September 21, 1809; he was the fourth child born to his parents; he was feeble in body and diminutive in size. His mother has said she had fears that she could not raise him. But his intellect was sound and bright, quick in apprehension, of a joyous nature, sympathetic and sensitive. As he grew to boyhood his strength and health were assured; he was no recluse or dreamer in boyhood. He mixed readily and heartily with those of his age, and was distinguished for bold enterprise among his companions at the age of six years. But for close intimacy he was singularly fastidious; not every boy that trained with him would secure his confidence. He seemed to have at this early period that instinctive estimate of character that ever distinguished him through life. His figure, even for a boy, was small, but it was instinct with nerve and activity. In temper he was quick and resolute, a little obstinate, perhaps; his decisions were prompt, like those of a commander, and his boyish plans were matured without much consulting others. In 1824 the Fredonia Academy was organized and established. Douglass, with his younger brother Richard, were among its earlier pupils. He had now at home for his companions his two sisters Lydia and Sarah, and his brothers Alexander and Richard. Jacob, the youngest of the family, was not old enough to join in these studies. Alured, the eldest, had completed his studies at Geneva College and had been called to Baton Rouge, Louisiana, to take charge of an academy which had been recently opened there. Soon after his arrival there he was taken sick and fell a victim to the fever that prevailed. The death of this son who had been admirably educated, and whose life with every bright prospect, had, as it {{ 10 }} were just commenced - that is the life of manhood - was a severe blow to his parents, a profound sorrow to all members of his family.

After the lapse of so many years, we must not expect to recover many traits or incidents of the early boyhood career of Douglass Houghton. All his faculties were developed early; in the midst of play he was a student, not always, perhaps, according to academy rules; no doubt he often vexed his teachers. In truth the traditions of the old Academy at Fredonia tell us of sundry pranks and exploits not laid down in the list of allowable pastimes. Sometimes it would be a pumpkin mask, lit up with a candle to frighten obnoxious students; again he would be leading his trained company of boys around the academy halls, uttering groans to disturb the school or to express disapproval of the master's discipline. Such outbursts of temper are not very serious and they do not last. They come less from any vicious traits of character than from the buoyant outflow of spirits and that irrepressible disposition of the young to do something heroic. Douglass had ways of his own to master his lessons and gain time for

other studies not connected with the academy course. The eldest brother, as has been mentioned, was at college at an age that might appear premature, as he was already a good Latin and Greek scholar. Alexander had mastered his Latin and Greek and had shown all through life a strong taste for classical literature. Rich and of a gentle and amiable nature, beloved of his sisters with more than usual affection, was strongly inclined to scholarship. Soon after Douglass settled in Detroit, Richard commenced his studies as a medical student in his office. But during the season of the cholera of {{ 11 }} 1834, Richard, who was of a delicate constitution, fell a victim to its ravages.

Douglass, not behindhand in the usual studies of the new academy, and sufficiently skilled in Latin, showed a strong bent towards the natural sciences. It will soon be seen how strong was this tendency of his mind, and how admirably fitted he was to grapple with these subjects and to master them.

The Houghton homestead that had been built or finished in 1813, continued to be the home of this family; it was in fact a home and school house, the academy and college, for these brothers and sisters. They were indeed more than usually united by natural affections, by a community of studies and by a profound love of parents and home. An orchard, still in bearing, (1888) was planted early; it extends some rods on the slope back of the house and embraces two or three acres. A row of noble locust trees extends along the whole front of the premises for four or five hundred feet. These were brought from Mayville, as slender cuttings that Judge Houghton secured within the leg of his boot, traversing the woods on horseback. The Houghton house occupies the highest ground in the vicinity of Fredonia, overlooking the beautiful village embosomed among trees. At the west and north the eye takes in a stretch of farm land that slopes gently to Lake Erie; the lake itself is seen through copse and over groups of the elm and sycamore. The Ganadaway stream of considerable volume traverses the village. From the house it is seen at the foot of the hill; its beautiful and rapid waters sparkle as they find their way between high banks and through open glades to the lake, two miles distant, while on the south {{ 12 }} the hills of Chautauqua, rising into elevations of from six to eight hundred feet, yield the scenery that is often bold and always picturesque; and these trending to the west, skirting the lake shore, offer to the eye a noble range, softened by the haze or purple of distance, and diversified by cultivated farms, by orchards and vineyards, by embossed dells, by groves and by virgin forests.

A few rods from the house, just back of the orchard where the ground slopes suddenly, the boys had excavated a room or cellar in the bank, and this, with a roof extending over the doorway and covered with turf, gave the Houghton boys a study large enough to admit three or four persons. This primitive school room was devoted exclusively to hard study; no play, no cards or amusement of any kind were permitted here. It was a sort of close communion troglodyte college. It was here that these earnest students would retreat to master all their severe studies without interruption; it was here, as much as in the academy, that

they perfected that self discipline which prepared them for their after career in life. None of the boys of the village, rarely even their companions in school, were ever admitted here, none but the two sisters, whose studies received the aid that loving brothers could give. It may be considered by some that such slight incidents as these should hardly be deemed important, but it must be remembered how much these earlier habits enable us to see the influences that strengthen character and give the assurance of success in life's struggles. The writer of this memoir remembers well visiting this rustic study of the Houghton boys as early as 1838. It was then, somewhat dilapidated, but still sufficiently intact to admit a visitor and to show him the {{ 13 }} seats and crude shelves that were wont to accommodate these youthful Greeks. Since that period the scythe and plow, time and the elements, have leveled the slope and obliterated all traces of this rustic sanctum of Douglass Houghton.

At a very youthful period Douglass had been recommended as a candidate to the Van Renssaeler scientific school at Troy, New York. This polytechnic school was founded by the Patron Van Renssaeler, and at this time was under the charge of Prof. Eaton, so well known as a distinguished educator. Here Douglass graduated and received his diploma of Bachelor of Arts, in 1828. Within a few months after this well earned honor he accepted the appointment of assistant professor in the branches of chemistry and natural history in this same institution, conferred on him by Prof. Eaton. At this time he was nineteen years old. In 1830 some friends of science in Detroit, including such men as Gen. Cass, then Governor of the Territory of Michigan, Maj. John Riddle, Col. Henry Whiting, E. P. Hastings, Shubal Conant, Rev. Dr. Berry, and others, applied to Prof. Eaton to recommend to them a person to deliver a course of public lectures on the sciences of chemistry, botany and geology. The Hon. Lucius Lyon, then a delegate in Congress from the Territory of Michigan, on his return from Washington, called on Prof. Eaton at Troy, as the leading scientific educator in this country, to make the proper inquiries; for it should be remembered that lecturers were not so easily found then as at present, nor was it an easy or inexpensive experiment to traverse new states by stage for this purpose. Professor Eaton listened to Mr. Lyon's request, then arose, opened the door of the little laboratory adjoining, and calling him by his familiar name of Douglass, introduced the {{ 14 }} young philosopher to the member of congress; - for he was but a boy in appearance, as indeed almost so in age. Mr. Lyon, a gentleman reserved in manner and of much dignity, was not a little surprised at such a presentation. He could hardly believe Prof. Eaton to be in earnest. Could he propose to send a mere pupil, a boy student, still in his teens, to discourse on subjects of science, and to address men of mature culture, conversant with the great outlines of the natural sciences, for such as these he would certainly encounter in Detroit?

But Mr. Lyon was soon convinced that young Houghton was competent to fill such a mission; nor did the youthful professor hesitate for a moment. Prof. Eaton had implicit confidence in his ability to acquit himself with credit and

honor, and while retaining his professorship in the Van Renssaeler institute, at the special request of his friend, he gathered up his simple apparatus to serve for illustration and experiment, visited his parents for a few days at Fredonia, then departed by stage and boat for that small but ancient settlement on the Detroit river - that future city of the straits and beautiful metropolis of a great and wealthy State. At that time it was known only as an old French town, a border military post touching the Indian country. Houghton brought letters to several prominent citizens, and warmed by the prospect of success, confident in his knowledge and capacity, with these lectures and thus invited, commenced the career of Douglass Houghton in the State of his adoption. {{ 15 }}

CHAPTER II

Success in Detroit - Professional Career in Michigan - Schoolcraft Expedition - Scientific Pursuits - Inception of a Natural History Survey of Michigan - State Legislators and Geology - Diplomacy

Douglass Houghton's subsequent advancement to positions of trust, honor and responsibility was a matter of pride to the citizens of Detroit, for they had assurance that every office he should occupy would be raised and honored by his genius and integrity. Even before leaving Fredonia for the institute at Troy, before he was seventeen years old, he had found the time to study medicine under the direction of his father's friend, Dr. White, and was admitted to practice by the medical society of Chautauqua County, in the spring of 1831.

No man who has ever entered into business or in a professional career in the State of Michigan so speedily won to himself such a body of able, enthusiastic friends as Douglass Houghton. These friends were not confined to the city of Detroit, where the charm of a daily intercourse might to some extent account for this popularity; they could be counted by scores all through the State. Even now, after a lapse of more than forty years since his death, his memory is cherished with enthusiasm, mingled with a tenderness that {{ 16 }} can only be explained by those who were intimate with the man. A stranger looking over the map of Michigan will observe that a township, a County, a lake, a city, each bears the name of Houghton; one of the union free schools of Detroit carries this name, and his labors and gifts at Ann Arbor make it certain that the honored name of Houghton will long be cherished at the seat of the University.

It seems due the memory of such a man that we inquire into the cause and origin of these unusual honors and homage bestowed on one so young, at first without friends and without money. The leading men of Michigan now were boys, or were unborn, when the name of Houghton was the most familiar name spoken in all her borders. The generation that knew Douglass Houghton is rapidly passing away, but his name should not pass out of the memory of men. Houghton's life was a brief one, but it was full of purpose and activity, of energy and achievement. We will

try to gather the records of his labors, his intercourse with public men, his explorations and discoveries; and these will reveal to us the secret of his power and will illustrate the rare traits of his character.

When he landed in Detroit his resources were but slight; but he had courage, and that indomitable energy which insures success. He was struggling, indeed, to earn the means to carry on his studies and lectures. He was not yet twenty years old, a total stranger save through the letters that made him known. To be sure, he had money left in his wallet - it was just one dime! He commenced his lectures in the old Council House on Jefferson Avenue. His enthusiasm, the thorough knowledge of his subject, the precision of his {{ 17 }} thoughts, the artless manner of the young scientist, carried his audience with him, and soon rendered larger rooms necessary. His talents secured the confidence of the leading men of the city and brought friends. These friends stood by him; his success as a lecturer was assured. And though impediments might for a moment discourage him, they were but slight, for he speedily triumphed over all. These new scenes, the friends he made, these lectures, the crowd that pressed in to secure seats, are all modestly related in filial letters to his parents. It was only a few months after his arrival in Detroit that he received the appointment of surgeon and botanist to the expedition for the discovery of the sources of the Mississippi, organized under the direction of Henry R. Schoolcraft, whose distinguished career was then just opening, and whose subsequent labors have conferred honor on his country. The Hon. Bela Hubbard, so well known in this state, and long attached to the Geological Survey of Michigan, as Assistant Geologist, says that "Houghton's report on the botany of that then remote and unexplored region displayed not only an extensive acquaintance with that science, but his researches did much to extend our knowledge of the flora of the Northwest." When we consider that at this time he had hardly reached his majority, it is impossible to withhold our admiration of that firmness of temper and that vigor of genius that enabled him to achieve success so early. From 1832 to 1836 he practiced as physician and surgeon in Detroit; he united also the skill of a dentist, in which he was considered an adept. But in the midst of an extensive practice he never relaxed his studies in natural science. (2) {{ 18 }} It is to the credit of the citizens of Detroit, and should be remembered, that Dr. Houghton was not only welcomed with confidence and with open hearts, but he was warmly and efficiently sustained. The friends he made, he never lost, and these were among the best men of the state, and not a few of historical interest. Here were Governor Cass, Dr. Zina Pitcher, Lucius Lyon, Judge Campbell, father of the present Chief Justice, C. C. Trowbridge, Dr. Rice, the two Hubbards - Henry and Bela - Chancellor Farnsworth, Henry S. Cole, Edmund Brush, Col. Whiting, John Owen, and a little later Stephens T. Mason, the youthful and gifted Governor of the State. These, with many others, were warm, stable friends of young Houghton.

It was in the summer of 1834 that the writer of this memoir first formed his acquaintance. During that season, when the cholera visited Detroit with such fearful and fatal results, no one could be more devoted or make greater sacrifices to solace the sick and dying than young Houghton; and it is known that in the perilous exercise of his profession, in the midst of suffering and panic, amid the appalling progress of a mysterious and terrific scourge, he stood firm and self-possessed. Much of these labors would be gratuitous. He hastened to the bedside of the poor and deserted, as well as to the rich, and like others of his profession thought only of duty and humanity. If not always in money, the reward would come, the most acceptable to a true physician, the grateful remembrance of those who had recovered under his faithful attendance.

There are certain tendencies to special pursuits, which if we could always trace to their origin, would explain why one {{ 19 }} man has devoted his life to law, another to theology, one to science and one to art. In some families this diversity of pursuit is as great as though there had been no common influences acting at once on all members of the same family. No doubt the cause of this diversity of development would be found if we were able to carry our investigations far back into the first impressions of childhood. While the boy Houghton was a student in the Fredonia academy from its foundation, yet long before his serious studies here, the common school had offered its advantages; and his mind had received the loving discipline of a home culture. A few hours of the day served for the mastery of his lesson, the balance might find him boating down the Canadaway Creek, or setting traps for the muskrat; or while threading streams on fishing excursions, or hunting in the neighboring woods for the black squirrel, his taste for natural science would be nourished. Every bird he shot, every chipmunk he brought down from its hiding place, the spotted trout from the hill streams, the wild flowers, the stately tulip trees with their imperial blossoms, the rocks that cropped out from the sides of gorges - each and all of these were his teachers. They offered lessons pregnant with meaning to a mind so quick, so curious and so independent.

After he entered the academy he showed some aversion to classical studies - especially to Latin, and perhaps in a less degree, to arithmetic. We can see causes for this, and may remember what new and improved methods attract and beguile the reluctant student in these unsavory studies. An eminent English author, himself an Oxford man, has said "That any one who has passed through the regular graduation of a classical education and is not made a fool of by it, {{ 20 }} may consider himself as having had a very narrow escape;" while on the contrary, Sir Walter Scott has remarked, that he would have given half his fame could he have been well grounded in the Latin language! We must not give too much weight to the opinions of those who feel that they have lost time in classical studies. The knowledge they bring is very precious. We would sympathize more cordially with McCauley's words, expressing his disgust and horror of mathematics. Douglass's rather never relaxed his interest in the thorough education of his children. His

reverence for scholarship was great; he was indulgent in most matters affecting his boys, but he desired them to be faithful and earnest in all their studies in the academy. But indeed, Douglass seemed to have lost his interest in the study of Latin, which gave his rather much uneasiness. A friend of the family, Dr. Walworth, a gentleman of liberal education, advised Mr. Houghton to have his son drop these classical studies for the present, and to allow Douglass to pursue botany and other kindred sciences, to which he seemed strongly inclined. This judicious advice was accepted, and no doubt the after career of young Houghton was shaped in no inconsiderable degree by these well timed and friendly suggestions. With his ardent temperament, he will be found within a few brief years, ready to aid in every liberal enterprise that appeals to him in the growing city of his adoption. He had quick sympathies and a clear judgment. The Young Men's Literary Society of Detroit, was organized in 1832; he was elected its first vice-president. He would be among the active teachers of the Sunday school of the church in which he was nurtured. {{ 21 }}

But as it has been seen, long before he came to Detroit, before he had been appointed assistant professor in the institute at Troy, while yet in Fredonia, his mind had been strongly bent toward the natural sciences. A remarkable phenomenon near the homestead awakened his inquisitive spirit. Even at the age of ten years, he was attracted by the presence of a gas observed to rise spontaneously in the bed of the Canadaway Creek; older men, of course, were not ignorant of this; - long before the white man had penetrated these forests, the Indians had noticed its presence. But the boy Houghton began to investigate it. Mr. Hanson Riley informs the writer that he remembers Douglass Houghton gathering the light fluid in a bottle, and afterwards setting fire to it, - and Mrs. Riley recalled, when a girl at school, being alarmed one day by the rumor that Douglass, in some wanton freak, threatened to burn up the Canadaway stream, and she and her companions hastened to get out of the way!

His mother, living to the great age of ninety-two, has told the writer, that Douglass, one day, brought up to the house some gas in his hat, and there lit it in her presence to convince her that it was a burning fluid. He thus commenced his philosophical investigations while a student; almost a school boy and before he entered the academy. Even at this early day he was looking into the mystery of the things about him. In the boy we see the man. His mind would be analytic; too bold and active to feel at ease in the pursuit of classical studies. Even mathematics would have but a partial hold on him, except as they might promote the more practical investigations of science. He was the observer of nature thus early and throughout his brief life. Not so much the {{ 22 }} artist, who studies the harmonies of color, and the significance of form and expression, as the naturalist or chemist, who seeing changes going on in nature, is compelled to investigate the causes of such changes, or the means by which they may be reproduced. His younger brother, Richard, constructed an orrery to aid the classes in astronomy, and this was long

used in the academy. Douglass, in the meantime, grappled with the subject of electricity, and the garret of the old Houghton house may still offer evidences of these labors in the form of sundry jars, glass tubes and circles, by which the young philosopher tried his hand at these nice manipulations. He repeated the experiment of the Italian savant on a frog, with success. The family dog, old Prince, so called, was often aroused from his day's slumber by an electric spark cautiously applied to his nose. It must have been as early as 1825 or 1826, when Douglass engaged in the enterprise of making an explosive powder, for we still have to notice his active energies before leaving Fredonia for Troy.

A young man, a school companion, by the name of Wm. Hart, discovered, jointly with Houghton perhaps, a method of making a coarse grained powder, to be used on the pan-lock of the gun - the cap had not then been invented. Hart would need a chemist and a knowledge of detail, which he did not possess himself. These boys entered into a sort of partnership, Houghton furnishing his portion of brains and purpose, with some money. Just back of the orchard on the Houghton premises, some twenty rods from the house, is a branch of the Canadaway Creek that, crossing the field through a gorge, and falling from a ledge of rocks five or six feet in height, gives a water power of considerable force. The quick eye of young {{ 23 }} Houghton saw that he could obtain the power necessary to carry on his machinery, and very soon the young philosopher was seen busy fitting up suitable structures to receive the various materials and the apparatus necessary to carry on the enterprise of manufacturing powder. We do not know how long these labors were continued, but not long, perhaps a year. It was not without some success, as the powder was offered and sold readily in a limited market. But for some reason that cannot be known now, it did not prove profitable. At all events the powder mill met with a sudden and disastrous termination. Douglass Houghton was alone in the mill at this time; he was carrying a pan of powder from one room to another; in passing a stove perhaps, a spark, it is thought, fell on the contents of the pan, which instantly exploded; the shock threw Douglass through the door, a sudden rebound carried him back again, prostrating him to the floor. He rose to his feet, not realizing for the moment the amount or the nature of the injuries he had received. He had the presence of mind to close the door, and plunging his head and arms into the floom to subdue the pain he suffered; then with dimmed vision, and ignorant as yet of the extent of the disaster, he made his darkened way through the orchard to the house. His mother has described his appearance on that fearful occasion. We do not know, he hardly knew, how he reached the house. His face was blackened with powder, his hair was nearly burnt off his eyebrows singed, the skin of his face, hands and arms burnt and crisped, but he staggered to the arms of his mother bewildered with suffering. A beautiful instance of his tenderness even in this dark moment shall be mentioned here. On first reaching the well {{ 24 }} he attempted to draw water to render his appearance to his mother less shocking; but at this moment she first caught a glimpse of him, hardly knowing her own son. "Don't be

alarmed, dear mother; I am not much hurt." These were his first words. His mother describes him to the writer as the most dreadful sight she ever beheld. In a few hours he was totally blind. It was long before he recovered from these injuries. But the vigor of youth, the faithful attention of his father's friend, Dr. Walworth, with those tender cares that come from a mother's love, ere long restored the youthful philosopher to health and vision.

The science of botany had early engaged his attention. Geology, less attractive to the young, soon divided his interest, and these studies became a passion with him. He could not pick up a pebble but his mind would dispose of its geological relations or its mineral qualities.

In crossing a fence you might see him seize the shield or cocoon of a moth, hidden to ordinary eyes, place it carefully in his pocket, and on his return to the house put it in a safe place where he could detect its final exit. But he was never a mere collector of specimens, an amateur in science. He would master the principles that must underlie all scientific studies. He was a great reader, and before he became so absorbed by his various duties in Michigan, he had found the time to read history, especially English and American. The example of his father had quickened his taste. A friend and companion, Judge Samuel Douglass, tells the writer that while young Houghton was recovering from the powder explosion, and after he could use his eyes with safety, he beguiled his time in reading Homer's Iliad. But his reading *{{ 25 }}* outside of special science could not be extensive. He had not the time for the cultivation of a literary taste, and no time would in the future offer to him the leisure for these more elegant studies, such as had won and distinguished his older brother Alured. But he loved music, and often beguiled a few moments by taking his flute. Indeed he performed on this instrument with great taste and feeling. He would leave the drudgery of office labors now and then, come up stairs to the parlor, and join his sisters in a brief concert.

His memory was tenacious, what he read he retained, and this not in a loose, desultory way. Even after his professional and scientific studies had entirely absorbed every hour of the day, he would still find a moment to indulge in this earlier taste. A new history or biography would arrest his attention. It is remembered when Botta's excellent history of the United States first appeared, the Doctor could hardly lay down the volume till its pages were, devoured.

He had an excellent judgment and a taste for didactic and epic poetry, and would select the best reading for his sisters. He had read the Iliad of Homer, and Virgil was not a stranger to him.

But all these studies and indulgences must now be postponed. Already the professional demands on his time, and the scheme of the Geological Survey of the State were occupying all his powers and filling that active brain with plans for its achievement.

It was in the year 1837 that Dr. Houghton matured the scheme of the Geological Survey of the State of Michigan.

There were few, if any persons in the State at that period whose acquirements fitted them to give council even in a plan *{{ 26 }}* of this nature, and in consequence the labor and responsibility of projecting and maturing such a survey would devolve almost wholly on him. Since that time so many Geological Surveys of States have been organized that such a labor would now be greatly lessened. But Dr. Houghton had no example or model applicable to the state of Michigan to guide him. He proposed to himself a system that should comprise four departments or divisions, geology, zoology, botany and topography, each having its official head, and all united under the general guidance of the State Geologist

It would be necessary that this plan should be brought before the Legislature, and it must be approved by that body. The members of the Legislature were assuredly not familiar with the facts or the value of geology, in any sense, either as an economic or as a theoretic science. The departments of zoology and botany might appear to them even of very little practical or public importance. Michigan had just entered into the great family of States; she was as yet inexperienced in public works of all kinds. She was poor, her people were sparsely scattered over a wide field of dense forests, prairies or oak openings. The members of the Legislature were mainly farmers or merchants, hard-working, practical men, timid from inexperience, and economical from habit and necessity. They made no pretense to a knowledge of science, they would be jealous of all attempts at unnecessary expenditures of money, they knew well how hard it was to pay taxes. But it was necessary that these plain, practical men should be convinced that geology was not only a noble, true science, that its development would redound to the honor of the new State of Michigan, but that the State Survey would be *{{ 27 }}* accomplished within a reasonable period of time, and above all that it would pay. It is honorable alike to Houghton and to the State of Michigan, that at the early period of her independent existence she was willing to appropriate some eight or ten thousand dollars for this noble object. On his part, it had required a thorough knowledge of the science of geology, its prospective bearing on the polity of the commonwealth, confidence in himself, knowledge of men, tact, vigilance, courage and labor. He, indeed, possessed all these qualities, and he accomplished his purpose. It is true he would meet with active, honest opposition. Under such circumstances there will be always found some narrow minded, some ignorant, some obstinate and in opposition, from constitutional meanness, or habitual pugnacity. Some would try their hand at satire or ridicule, but all the arrows of ridicule directed against himself or his pursuits, or insinuations of his boyish inexperience and incompetency, he met with good humor, a sagacious knowledge of the men who opposed, with wit and with unshaken good temper. All these a man can afford to wield when he is sure to win. And in met over every impediment thrown in his path he triumphed.

A State Legislature is a good school in which to study diplomacy, and Dr. Houghton found plenty of occasion for the study of this new art, and for its efficient practice.

Though Dr. Houghton had many friends in the Legislature of the newly organized State, which then met at Detroit, there were many also who could not or would not realize the importance of a scientific exploration of the State; nor was this at all strange. Scientific studies, and especially geology, had up to this time received but little consideration in *{{ 28 }}* America. Excepting the institute at Troy, there was no school of science in the country, no chair of science in any university or college. Practically in the western country it was a subject so new and unknown as to be received with suspicion and indifference.

It became the custom of the more intelligent members to bring to Dr. Houghton's studio the less friendly and intelligent ones, who were there so instructed in the subject nearest to the Doctor's heart as to enable them to form independent judgments.

Among the members of the Legislature of 1837 was a worthy farmer from Macomb County, a man of commanding presence, genial, and a general favorite, but totally ignorant of the first principles of science. Naturally he looked down upon the little Doctor with some contempt, nor would he be persuaded by his best friends to visit the Doctor in his studio, examine his collection and listen to his expositions. He could find on his own farm quite as good specimens of stones, sticks and dry herbs, and he poured ridicule over the whole matter. At last he was induced by a few boon companions to accompany them to Dr. Houghton's house for an evening. They were met by the Doctor - as boon a comrade as the best of them - in his parlor, and all sat down to cards. Dr. Houghton entertained them with stories brim - full of jollity and fun, and it was late when they were ready to leave. Not a word had been uttered on the subject of the survey, or any matter pertaining to science. The Macomb member was delighted. He swore that the little Doctor was a right good fellow, and had more in him than many a man of twice his size. The friendship thus begun never wavered. The *{{ 29 }}* member from Macomb voted for the appropriation, specimens and all, and he remained a firm friend ever afterwards.

Will not even the most exacting find excuse for such finesse in consideration of the end in view? At all events the story will serve to illustrate the versatility of the hero of it, and the ease with which he won the hearts of all. *{{ 30 }}*

CHAPTER III

Appointed State Geologist - Plan of the Survey - Its Character and Results - Annual Reports - Novel Conclusions - Methods - Hardships - Incidents - Suspension of State Survey - Plan for Connecting the Geological with the Linear Surveys of the Public Domain - Its Acceptance - Professorship in the University

Dr. Houghton had a warm, efficient friend and coadjutor in the young Governor, Stevens T. Mason, and on the passing of the law establishing this scientific department of the State, Houghton was immediately appointed geologist.

After a rapid reconnaissance of the State under a small appropriation in 1837, an act was proposed by the Legislature in March, 1838, contemplating a full organization of the geological department

The seasons of 1838 and '39 were spent in explorations of the Lower Peninsula and the portion of the Upper Peninsula bordering on Lakes Huron and Michigan. The reader is referred to the Appendix for a summary and review of the annual reports of the Geological department from its first inception. *{{ 31 }}*

In a brief memoir by Mr. Hubbard published in the American Journal of Science, soon after the death of Dr. Houghton, the scheme matured by the State Geologist is thus alluded to:

"The plan upon which this survey was organized reflected great credit upon the enlarged scientific views and enterprise of Dr. Houghton, and may be considered as a model. It comprehended four departments, namely, geology and mineralogy proper, zoology, botany and topography, each having its official head and assistants, and all united under the general direction and surveillance of the State Geologist. Thus, while all were expected to work in concert, by a division of labor the results would necessarily be more extended and accurate. One of the duties connected with the topographical department may be considered as novel to a geological survey, and could at least be but ill accomplished in any of the older States. Like all the States northwest of the Ohio, the system of rectilinear surveys had been applied to Michigan, by which the State is divided into towns and ranges of six miles square, which again are subdivided into thirty - six square miles or sections. The topographer was directed to furnish the geologist and his two assistants in geology with skeleton plats of these townships, copied from the returns of the Deputy United States Surveyors, on a scale of two inches to the mile, these serving the latter as a basis for laying down with more than ordinary accuracy and facility as well the geological as the topographical and civil features of the country. These being returned to the topographer, were reduced by him to the scale adopted for a series of State and County maps, the publication of which was projected as a part of the results of the survey. The condition of the State finances permitted the issuing of a few only of the maps thus prepared, rather as specimens,

but they sufficed to show that for comprehensiveness, minuteness and fidelity of detail, these maps of the counties of Michigan far exceed anything of the kind ever attempted in this country."

They would have accomplished, had the scheme, for which abundant material was collected, been carried out in the liberal spirit with which it was conceived, and with far more accuracy, what the State and general government have since attempted by triangulations, at a vastly enhanced cost - We shall see that the same idea entered into and formed a part of the plans for connected linear and geological surveys which {{ 32 }} the comprehensive and practical mind of Dr. Houghton subsequently applied to the linear surveys in progress in the Lake Superior region.

The scheme for the survey of Michigan which Dr. Houghton had entertained, and which he now proceeded to mature, showed evidences of that large comprehensive spirit which, reaching out beyond the present aspect of things, grasps the future demands of science. It showed, in fact, a good deal of creative organizing genius, for which the Doctor was not undistinguished. Unfortunately the financial calamities of the country, which fell on the western States with unparalleled severity, proved fatal to a portion of this plan and greatly crippled the efficiency of the Geological Survey proper.

Before the close of the second year he was obliged to abandon the departments of zoology and botany, so that the State lost the great advantage of a prosecution of these kindred sciences, hand in hand with its geology. This was to be regretted, because in the virgin state of the country there would be found many plants and animals which with the progress of settlement would become either wholly extinct or dispersed.

His report for this second year, notwithstanding, comprised very copious and valuable reports by the State Zoologist and the Botanist, of the animals and plants so far made known. A reference to these will be found in the Appendix.

The season of 1840 was passed by the geological corps in an exploration of the southern coast of Lake Superior, and the general results were reported by Dr. Houghton to the Legislature the following February. In regard to the {{ 33 }} mineral wealth of that region, the State Geologist saw very clearly its future importance, but he was extremely cautious in his statements. He knew how easily the public pulse might be excited and speculators induced to rush in and appropriate extensive tracts of mineral land. But the time would soon come when these evidences would be too plain and patent to allow him, from conscientious motives, or any politic scruples, to withhold such information from the public.

His reports sent in to the Legislature, brief but comprehensive, offered such an array of facts bearing on the mineral wealth of the Upper Peninsula, so philosophically deduced, and carrying such order and system into what all previous observers has regarded as unintelligible confusion, that public attention was speedily attracted to that region, and thousands of the bold or

inquisitive residents of States further south and east were soon wending their way to the Lake Superior mineral region.

With few exceptions, all the vast region touching the great lake of the Northwest was an uninhabited wilderness; dense, tangled unbroken forests. These exceptions were the hunting and fishing communities, half Indian, half French, that had found a lodgment under the cliffs of a bleak coast

The novelty of the geological positions taken by Dr. Houghton, and their non-conformity in many particulars with the state of facts existing in other well known mining districts, created a profound incredulity in the minds of those who had received their teachings in other schools of science. In truth, so bold and unlooked for were some of the statements made by the young Geologist of Michigan, that he was at this time (3) {{ 34 }} called by some of the solons of the east "the backwoods geologist," or "the boy who had a good deal yet to learn," and in these phrases, no doubt, there was implied both incredulity and derision.

Perhaps even the accomplished and learned editor of "Silliman's Journal of Science" may be suspected at this time of a want of that catholic spirit of liberality that should always characterize a scientist.

But Dr. Houghton was a courageous and independent observer, and it should be observed here that the lapse of years and the progress of discoveries under more favorable circumstances have absolutely redeemed the sagacious suggestions, and confirmed the almost intuitive accuracy of his observations. Indeed, his conclusions, apparently founded on a limited examination, have proven singularly prophetic This is the more remarkable from the limited means he had at command, the brevity of time he had to complete the exploration, the vastness of the areas to be examined, as well as the extreme difficulties of traversing an unbroken wilderness. But we may repeat and emphasize the fact that all subsequent explorations of this mineral region, so far from discrediting a single fact stated or any position taken at that time by the State Geologist, have confirmed, with singular minuteness, all the theories propounded and every prediction he made. Nor have later observations been able to add much that did not flow mainly from Houghton's acute and cautious examinations.

His fourth and last report of the geology of the Upper Peninsula, Prof. Winchell speaks of as "a masterly description of the mineral veins of the trap, conglomerate and other {{ 36 }} rocks." He says: "Dr. Houghton's report, published in 1841, furnished the world with the first definite information relative to the occurrences of native copper in place on Lake Superior, and the mining interest now rapidly growing up in that region has been to great extent created by the attention directed to it by the report of my late predecessor."

This report of Dr. Houghton's, with others of special interest to the public, that were laid before the legislature, will be found in a subsequent portion of this volume. But the arduous labors which Dr. Houghton

imposed upon himself in developing the geology and mineral wealth of Michigan, can hardly be realized. They have not been told. He was no egotist, and his assistants, taking example from their leader, thought only of duty and success. Now and then we get slight intimations of their labors through reports and letters. By day they were often wading unknown streams, threading a trackless forest, making their observations, securing specimens of rocks, fossils or minerals. The nights often made sleepless by swarms of mosquitoes, drenching storms and the howling of wild beasts. They would eke out the scanty provisions they could carry by such game as they might by chance meet

Exposed thus to cold and wet, to storm and perils of many kinds, it is not surprising that Dr. Houghton's health should have suffered severely. He mentions this in one of his reports, a rare instance of any allusion made by him to the hardships he encountered. To the legislature he says:

Feb., 1841. "It is a matter of regret to me that the sufferings and hardships to which I have been exposed in conducting the field work over this wilderness portions of our State, have so far impaired my health, as to render it impossible for me *{{ 36 }}* to enter into so minute details as had been anticipated. I regret this the more since it leaves many wide spaces in portions of the present report which are of much consequence to a proper understanding of the whole* But since the annual reports are intended to refer rather to the progress of the work, than to its results, and since the whole will be embraced in a more perfect form hereafter, this defect is of less importance than it otherwise would be."

To realize these hardships one must have the experience of living exiled for two or three months in the midst of unknown forests, and being obliged to strip the bark from trees and creep under their shelter to escape the fierce storms by night, satisfied with a few hours of rest, but always in good cheer. Houghton says in one of his letters, "the darkest moments are rendered comparatively light and cheerful from the grand scenes that surround us, and that sense of duty in our pursuits which gives nerve and courage to meet every peril."

It was in the season of 1840 that an incident happened, related to the author by one of the men present, which vividly illustrates the dangers he was destined to encounter. It is mentioned here, because at the time Dr. Houghton lost his life there were persons ready to censure him for needless exposure; they felt perhaps that he had been careless of a life so valuable to science, and so important to his own fame; but this idea would be absurdly unjust. Life to Dr. Houghton must have been as precious as to anyone. It is true he was without fear in danger, and would never spare himself to accomplish a great purpose. In the course of his explorations amid the wilderness, or on the unfrequented waters of the upper lakes, he had often encountered perils of a frightful nature. He had faced these and overcome them. He was indeed fearless to heroism in danger. But he was never reckless at any time, - rather was he deliberate and cautious by nature. *{{ 37 }}*

On this occasion he was making his way along the rock-bound coast of Lake Superior. He was in his "Mackinaw" row - and sail boat, the same that was subsequently dashed to pieces in a storm. Night was approaching, black clouds suddenly overcast the heavens, and the darkness of midnight seemed in a few moments to overshadow them. He was approaching the celebrated Pictured Rocks, well out to sea. But he had some fourteen miles still to reach his destination. His men, obedient to his will, tried hard to keep off from the shore, but the wind blew a gale. Thunder and flashes of lightning added their horrors to the scene. With all their effort to keep out to sea, the storm was taking them directly on the rocks, against which the fierce waves were heard to dash. Houghton saw there was hardly a chance to escape, for their frail bark was speedily sweeping them to inevitable destruction. He knew that at wide intervals along these perpendicular ledges there were narrow breaks or rifts cut away by rivulets. Such a break might possibly, if reached in time, admit of shelter; these were in truth but narrow crevices as it were, sloping rapidly up, and in a storm hardly to be seen. But this was their only hope. While the wind whistled and moaned, and the waves broke in thunder, leaping high up the cliff, the geologist stood firm at the helm, guiding the tossing boat to avoid the threatened wave that might swamp them, his eagle eye taking in the long range of sandstone cliff, watching with intense eagerness, in the midst of this terrific tempest to discover, if possible, one of those slight breaks in the rocky walls that threatened any moment to receive them, to crush and grind them to pieces. The boat now almost touching the dreaded rocks, he might only *{{ 38 }}* discover a possible haven of safety by the lurid flashes of lightning. Suddenly amid breathless silence and the pallid faces of those faithful assistants, save the roar of the elements, that imperfect narrow opening appeared, and the frail bark with its precious freight was whirled in and shot up the slope, safe on the narrow gravelled beach; and here these storm-beaten toilers of the sea remained until daylight.

It will be seen that Dr. Houghton in the prosecution of his favorite studies, and to achieve his great mission, was no mere theoretic, parlor geologist. He loved to study the operations of nature in the midst of her wildest scenes. He would not trust to the speculations of others, however plausible. His mind could only be satisfied when he had put everything into the crucible of observation and experiment, and tested each for himself. Other men have been smitten with this impassioned love of science, this profound desire for new discoveries, but they are not so numerous that we can afford to forget them.

Dr. Houghton had early attached to him several of the young men of Detroit, who became afterwards closely associated with him in his scientific survey of the State; others were drawn to him from sympathy, some were connected with him in business, while others again pursued the study of the natural sciences under his instructions. These associates constituted a kind of club, called sometimes "the Houghton boys." His influence on the deportment and habits, on the intellectual discipline of

these associates was admirable and lasting. How many names of high, hopeful and ardent young friends and co-laborers come up to me as I write this. {{ 39 }}

As he had been the leader when but a child among his little associates, so the same trait was conspicuous now that he had to deal with men. And why should he fear danger among these wild and stormy scenes he was in his chosen element. He never hesitated to race the snow storm, or the sleet of hail; if capsized in an open boat, as often happened, he and his men could swim or wade ashore. In truth he was well fitted for these encounters. He brought to bear his experience, a deep steady enthusiasm, indomitable courage, and heroic self - sacrifice. He had the entire confidence of his boatmen and associates, who were bound to him like children to a parent; and they were inspired by a common danger, they were enthralled by the example of purpose, decision and energy, by confiding counsel and, in fine, by the unflinching resources of genius.

The report of 1841 was the last one made by the State Geologist to the legislature; the poverty of resources of the young State having compelled a suspension of the survey, but Dr. Houghton had other resources within himself.

The linear survey of the public domain had been early projected by the United States government; and these surveys had been in progress in the State of Michigan, as in other portions of the nation's property not yet deeded to settlers. Dr. Houghton had found from time to time great advantage in his explorations by enlisting the intelligent minds of the public surveyors in the cause of geology and the related sciences. In fact the doctor saw in this union a rare chance to carry forward his own scientific examinations on a large and permanent scale. It was indeed at that moment an enterprise opened up to him, novel in its character, quite original, {{ 40 }} and full of promise in the promotion of his special studies. This idea was nothing less than to achieve a thorough geological, mineralogical, topographical and magnetic survey of the new wild lands of the United States, contemporaneously and in connection with the government survey.

As the law making provision for the State geological survey proper would very soon expire, leaving still a large territory in the Upper Peninsula unexplored, Dr. Houghton set about the perfecting of this double and more complete survey of the public domain. At one of the annual meetings of the American Geologists, held at Albany, New York, Dr. Houghton explained his views in regard to the new methods by which he proposed to carry on the public survey of the national domain. This idea was well received by the members of the association, and as chairman of the committee appointed, Houghton proceeded to Washington. This was in 1844, during the session of the 45th congress, that the doctor laid his scheme before the Secretary of the Interior. It was carefully considered, and its objects were approved. Its feasibility, however, was but cautiously admitted. To be sure its great value to these natural sciences was seen and acknowledged. But there were difficulties that seemed to block the way - some indifference and some "red tape," perhaps. Doubts were

expressed if deputy surveyors could be found sufficiently versed in these sciences to undertake such a work with any reliable prospect of success. In this dilemma, Dr. Houghton did not hesitate; he offered at once to take the contract himself, a contract to complete the survey of the Upper Peninsula, making upwards of four thousand square miles, at a price but little in excess of the sum that would be paid for the single {{ 41 }} survey - such as it had been under the established system. This prompt action on the part of Dr. Houghton showed the authorities his entire confidence in the plan he had devised, and inspired confidence on the part of the government to adopt it. Dr. Houghton had already submitted this scheme of survey to the Hon. Lucius Lyon, U. S. Surveyor General, who heartily approved it. It was also endorsed by a joint committee of the State Legislature of Michigan. The Doctor had a corps of surveyors early in the field, and his plan was fully tested before his untimely death. Its success was even beyond his expectations, and prominent scientists, we understand, have expressed regret that this new and enlarged mode of survey of the public lands has not been continued.

The Hon. Lucius Lyon, Senator in Congress, and afterwards Surveyor General, says, in his reports to the Commissioner of the General Land Office, in 1845, speaking of this survey, "that enough has been done to show clearly the great value of such accurate geological and topographical surveys as the one in which he was engaged, and to demonstrate the practicability of carrying them on in connection with the leading surveys of the public realms, without increasing the expenditures of the government for surveying more than one-half a cent per acre over a rough and thickly wooded country like that on Lake Superior. And further, the additional information which such a survey would give if finally adopted, would certainly be worth to the purchaser of the public land far more than the small extra cost. In a mining region its value and importance would be greatly increased. It would enable the government to know at once {{ 42 }} the exact location and probable value of every section and quarter section of the mineral lands."

The reasons for this abandonment have not been given. It will always require some personal enthusiasm and independence to carry forward schemes of improvement in which the public is not immediately aggrandized or benefited. In this more thorough survey of the national domain, the deputy surveyors had been instructed to make notes of soils, forest growth, running streams, coal, and minerals of all kinds, geological appearances, etc., and to make collections of rock specimens and fossils; all these would be received at the General Land Office at Washington. Indeed, Houghton's scheme contemplated a scientific bureau at the seat of government, where would be gathered not only all the information embodied in the field notes, such as must speedily accumulate in this enlarged system of organized labor and observation, extending from the great lakes to the Pacific, but, in addition, there should be found at this bureau duplicate specimens of everything pertaining to the individual States,

as these should advance in their more detailed and scientific explorations.

Such were some of the ambitious plans which the young savant of Michigan had formed - which, indeed, he matured and tested with every promise of success. It was his ambition and his hope to carry this large enterprise to a complete success.

But the sudden and calamitous death of Dr. Houghton prevented even the final report of the geology of the State, as well as the more complete work, including the several departments originally comprised in the survey. But it is due to his memory to state here that the amount of materials in the {{ 43 }} form of maps, notes, charts, drawings, specimens of the geology, botany, mineralogy and zoology, which now enrich the cabinet at Ann Arbor, perhaps surpass those of any other State in the Union excepting, New York. It is needless to say that to the students in these various departments, as well as to the more advanced scientists, their value is not easily overestimated. It is true that since his death large and important additions have been made to the State Cabinet by purchase. His widow has bestowed on the university an extensive and most precious Herbarium, Dr. Houghton's private collection, gathered and preserved through many years. Soon after Houghton's appointment as geologist of the State, the Regents of the University appointed him Professor of Geology and kindred sciences in that institution. He held this chair at the time of his death. The university, which has expanded to such dimensions in the last forty years, was at that time in its infancy, and needed, as it received, the fostering care of enlightened citizens, who were often obliged to give time and labor with slight compensation.

The disinterested sacrifices of men of letters and science during the probationary struggles of liberal institutions are not always remembered after their maturity and success has been assured, Houghton's duties in the meanwhile in the field and wilderness had been too numerous and too pressing to admit of a continuous attention to the special work of a Professor at Ann Arbor. But he found time to give lectures now and then, and his counsel was constantly sought in the administration of its affairs at that time. His influence, indeed, was felt as a magnetic vital power in the embryonic struggles, as in the more mature growth of this favorite institution of Michigan. {{ 44 }}

CHAPTER IV

Honors - Society - Personnel - Home and Family - Popularity - Mayor of Detroit - Anecdotes - Materials for Final Report on the Geology, Topography and Natural History of the State - Social Intercourse - The Detroit of that day - Anecdotes - Association of Geologists - The Storm on Lake Superior - Duty - Death - The News at Detroit - Public Manifestations - General Remarks

It was an honor for a young man not yet thirty years old to be offered the Presidency of the State University, but his reply is equally honorable to him, that he "could be of more service, perhaps, outside, for the present"

During his brief career up to 1844 he had been the recipient of honors at home and abroad, unsought and rare for one so young. And he had organized and conducted a geological survey of the State with singular energy and success.

Let us now go back a few years. Before he was nineteen years old he had been appointed assistant professor at the Scientific School at Troy, N. Y. Yielding to the invitation at Detroit, he had hardly opened his office in the spring of 1830, when he was appointed surgeon and botanist to the expedition for the discovery of the sources of the Mississippi, organized by Henry R. Schoolcraft As President of the Young Men's Society, he succeeded Franklin Sawyer, who was {{ 45 }} afterwards so favorably known as Superintendent of Public Instruction. Within a few years, (1842,) he had been elected Mayor of Detroit for two years in succession. He was made an honorary member of the Academy of Sciences, Philadelphia; a member of the College of Natural History, Vermont; a member of the Hartford Natural History Society, Connecticut; a member of the Literary and Historical Society of Quebec; a member of the Boston Society of Natural History. He was appointed State Geologist of Michigan in 1837; a member of the Geological and Historical Society, Newark Seminary, State of Ohio; an honorary member of the Antiquarian Society, Copenhagen, Denmark; a member of the National Institute of Washington; and Professor of Geology, Mineralogy and Chemistry in the University of Michigan.

Regarding a man so young, the recipient of so many unsolicited honors, and who has left so deep and lasting an impression upon the popular thought and sympathy, it is natural and proper that we should wish to form some definite idea of his personal appearance.

Dr. Houghton's height was about five feet five inches, a little less, perhaps. His father, Judge Houghton, of Fredonia, New York, was small in person, about the size of the Hon. Alvah Walker, of St. Johns, of this State. All the members of his family were of the medium size. His hands and feet were small and delicately formed; his head was large, well developed and well balanced; his nose was prominent like his father's, a little Roman in aspect, and of generous proportions; his eyes were blue, verging towards

hazel; they were well sheltered underneath light but rather massive brows, and were bright and merry at times, and expressed his feelings without {{ 46 }} disguise. His ears had been scarred by that powder explosion, and his nostrils and mouth had retained some marks of that disaster. In early boyhood, he had suffered long and severely from a hip disease, and this had left one leg a little short, not enough to give him a limp, but it had produced a slight inclination to one side, with a swing or roll of the body as he walked; the head somewhat inclined. He was not aware of this himself; these blemishes were instinctively disguised, and so completely that not even his intimate friends would be likely to notice them.

His temperament was warm and nervous; his movements were quick and earnest. His voice rang out with the melody of unaffected enjoyment, or the gayety of social and confiding intimacy. But he had command of all his faculties; he could in a moment control his language and his feelings. His sensibilities were feminine in delicacy; a tale of suffering would suffuse his eyes with tears, an appeal to his kindness or to his purse brought a quick response.

Like most men of ability engaged in the pursuit of science or letters in the new States of the west, Dr. Houghton saw the importance of making friends of the political leaders of parties, and to associate in their minds the cause of good government and wholesome laws with the progress of scientific discoveries. He had, indeed, the faculty of inspiring others with a portion of his enthusiasm, and to awaken a profound respect for his pursuits. He was young, ardent, and generous to a fault. His intercourse with all who had claims on him was - the ideal of frankness and cordiality. Was it strange, then, that he should win all for while he maintained the dignity of science as a pursuit in itself worthy of all devotion and {{ 47 }} every sacrifice, he did not disdain to point out and insist on the economical features of a liberal cultivation of the natural sciences. It may be stated with entire truth, that all the leading men of the State were his friends, most of these warm, efficient, personal friends. They saw in their midst a young man of singular activity, full of knowledge, ready to impart it, and one so earnest, impetuous and generous, that they could not help being drawn to him by a strong sympathy. This admiration, this confidence, came in part, too, from his liberal conduct towards the young men engaged in kindred pursuits, by the high tone and balance of his character, by the fidelity of his attachments; in fine, by the transparent probity of his mind.

But Dr. Houghton would not confine himself exclusively to the study of science; far from this. He was a man - young as he was - of disciplined habits of business. Had he lived, his fortune was assured. He felt every pulsation of the growth and prosperity of the city and State. His credit was excellent, his word was good as a bond. No one had better judgment of the value of real estate in a new commonwealth, and his investments were good. He understood the tactics of political parties, and would not hesitate to bend them to the cause of the sciences he loved. He was himself a fair, temperate thinker and

speaker on all the great questions of national and municipal significance - most catholic and liberal towards all who differed with him, and tolerant of opinions and creeds not his own. But no one knew better than Dr. Houghton that there are times when a man can have but one side, and just stand by the integrity of his principles and of his faith. {{ 48 }} As Mayor of the city of Detroit, we are informed that he often took very decided ground, quite above and outside of party politics. Mr. Silas Farmer, of Detroit, mentions a scene he witnessed at a meeting of the common council. In some discussion the members were excited and loud in their talk, and with evidence of some violence. The doctor bore this for a time, but after a little rebuked them and tried to bring them to order. But after repeated efforts in vain to command silence, he arose from his chair, told them that as Mayor and their presiding officer unless they ceased their wrangling and came to order at once he would vacate the chair and decline to preside over them. This was sufficient; order was instantly restored. It takes a man of nerve and independence to do this. But it was in this way that Houghton won the esteem of all parties and all classes of men. They respected his energetic business habits, and his impartial administration of the municipal government of the city.

For several years before his death, Dr. Houghton, beyond doubt, was the most prominent and most popular man in the State. Everywhere his ability and energy were acknowledged. No name throughout the distant and rural districts was so often uttered. His bold daring, his generous acts, his good humor, his racy stories, were repeated everywhere. There were certain peculiar qualities in this widespread popularity that can hardly be defined or appreciated. Every man seemed to feel a pride in the growing celebrity of Houghton. His long practice as physician had rendered his person familiar and dear to all. His gentle and sweet nature was better than medicine; his skill in his profession was not surpassed. After the necessity of withdrawing from practice, many families {{ 49 }} refused to give him up. All classes, and especially the poor, looked upon him as a personal friend. His stories were always fresh. His small, active figure, his almost boyish manners, the utter absence of all-put-on dignity, were characteristic. But notwithstanding this unstudied and impulsive manner, it must be said that no man would ever think of treating him with undue familiarity. His intimacies were well chosen, and he was scrupulous in his respect shown towards others. It was from this sort of hearty cordiality, and from a nature that was not afraid to be open and frank, came those familiar epithets, "the little Doctor," "our Dr. Houghton," "the boy geologist of Michigan;" these were common throughout the State. His name had become a household word. The young and the old everywhere were eager to serve him. No doubt Dr. Houghton was conscious of this general homage, but he never sought and most certainly never encouraged it.

How much importance he attached to a respectful demeanor in his intercourse with people, the following incident may illustrate. Traveling once with a younger friend, they had occasion to inquire their road, when his

companion called to a lad whom they had met, addressing him as "boy." When they had passed on the doctor mildly corrected him by saying, "Always address such a person as 'young man.' It appeals to his self respect."

At one time he was traversing the woods some hundreds of miles northwest of Detroit, when he came to a farm house. He enquired about the rooks, the sources of streams, coal, iron ore, and the kind of trees in that neighborhood. The farmer was somewhat annoyed by his curiosity - a stranger in a rough (4) {{ 50 }} torn dress and showing such ignorance was offensive, so he cut him short by telling him "he had better go and see old Dr. Houghton, of Detroit; he knew all about such things and had more time to spare than he had!"

As a specimen of humor, we recall his visit to the studio, then on Jefferson Avenue, Detroit, near his house, to announce that he had just come into possession of ten thousand dollars! This would not surprise anyone in those bright days of speculation in corner lots. Some of his young friends present were but too happy to congratulate the Doctor on his good fortune. Nor were they less so when they discovered it to be, not in a land sale, but in the birth of a daughter. This precious gift of fortune was Hattie Houghton, now the wife of the Hon. Morgan, of Coldwater, Michigan, the beautiful mother of sons and daughters.

With such elements of strength and popularity, it should not be surprising to learn that enthusiastic and eager friends were only too ready to bring his name forward as candidate for the highest office in the gift of the people of Michigan. They knew how faithful he had been to public trusts, that he had ripe judgment, and could govern men. It was near the approach of a political convention of 1844 that would select a candidate for governor. At this time the Geologist, with his assistants, were engaged with their work in the woods in the northern parts of the Lower Peninsula; they were exploring the wilderness by day, and camping by night under strips of bark torn from the trees for shelter. He would be clothed in a forest suit less fitted perhaps for the governor of the state than for an out door geologist; and so disguised and roughened would Dr. Houghton appear - with unshaved beard, {{ 51 }} iron-stained boots, torn and dilapidated clothes, that had his fellow citizens caught a glimpse of him at that moment they might have hooted him from their doors. But while thus engaged and thus adorned, and distant from his constituents, he ran the narrowest chance of being made candidate for governor of Michigan, as we learn, almost by acclamation. But in his absence, some judicious friends interfered and very firmly resisted this unsought, and, at that time, undesirable honor. They insisted that the geological survey to which he had pledged himself should take precedence of all other claims. And this, no doubt, would be in accordance with the deliberate views of the Geologist himself. Political honors could wait.

It may be remembered that when Dr. Houghton had been elected mayor of Detroit he was far in the woods pursuing his scientific investigations, and he knew nothing of his

being a candidate till his return to the city. See his letter in Appendix.

The Reports on the Geology of Michigan, commencing in 1838, were sent to the Legislature from session to session, through a period of four or five years. These reports, with one exception, are brief, but they are drawn up with care; they are full of valuable information, evidences of labor and thought, often betraying an acute forethought touching certain geological phenomena, that will not be overlooked by the reader. A phrase will indicate a principle; a few words will often comprise the result of many days of patient and perilous examinations. But they were always clear, and expressed with singular felicity. These reports were not intended to present a full exhibit of his labors in the field through the {{ 52 }} preceding year; far from this. They were made brief as possible, that the members of the Legislature should have a general idea of the progress of the work.

But a more complete account of the whole geological system of the state would be reserved for the indoor work, where he could command the time to arrange his materials for the final report. Such a work was not only in contemplation, but had already made great progress. See the remarkable unfinished volume in manuscript at Ann Arbor.

This large folio volume is very fully and beautifully illustrated by outline maps of the coast touching Lake Huron, the Straits of Mackinac, Lake Michigan and islands, showing the outcropping of rocks, forest growth, soil, mountain ranges, sand-dunes, head-lands, gulfs and bays. Besides these, and the collection of rocks and minerals, varied specimens of soils, etc., etc.* deposited in the University, are many drawings, beautifully executed on wood by the State Topographer, of fossils, geological sections, views, etc., designed for the final volumes.

Such is the work that was being prepared for the citizens of Michigan and for the scientific world. Though incomplete it is still a monument of labor, design and method. It may be observed that this manuscript volume has been open and free for the inspection and study of all students in natural science, either in Michigan or in other states. No man ever had more faithful or more disinterested aid than Dr. Houghton.

It may be remembered that these young men, his assistants, who had been his faithful co-workers had not been trained in any school or branch of science; and for this reason the [care and exactness by which the reports of Mr. Bela {{ 53 }} Hubbard and Mr. C. C. Douglass and others have been drawn up, is the more remarkable. It is another striking instance of that trait in Houghton's character, the skill of choosing his men. They were very young men, including the Doctor himself, they made no pretense to being experts in natural science, they had to educate themselves to become good observers, and this is no small matter. It requires vigilance and practice to discriminate the various kinds of rock and minerals, of bog ore, coal and soils, and no inconsiderable amount of study to master even the nomenclature of a science.

In regard to certain problems involved in the discussion of the question of the presence of minerals in the Upper Peninsula, the upheaval of rocks, the origin of mineral veins, and their deposition in rocks apparently not conformable to other regions, in portions of the globe corresponding to Lake Superior geology; these and Belated questions would engage Houghton's 'earnest attention. They had never been solved by others - hardly had they been intelligently entertained. ' Houghton would form his opinions as he went forward and got light. He was in no haste to proclaim them. In the progress of his careful examinations, his theories would become certainties, and after his convictions were thus sustained by hard facts that had come under his own eyes, from personal inspection, he had the courage to proclaim them.

A> meeting of the American Geological Society met in Albany, N. Y. Young man as he was, coming from a far western state, a new name in the galaxy of bright stars that shone in the eastern firmament, he had claims to be heard; he arose to his feet in his place to address the learned assembly. He had studied the subject of the Lake Superior mining {{ 54 }} region. His opinions founded on his own experience were presented to the association in a modest but clear manner, and he sustained these views with his usual earnestness and ability. It should be remembered that the association was composed of such men as Prof. Hall, the Rogers brothers, of Pennsylvania, Dana, Silliman, Torry, and many others, many of whom were among the most distinguished of living geologists. They would naturally be somewhat incredulous of these new and dubious theories of the "backwoods geologist of Michigan." This quality of independent thought and action on the part of Dr. Houghton has not been surpassed. It was very conspicuously shown in his views on the subject now under discussion.

He was, indeed, little disposed to be led by other men; he would reject the authority of names. He was not afraid* of new paths if they would lead him to truth. Houghton was willing to see and accept facts with his own eyes, and to apply them with his own honest convictions. Still the Doctor was shy of new theories or mere speculations in science. This feeling might even reach to over-caution or dread. He was by nature cautious, and his hesitation to accept speculative views in science will be remembered as a marked trait in his whole career. His letters and reports attest this.

As may be inferred, the social qualities of Dr. Houghton were among the elements that drew friends to him. On all subjects connected with the natural sciences his information was very full and his conversation entertaining. His descriptions of the characters he had met on the water or in the woods were graphic and racy. He was well read in books {{ 55 }} pertaining to the sciences he was pursuing, and kept up an extensive correspondence. He could hardly drop into a store or office without being surrounded by a group of admirers. He was quick and cordial to make friends.

As an instance of tact, we remember a little occurrence at his house one day on Wayne Street. The Doctor, looking

through the window, saw or supposed he saw a gentleman passing whom he wished to see on some special business, and called to him or tapped on the window; but he discovered his mistake when the tall form of Bishop McCoskry walked into his sanctum. They were not at that time personally acquainted. The Doctor, however, instead of being embarrassed or ready to apologize, received him with cordiality. He at once began some inquiries as to certain features of the country northwest, where he knew the Bishop had been visiting some missionary station, I think, among a small tribe of Indians. It was not necessary that the Bishop should know that Dr. Houghton had made a little mistake. The acquaintance thus commenced was a very cordial one and often of service.

The cause of temperance in these primitive days had not made much progress in Detroit Good old Jamaica rum, apple toddy, and the sparkling champagne, were as free as water, and many citizens were better acquainted with their seductive qualities than with the natural beverage of their wells.

Houghton was brought into close intercourse with all classes, and no one would enter more heartily into social life, and it is saying a good deal when we declare that he was absolutely temperate. This resolute abstemiousness was {{ 56 }} based on conviction and principle, and will be sufficiently appreciated by those whose memories can go back to the period of 1829 to '40. Houghton united with a few other friends of the cause to form the first temperance society of Detroit, and was its first president.

At that period Detroit was famous for the elegance and refinement of its inhabitants; at the same time society was marked by a charming simplicity. It had been a military post for many years. The governor of the territory was a gentleman of noble presence and of high attainments. It was the residence of a major-general of the United States army. It was often visited by Major-Gen. McComb, commanding general of the national forces. Several families connected with the military had become fixed residents. All these were persons of pleasing manners. The Whitings, the Hunts, the Casses, the Riddies, the Farnsworths, the Trowbridges, the Hastings, the Masons, and other conspicuous families, were abounding in hospitalities and entertainments. Nor was it all dissipation; far from this. There was beauty and gayety, but not a spark yet of shoddy and pretense. The night might be given up to champagne and some "noise and confusion," but there was the balance wheel of culture, love of order, and love of ideas. There was a ready and prompt appreciation of merit. Good manners and good intentions then had their due weight but for accurate knowledge, for a quick sagacity, for a genial temperament, young Houghton was equal to the foremost. His education had been thorough. No man in the territory could stand before him. This was not classical, for reasons that have been seen. It was scientific rather than literary. His manners were open, direct and confiding. His {{ 57 }} mind had been well disciplined by the habit of writing and by lectures. It was prompt and accurate by a responsible intercourse with men of affairs, even before he was twenty years old. Dr.

Houghton embodied in the character of his mind the Baconian maxim that "Reading makes a full man, talking makes him ready, and writing makes him accurate."

Houghton had the instincts of a gentleman; he was quick to consider the feelings of others. His patience would be often tried by careless or impertinent callers, frequently speculators in disguise, who would draw from the Doctor information touching the mineral land or the salt springs, but we have no remembrance of any show of irritation under severe trials.

To escape interruption he often commenced his hard studies late at night, and they were prolonged into the small hours of the morning. Houghton was a bright example of the students of a liberal science; no one can recall on his part a single act of narrow jealousy, though he himself did not always escape the concealed weapons of the envious and the illiberal.

To escape the possible imputation of taking advantages of his opportunities, Dr. Houghton avoided while in the employ of the state all speculations, though his chances for such were peculiar and abundant.

The writer was in Canada when Mr. Wm. Logan, afterwards Sir William, and so well known as an eminent geologist, first reached the upper province. Kingston was temporarily the seat of government. Mr. Logan had just been appointed geologist of Upper Canada. Before he commenced the examination of Canadian rocks it was important that he {{ 58 }} should know what had been done on the opposite shore. Mr. Logan was in great perplexity. He was not familiar with the labors of the New York geologists nor those of Ohio. He entertained some doubt how his inquiries would be received. It will be remembered that he was an Englishman and we were "Yankees;" that in Canada a good deal of ill-suppressed irritation still existed among all classes, growing out of what has been termed the "Patriot War." Mr. Logan was an accomplished amateur artist as well as a scientist, and he had called several times on the writer. Learning his anxiety and hesitation, we wrote Dr. Houghton, then in Detroit, but without the knowledge of Logan. In a few days Mr. Logan received a letter from Dr. Houghton full of generous expressions of welcome, and the offer of every assistance he could give, proffering access to all sources of information his department could furnish. This was very agreeable to a stranger, and the Canadian geologist called immediately to express his thanks and gratification.

It was said of Charles Fox, the great orator and liberal statesman of English history - this was the language of Edmund Burke - that it was impossible to know him and not love him. There was a charm in the deportment and manners of Houghton that one could not resist. His quick sympathy and hearty appreciation drew friends to him and secured their co-operation. His devotion to science, his profound insight into principles obscure often to others, the dangers he encountered, the wilderness he explored, the coasts he traversed, these had made his name associated with that of Humboldt. The nerve, the courage, incessant toil and splendid achievements of the late French

savant, Victor Jaquemont, {{ 59 }} strongly remind us of the bright but brief career of the Michigan geologist

The readers of this memoir of Dr. Houghton will pardon the author if he shall dwell at some length on such traits and anecdotes as will tend to illustrate his character. It will be remembered that after a lapse of more than forty years, there will not be found many incidents of his life that can be recalled. It is incidental to a new country that its pioneers shall give their services and their lives to build up and develop the resources of the country, whose population at the time will be but little impressed with the value of such labors. At a later day, when a succeeding generation may desire to do honor and raise monuments to their memory, it will be found that much of the detail of life, many acts and many incidents that would throw light on a career, have passed away forever. No instance can be recalled of his taking credit for generous acts. The following occurrence is here mentioned, and will be remembered by some of the old friends:

An uncle of Dr. Houghton had bought a farm in Wisconsin, and had moved his family from Chautauqua County, N. Y., to his new home. The financial cyclone of '38 overtook him there, and the mortgage on his farm would soon be foreclosed unless paid. In feet, he was in peril of losing his homestead and his family reduced to poverty. He had no resources in Wisconsin. He must seek Dr. Houghton, in the hope that he would be able to relieve him. To do this, he would have to "foot it" a good many miles even to reach a stage coach, and it would take a full week to reach Detroit. In twenty days his day of grace would run out. At that time {{ 60 }} there were no railroads and no telegraphs. Mr. Douglass could not know the fact, but Dr. Houghton himself was deeply embarrassed and hardly knew how it would be possible for him to get through the panic. Perhaps no city in the Union suffered more from the utter prostration of business and collapse of credit than did Detroit.

But the Doctor, when his uncle reached him, worn with anxiety and wearied with travel, cheered him with hope. \$700 was necessary to be raised. A good many old professional debts were still outstanding. Houghton resolved that he would raise this amount. He did not write notes and send out bills, but with bills in his hands he started out determined to collect the amount. In forty-eight hours the amount was raised, some of it borrowed, and his uncle started for his home rejoicing, reaching his home just in time to save it.

Those who knew Dr. Houghton will remember that such an act as this was not exceptional with him.

The following is related by a friend who was with him traveling east by stage from Toledo along the lake shore - this was before the days of railroads. Houghton was on his way to Albany to a meeting of the Association of Geologists. The roads on the low ground by the lake shore in the autumn season were usually bad. Progress was slow; the coach was full of passengers all impatient of delay and mostly disposed to be in bad humor. This friend, an eminent lawyer of Buffalo, the Hon. Henry W. Rogers, a great story teller himself says that Dr. Houghton's resources

were marvelous and inexhaustible. A coach full of total strangers, cramped and confined, shy of too much confidence, like most American travelers, would resist these attacks on their reticent dignity. But long {{ 61 }} before they reached Albany, Houghton's versatility, his winning ways, his good humor, had captivated everyone. There was one exception, however; an elderly gentleman, who would not yield to these noisy seductions, but wrapped himself in his dignity and reserve. He was also a geologist on his way to Albany, but the two gentlemen were strangers. On his reaching Albany, this stranger and member of the association soon found the hall where his associates were to meet. His surprise may be imagined, when he saw his recent companion of the stage coach, rise to his feet to address the Association!

But we are a little in advance of our journey. The stage was to pass through Fredonia, the residence of his parents; it would pass through about twelve at night. The Houghton mansion stands on the edge of the village. A half mile, perhaps, before they reached the house, Houghton got out of the stage, and ran ahead through rain and mud, to have an interview with his mother. He would not ask the passengers to wait for him. This tender affection for his mother was a living flame of his soul; a tap on the window would bring them again face to face; a few cheering words, a promise to come and make a visit, some advice left for the family, an embrace and a blessing, and the eager, resolute young savant was off and again striding through the mud to overtake the coach. Nothing but death could cool or abate that profound love and devotion he felt for his parents. It is impossible to do justice to Houghton without a reference to these traits of his character; his brothers and sisters he held as dear as his own life.

Mrs. Houghton, the Doctor's young wife, was the daughter of a Mr. Stevens, of Fredonia, New York; they had known {{ 62 }} each other from childhood. She was a young lady of culture and refined sympathies. As soon as the Doctor's business would allow it they were married, and the young couple commenced their housekeeping. Doctor Houghton bought the substantial frame house on or near the corner of Wayne and Lamed streets, where the family continued to reside up to Houghton's death.

Mrs. Houghton was well known to all the leading families of Detroit - a devout Christian, a devoted wife and mother. Her goodness and her charities were the natural offspring of a most tender sympathizing nature and sound Christian principles. She made her home a welcome resort of her husband's friends, and her own winning and sincere manners contributed largely to the social popularity of the Houghton house. She was the mother of two daughters, Hattie and Mary, both now living; the eldest is the wife of the Hon. Mr. Morgan, of Coldwater, of this State. Mary is married to Dr. Houghton, who settled in Chicago; both these gentlemen are graduates of the Michigan University.

Long before and during the first years of the geological survey, the Doctor's house had virtually become a museum of natural history. His private collection was large; he had already accumulated a valuable library, both miscellaneous

and scientific. All the lower rooms were given up to these and to the increasing volume of specimens in all branches of natural history. They were constantly accumulating from many sources, and he was finally forced to seek larger rooms for his accommodation. These he found on the corner of Jefferson and Woodward avenues, where the Young Men's Library was until recently located. {{ 63 }}

Dr. Houghton had now, in the mil of '45, brought his great labors so far to a close, and so near the time when he would be able to devote his mind to the methodizing his materials, as really to offer him some prospect of comparative rest. He could look back on these struggles with some satisfaction. Although his health had suffered severely, he might hope for a restoration, and for a completion of that fame, the foundation of which had been laid in a fervid devotion to the great mission of his life.

In these pages we have traced his career in the State of his adoption almost from boyhood. The practice of his profession as physician and surgeon in Detroit, with a high reputation, seemed to him only a means. His mind was bent upon the study of the sciences. He saw that this State offered a field for new and important discoveries. He had no fortune to spend, that he might carry on these explorations and labors without assistance; he must educate people up to this great theme; and that wealth which would be the outcome of the scientific examination of the resources of the State of Michigan, could only be made a certainty by the united action of the Legislature and the enlightened friends of culture. It was his resolute and persistent mind that would unite these various conflicting elements and fuse them into a power that he could wield. In truth, such was his hopeful nature and the faith he had in his own power, that he never had a doubt of success. All along, his progress was upward and onward. He never halted; even from the moment he landed from the steamer at Detroit, we might believe almost, that a premonition of a brief life had admonished and impelled him to incessant toil. A Christian philosopher has said, that "he {{ 64 }} who is cut off in the execution of a noble enterprise has at least the honor of falling in his ranks, and has fought his battle, though he missed the victory."

It was on the 13th day of October, 1845, that Dr. Hough* ton was lost on Lake Superior. He had left Eagle River in the morning in an open sail boat, making his way along the shore west some eight or ten miles. The Doctor wished to reach the camping ground of his surveying company under the superintendence of a Mr. Hill; as this corps of men were to remain through the long winter in this region, Dr. Houghton desired to give them his final instruction, as he would soon return to Detroit. It was late before he reached these men, and the interview was necessarily prolonged into the night. Mr. Hill then advised the Doctor to wait till morning, but Houghton had important dispatches that should go to Eagle River, and down the lake by schooner. As the vessel would leave in the morning, it was really important that he should be there, as these opportunities at that season would be very rare, and his anxiety was the greater, therefore, not to fail to be at Eagle River that night. A storm threatened, but it would take only a few

hours to get back, and the night was not dark. They were in an open boat propelled both by sail and oars. The wind was rising; a snow storm had set in. The Doctor was at the helm, as was his custom. They were obliged to take in sail and depend on the oars. There were five men in the boat. The weather was cold; October on Lake Superior is a late season. They put out about nine o'clock at night. At this time the wind was blowing hard from the north. They had not gone many miles when they discovered that the boat was making but slow progress, {{ 65 }} though the men were bending well to their work. A storm of snow sharpened by a northern blast beat in the faces of the weather-hardened mariners. It was now necessary to put well out to sea to get around a point of rocks, a low, broken promontory that shelved to a considerable distance seaward. Dr. Houghton's anxiety to reach Eagle River no doubt betrayed him here; but he was not daunted, he encouraged his men to brave the storm. The waves had increased in violence and were running high. We must remember that this was an open boat with five men, his faithful dog - a black and white spaniel, Meeme by name, who was always with the Doctor, and often of service - his specimens, valuable field book, instruments, notes, etc., such as must accompany him at all times. The frail bark could only be propelled now by oars in the midst of this whirl of wind and wave. The Doctor was accustomed to steer his own boat, especially when there might be danger. They had now rounded the point, and at intervals could see the light through the haze of the storm, at the mouth of Eagle River. Houghton knew the coast well. He was familiar with such storms, and within sight of land did not fear the result. It is easy for us now to say that he ought to have paid more heed to the signs of the coming tempest. But who can blame him for trusting to his own judgment, to his own skill and good fortune. Heretofore these had never deserted him. By courage and intrepidity he had often escaped destruction. No man under such circumstances can determine the extent of danger, or the moment when he must not venture another chance. His men even now proposed to go ashore, which in itself would be perilous, but the Doctor encouraged them to proceed. "We are not {{ 66 }} for from Eagle River," he said; "pull away, my boys, we shall soon be there - pull steady and hard." Did he imperil the lives of his men, so did he his own life. No danger that they could be exposed to would he shrink from. But amidst the increased violence of the gale the boat encountered the surf and was instantly capsized. They all went under for a moment; Dr. Houghton was raised from the water by his trusty companion and friend, Peter McFarland. He told the Doctor to cling to the keel, then uppermost. "Never mind me," cried Houghton; "you go ashore if you can. Be sure I'll get ashore without aid." Everything in the boat was now lost, scattered on the tossing waves; but the men were all good swimmers, and very soon the boat was righted, the water bailed out, and these devoted heroes all again at their oars obedient to command. But this bright interval was of brief duration. In a moment after, a wave struck her with such force, that the vessel receiving the blow at the stern was dashed high in the air, the boat going over endways, and everyone thrown again into the tumultuous

sea. Even at this moment they were not over two hundred yards from the shore. Two of these hardy mariners with exhausted bodies, reached the rocky beach, or rather were thrown with violence on the stones in a helpless condition. But the leader of that devoted band, in spite of Peter's heroic efforts and his own unshaken courage, went down not again to rise. It was in this way and at that moment that Douglass Houghton perished.

It would be impossible to describe the mournful disappointment and grief that touched all hearts when the news of this calamity reached Detroit. It was, indeed, a sincere and {{ 67 }} profound sorrow. The citizens of Michigan who had watched his progress with so much pride felt now that the most gifted man in the state had been suddenly and mysteriously cut off at the very moment when he was to achieve victory. A light, luminous and expanding had been extinguished. Every man grieved as for the loss of a Relative. The city in truth was in mourning. Some outward expression of these overpowering feelings would find utterance. The common council was convened for this purpose by the mayor of Detroit. Tender resolutions of appreciation and sympathy were passed, affecting allusion being made to the Doctor as so recently presiding over their deliberations. But this action of the common council was thought to be insufficient to express the popular and widespread sentiment of distress. A public meeting was therefore called at the city hall, that the citizens at large might be able in this way to give a wider and more emphatic expression of this universal sorrow. At this meeting resolutions offered by the Hon. Zina Pitcher, his early and fast friend, were passed, that embodied the utterance of the most tender sentiments of love, admiration and condolence. In the streets you would hear these words: "Is it true that Douglass Houghton is dead" "Is it possible that we shall see our friend no more." Such were the exclamations everywhere heard. His fellow citizens could not give him up. No affection, no sorrow could equal this, unless some precious member of one's family had been snatched suddenly from a mother's arms. His whole life so far had been an honor to the state. In science he was distinguished abroad; at home his friends expected to crown him with a special honor. They would place him in the highest position in their power to bestow. {{ 68 }}

He had, indeed, so identified himself with the best interests and the future of Michigan, was so replete with intellectual and progressive life, so intrepid in action, so faithful to the highest duty. In the course of Houghton's labors through the wilderness or on the bleak coast of the north, how few of his friends in the southern part of the state could realize the dangers that surrounded him. These perils were constant and far more imminent than could be realized except by those who had shared his hardships. The citizens of Detroit watched his return from these explorations with increasing interest. The story of wreck, of passing down foaming cataracts, of crossing swollen rivers, of wet powder, of short rations, of storm without shelter; these were told everywhere. But no one ever thought that Dr. Houghton might at last rail a sacrifice to these

exposures. This sort of confidence in his star, in his future, was shared by the whole community.

The entire coast east and west of Michigan, and the shores of Lake Superior had been traversed. The vast wilderness, from the extreme eastern shores of the Upper Peninsula to the banks of the Mississippi, on three widely separated but approximately parallel lines, had been threaded in person by Dr. Houghton. His assistants were able and efficient; they were devoted to their chief - all glowing with confidence in him and faith in the future. So far the very elements had shielded him. The glory of new discoveries in science, a generous ambition, lifted him above the thoughts of rest or fear. Though broken in health, neither storm nor the wilderness had any terrors for him. He was often in the presence of sublime scenes of nature; the forest growth of untold centuries, or the shattered masses of rock, evidences of irresistible *[[69]]* and sudden disturbance. He had but few words to express his emotions, but he had all the sensibility to appreciate the grandeur of such scenes. These he felt to be the work of a power beyond that of man, and he loved to contemplate them. This communion with nature removed from his mind the clouds of doubt that might gather there. The deep forests, the rocky coasts, the moaning winds, all spoke to him in a voice which he could understand.

'These aspects of nature he loved; long intimacy with such had made them, as it were, his companions. With all his gayety of manner and social impulses, there was in the constitution of Houghton a deep sentiment of reverence for the mysteries of nature, - not the systems of man. He did not discuss religious themes, but his convictions were deep and sincere. He respected the creed and services of the church in" which he was nurtured, but he did not attempt to solve the mysteries of faith or God's providence. But amidst his labors, surrounded by the visible marvels of the greatest of architects, he saw, "God's temples not made with hands." If indeed he was not bound to any sect, if he was shy of mere forms of worship, he might yet see Deity in the clouds and hear His voice in the winds; - nor could it well be otherwise, but that these studies, these associations, should lead him to reverence; and science, the dream of his life, did not undermine his faith.

It was amid this tumult of the wild elements of nature, amid forces that no skill and no courage could master, in the good cause of science, truth and duty, bravely and tenderly he yielded up his spirit.

The Upper Peninsula of Michigan had not been explored in any systematic manner before the time of Houghton. The *[[70]]* large masses of pure copper that had been seen from time to time by adventurous travelers in that region, and especially that unique mass on the banks of the Ontonagon, had excited great curiosity. But all these strange, loose pieces of copper vein but boulders out of place. They had no Relation necessarily to the rocks in the immediate neighborhood. Although an English company in former years had had the faith or the temerity to sink a shaft on the spot with "great expectations," the scientific truth could only be determined by the careful examinations of a geologist.

These outlying boulders of copper had been known for a century, but they had misled everyone. Years before Dr. Houghton had been appointed geologist of the State, he had traversed that pathless region, first by the northern shores of the peninsula, and afterwards more centrally and mostly through a dense wilderness. These earlier explorations were extended to the banks of the Mississippi. It was these labors that gave the Doctor intimations of the true Relation of the rocks to each other, so that when he entered on the survey to which he had been appointed, he was not without definite views and strong convictions touching the mineral wealth of the Upper Peninsula; and his subsequent official studies of this little known region resulted in a confirmation of these earlier conclusions to which his mind was advancing.

In science, as in letters and art, there must be enthusiasm; nor can we ignore the force of the imagination. It is by this divine gift that the mind can achieve great discoveries and great triumphs. Houghton's enthusiasm sustained him amid all these past hardships and sufferings; nothing else could have carried him through. These labors, this enthusiasm, *[[71]]* will remind one of the great Scotch geologist, the word-painter of the old "Red sand Stone Memory," whose works awakened such profound interest throughout England and America, forty years ago. But Hugh Miller had one advantage over the Michigan geologist; his rocks were more recent, and were alive, so to say, with the fossil remains of a remote and mysterious vitality. The reconciliation of these discoveries with certain questions, or axioms of his theology, perhaps disturbed the serenity of an intellect of admirable force; and possibly, at last, shrouded in clouds a life that had been devoted with extraordinary zeal to the cause of science. But there must be a charm beyond language to express, to be delving among rocks that at any moment may open to the eyes some embodied silhouette or skeleton of a fish or reptile - some embryonic form that shall point to a connection or an evolution of extinct races of being.

This promise of fossil existence among the granite and trap rocks of the Upper Peninsula was not offered as a stimulus to Dr. Houghton; he knew they must be barren of this interest

One of the greatest of students in science, especially in geology and rock literature, was Louis Agassiz. A careful examination of the deep canons of the Swiss Alps had occupied him for several years. The mysterious moraines of these valleys and the striated surfaces of shales and granite, the cutting along the sides of mountain declivities, were phenomena of a mysterious and unexplained nature. They had been noticed by all observers, and they had puzzled and confounded all. But Agassiz saw in these strange but uniform phenomena the stupendous action of the land ice-bergs, and the grand *[[72]]* system of the glacial degradation of mountain ranges of granite was thus evolved. Fortunate was Agassiz beyond most men that he not only lived long enough to see his views fully confirmed and accepted by the savants of the world, but that his lot had been chosen among a people that could appreciate and reward his genius.

The northern portion of Michigan presented a geographical area of great extent; not less than three hundred miles, touching Lake Superior, stretching west and northward, and from fifty to seventy-five miles in width. It was almost wholly a dense wilderness. The few fishing and trading posts along the coast would be considered hardly an exception. Before Houghton's time no one had pretended to solve the mysteries that hung over these deep forests, these rugged upheavals of granite, trap, sand and metamorphic rocks. There had been intimations of the presence of minerals of great value. But as no one had been able to determine the Relation of these rocks to time and place, so no definite knowledge as to their contents could be possessed by any one, for those portions of the rock that were visible along the coast, or within gorges that had been opened by disruption, or cut by water courses, presented in fact so much of confusion and complexity, that all observers heretofore had been baffled in every conjecture about them. To examine these with the eyes of an outdoor scientist, to bring the labor, the patience, the power of endurance to bear on these problems, would demand rare qualifications on the part of a geologist and a close inspection of scattered and isolated facts. Their value when applied to theories and results, required a cool head and acute powers of reasoning. In these discussions important principals {{ 73 }} were involved, and his standing before the world of science would be tested. It required, indeed, a remarkable grasp of thought to be able to arrange and methodize these wide spread and often obscure facts, and so fuse them as to display the genuine metal of truth. That Dr. Houghton possessed these essential qualities no one can doubt who will study the record of labors he has left behind, his letters herein published, and his masterly reports to the legislature. Some of these reports and letters are now for the first time placed before the citizens of Michigan in a connected popular form.

It has been undertaken to give in an Appendix a careful summary of all the reports which emanated from the departments, while under the surveillance of the first state geologist. These constituted the basis of all the explorations that have since followed, and though much has been published by other men of science, covering the same ground fully and well, the earlier reports can never be superceded (*sic*) in interest and importance to the people of Michigan. It has been the aim of this summary to note the more important points and conclusions, free from the cumbrous array of facts.

As the report of 1841 upon the geology of the Lake Superior district has long been entirely out of print, no apology seems to be needed for its republication here in full.

The summary is followed by a review or general statement of all that has been published on the geology of Michigan since the death of Dr. Houghton.

Prof. Alexander Winchell, of the Michigan University, has in generous words repeatedly given Dr. Houghton that need of praise and honor which he had so well earned. Prof. Winchell was appointed State Geologist in 1859. {{ 74 }}

Speaking of the labors of Houghton, he says: "Though the work was unavoidably arduous for the Geologist, and expensive for the State, it served to acquaint us at an early day with many of the sources of our mineral wealth, and to awaken and maintain a lively desire for full and definite information Relative to the coal, salt) gypsum, copper and iron, of which the published reports of progress had afforded hasty glimpses. Dr. Houghton's report, published in 1841, furnished the world with the first definite information Relative to native copper in place on Lake Superior, and the promise of wealth now so rapidly growing up in that region, has been, to a great extent, created by the attention drawn in that direction by the report of my lamented predecessor."

The sudden death of Dr. Houghton arrested the progress of the Geological Survey of the State. The final report so often alluded to in his brief papers to the legislature, and which must so much depend on Houghton's faithful performance, has never been given to the public. In the meantime, the labors and sacrifices of the great Geologist are passing out of the memory of men. The notes left by Dr. Houghton, or a compilation of them, together with such materials as could be collected intended for his final report, would have been published, it is stated, but for the refusal of the Executive to act on the resolutions of the Legislature empowering the Government to cause such publication to be made.

There is hardly a sketch of his life to be found in any of our public libraries. His able reports are entirely out of print; it is difficult if not impossible to find a copy, while every season gives us new evidence of the value of his explorations. All his discoveries and his convictions are being {{ 76 }} confirmed by subsequent observers, and while the State is being enriched by his unpaid labors, his fellow citizens who enjoy the honor he conferred on the State, are to a great extent ignorant of the life and labor of Douglass Houghton.

A discourse by Prof. Alvah Bradish, giving some more full account of Houghton's earlier life, and tracing somewhat his earlier career, has been read by invitation before several scientific and literary societies. It was read before the Young Men's Society, of Detroit. The invitation in this case seemed particularly appropriate, as both Dr. Houghton and Mr. Bradish were among the first members and founders of that literary society. It was read before the members of the Audubon Club. Once before the Pioneer Society of this State. The Historical Society of Buffalo had invited its reading before its members, and in 1879, Prof. Bradish read his discourse by invitation before the Senate and House of Representatives at Lansing.