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IN MEMORIAM
JOSEPH HENRY.

ADDRESS

OF

HON. JAMES A. GARFIELD,

AT THE

MEMORIAL MEETING

IN THE

HOUSE OF REPRESENTATIVES,

Tuesday Evening, January 16, 1879.

"And who hath trod Olympus, from his eye
Fades not the broader outlook of the gods."

WASHINGTON.
1879.

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ADDRESS
OF
HON. JAMES A. GARFIELD.

Addresses having been delivered by Senators HAMLIN and WITHERS, and by Dr. Gray and Prof. Rogers, Honorable JAMES A. GARFIELD, a member of the House of Representatives and of the Board of Regents of the Smithsonian Institution, then delivered the following address:

Mr. PRESIDENT: In the presence of these fathers of science who have honored this occasion with their wisdom and eloquence, I can do but little more than express my gratitude for the noble contribution they have made to this national expression of love and reverence. So completely have they covered the ground, so fully have they sketched the great life which we celebrate, that nothing is left but to linger a moment over the tributes they have offered and select here and there a special excellence to carry away as a lasting memorial.

No page of human history is so instructive and significant as the record of those early influences which develop the character and direct the lives of eminent men. To every man of great original power, there comes in early youth, a moment of sudden discovery—of self recognition—when his own nature is revealed to himself, when he catches, for the first time, a strain of that immortal song to which his own spirit answers, and which becomes thenceforth and forever the inspiration of his life—

"Like noble music unto noble words."

More than a hundred years ago, in Strasbourg on the Rhine, in obedience to the commands of his father, a German lad was reluctantly studying the mysteries of the civil law, but feeding his spirit as best he could upon the formal and artificial poetry of his native land, when a page of William Shakespeare met his eye, and changed the whole current of his life. Abandoning the law, he created and crowned with an immortal name the grandest epoch of German literature.

Recording his own experience, he says:

At the first touch of Shakespeare's genius I made the glad confession that something inspiring hovered above me. * * * The first page of his that I read made me his for life; and when I had finished a single play, I stood like one born blind on whom a miraculous hand bestows sight in a moment. I saw, I felt, in the most vivid manner that my existence was infinitely expanded.

This Old World experience of Goethe's was strikingly reproduced, though under different conditions and with different results, in the early life of Joseph Henry. You have just heard the incident worthily recounted; but let us linger over it a moment. An orphan

boy of sixteen, of tough Scotch fiber, laboring for his own support at the handicraft of the jeweler, unconscious of his great power, delighted with romance and the drama, dreaming of a possible career on the stage, his attention was suddenly arrested by a single page of an humble book of science which chanced to fall into his hands. It was not the flash of a poetic vision which aroused him. It was the voice of great Nature calling her child. With quick recognition and glad reverence his spirit responded; and from that moment to the end of his long and honored life, Joseph Henry was the devoted student of science, the faithful interpreter of nature. [Applause.]

To those who knew his gentle spirit, it is not surprising that ever afterward he kept the little volume near him and cherished it as the source of his first inspiration. In the maturity of his fame, he recorded on its fly-leaf his gratitude. Note his words:

This book under Providence has exerted a remarkable influence on my life. * * * It opened to me a new world of thought and enjoyment, invested things before almost unnoticed with the highest interest, fixed my mind on the study of nature, and caused me to resolve at the time of reading it that I would devote my life to the acquisition of knowledge.

We have heard from his venerable associates with what resolute perseverance he trained his mind and marshaled his powers for the higher realms of science. He was the first American after Franklin who made a series of successful original experiments in electricity and magnetism. He entered the mighty line of Volta, Galvani, Oersted, Davy, and Ampère, the great exploring philosophers of the world, and added to their work a final great discovery which made the electro-magnetic telegraph possible.*

It remained only for the inventor to construct an instrument and an alphabet. Professor Henry refused to reap any pecuniary rewards from his great discovery, but gave freely to mankind what nature and science had given to him. [Applause.]

*As a fuller statement of the steps by which the telegraph was achieved I append a passage from an address which I delivered at the Morse memorial meeting, in the Hall of the House of Representatives, April 16, 1872:

"The electro-magnetic telegraph is the embodiment, I might say the incarnation, of many centuries of thought, of many generations of effort to elicit from nature one of her deepest mysteries.

"No one man, no one century could have achieved it. It is the child of the human race, 'the heir of all the ages.' How wonderful were the steps which led to its creation! The very name of this telegraphic instrument bears record of its history—'electric, magnetic.'

"The first, named from the bit of yellow amber whose qualities of attraction and repulsion were discovered by a Grecian philosopher twenty-four centuries ago; and the second, from Magnesia, the village of Asia Minor, where first was found the loadstone, whose touch turned the needle forever to the North. These were the earliest forms in which that subtle, all-pervading force revealed itself to men. In the childhood of the race men stood dumb in the presence of its more terrible manifestations. When it gleamed in the purple aurora, or shot dusky-red from the clouds, it was the eye-flash of an angry God, before whom mortals quailed in helpless fear.

"When the electric light burned blue on the spear-points of the Roman legions it was to them and their leaders a portent from the gods beckoning them to victory. When the phosphorescent light, which the sailors still call Saint Elmo's fire, hovered in the masts and spars of the Roman ship, it was Castor and Pollux, twin gods of the sea, guiding the mariner to port, or the beacon of an avenging God luring him to death.

"When we consider the startling forms in which this element presents itself, it is not surprising that so many centuries elapsed before men dared to confront and question its awful mystery. And it was fitting that here, in this new, free world, the first answer came revealing to our Franklin the great truth that the lightning of the sky and the electricity of the laboratory were one; that in the simple electric toy were embodied all the mysteries of the thunderbolt. Until near the beginning of the present century the only known method of producing electricity was by fric-

I observe that these venerable gentlemen who have spoken, express some regret that Professor Henry left their higher circle to come down to us; and to some extent I share in their regret. Doubtless it was a great loss to science. I remember that Agassiz once said he had made it the rule of his life to abandon any scientific investigation so soon as it became useful. I fancied I saw him and his brethren going beyond the region of perpetual frost, up among the wild elements of nature and the hidden mysteries of science, and when they had made a discovery and brought it down to the line of commercial value, leaving it there, knowing that the world would make it useful and profitable, while they went back to resume their original search. [Applause.] I do not wonder that these men regretted the loss of such a comrade as Joseph Henry.

But something is due to the millions of Americans outside the circle of science; and the Republic has the right to call on all her children for service. It was needful that the Government should have, here at its capital, a great, luminous-minded, pure-hearted man, to serve as its counselor and friend in matters of science. Such an adviser was never more needed than at the date of Professor Henry's arrival at the capital.

The venerable gentleman of almost eighty years, who has just addressed us so eloquently, has portrayed the difficulties which beset the Government in its attempt to determine how it should wisely and worthily execute the trust of Smithson. It was a perilous moment for the credit of America when that bequest was made. In his large catholicity of mind Smithson did not trammel the bequest with conditions. In nine words he set forth its object—"for the increase and diffusion of knowledge among men." He asked and believed that America would interpret his wish aright and with the liberal wisdom of science.

A town meeting is not a good place to determine scientific truths.

tion. But the discoveries of Galvani in 1790, and of Volta in 1810, resulted in the production of electricity by the chemical action of acids upon metals, and gave to the world the Galvanic battery and the Voltaic pile, and the electric current. This was the first step in that path of modern discovery which led to the telegraph. But further discoveries were necessary to make the telegraph possible.

"The next great step was taken by Oersted, the Swedish professor, who, in 1819-20, made the discovery that the needle when placed near the galvanic battery was deflected at right angles with the electric current. In the four modest pages in which Oersted announced this discovery to the world the science of electro-magnetism was founded.

"As Franklin had exhibited the relation between lightning and the electric fluid, so Oersted exhibited the relation between magnetism and electricity. From 1820 to 1825 his discovery was further developed by Davy and Sturgeon, of England, and Arago and Ampère, of France. They found that by sending a current of electricity through a wire coiled around a piece of soft iron, the iron became a magnet while the current was passing, and ceased to be a magnet when the current was broken. This gave an intermittent power, a power to grapple and to let go at the will of the electrician. Ampère suggested that a telegraph was possible by applying this power to a needle.

"In 1825, Barlow, of England, made experiments to verify this suggestion of the telegraph, and pronounced it impracticable on the ground that the batteries then used would not send the fluid through even two hundred feet of wire without a sensible diminution of its force.

"In 1831, Joseph Henry, now secretary of the Smithsonian Institution, then a professor at Albany, New York, as the result of numerous experiments, discovered a method by which he produced a battery of such intensity as to overcome the difficulty spoken of by Barlow in 1825.

"By means of this, his discovery, he magnetized soft iron at a great distance from the battery, pointed out the fact that a telegraph was possible, and actually rang a bell by means of the electro-magnet acting on a long wire.

"This was the first step in the series of great discoveries which preceded the invention of the telegraph."

And the yeas and nays that are called from this desk from day to day are not the supreme test of science, as the country finds when we attempt to settle any scientific question, whether it relates to the polariscope or to finance. [Laughter.]

For ten years Congress wrestled with those nine words of Smithson and could not handle them. Some political philosophers of that period held that we had no constitutional authority to accept the gift at all [laughter] and proposed to send it back to England. Every conceivable proposition was made. The colleges clutched at it; the libraries wanted it; the publication societies desired to scatter it. The fortunate settlement of the question was this: that, after ten years of wrangling, Congress was wise enough to acknowledge its own ignorance, and authorized a body of men to find someone who knew how to settle it. [Applause.] And these men were wise enough to choose your great comrade to undertake the task. Sacrificing his brilliant prospects as a discoverer, he undertook the difficult work. He drafted a paper, in which he offered an interpretation of the will of Smithson, mapped out a plan which would meet the demands of science and submitted it to the suffrage of the republic of scientific scholars. After due deliberation it received the almost unanimous approval of the scientific world. With faith and sturdy perseverance, he adhered to the plan and steadily resisted all attempts to overthrow it.

In the thirty-two years during which he administered the great trust, he never swerved from his first purpose; and he succeeded at last in realizing the ideas with which he started. But it has taken all that time to get rid of the incumbrance with which Congress had overloaded the Institution. In this work Professor Henry taught the valuable lesson to all founders and supporters of colleges, that they should pay less for brick and mortar and more for brains. [Applause.] Under the first orders imposed upon him by Congress, he was required to expend \$25,000 a year in purchasing books. By wise resistance he managed to lengthen out the period for that expenditure ten years; and a few years ago he had the satisfaction of seeing Congress remove from the Institution the heavy load by transferring the Smithsonian library to the Library of Congress. The fifty-eight thousand volumes and forty thousand pamphlets of rare scientific value which are now upon our shelves, have added greatly to the value of the national library; but their care and preservation would soon have absorbed the resources of the Smithsonian. When Congress shall have taken the other incumbrance, the national museum, off the hands of the Institution by making fit provision for the care of the great collection, they will have done still more to realize the ideas of Professor Henry. [Applause.]

He has stood by our side in all these years, meeting every great question of science with that calm spirit which knew no haste and no rest. At the call of his Government he discovered new truths and mustered them into its service. The twelve hundred light-houses that shine on our shores, the three thousand buoys along our rivers and coasts testify to his faithfulness and efficiency.

When it became evident that we could no longer depend upon the whale fisheries to supply our beacon-lights, he began to search for a substitute for sperm oil; and after a thousand patient experiments he made the discovery that of all the oils of the world, when heated to 250° Fahrenheit, the common, cheap lard oil of America became the best illuminant. That discovery gave us at once an unfailling supply, and for many years saved the Treasury a hundred thousand dollars a year.

He had no such pride of authorship as to cling to his own methods when a better could be found. He has recently tested the qualities of petroleum as an illuminant, and recommended its use for the smaller lights. In instances far too numerous to be recounted we have long had this man as our counselor, our guide, and our friend.

During all the years of his sojourn among us, there has been one spot in this city across which the shadow of partisan politics has never fallen; and that was the ground of the Smithsonian Institution. We have seen in this city at least one great, high trust so faithfully discharged for a third of a century that no breath of suspicion has ever dimmed its record. The Board of Regents have seen Prof. Henry's accounts all closed; and, after the most rigid examination, the unanimous declaration is made that, to the last cent, during the whole of that period his financial administration was as faultless and complete as his discoveries in science. The blessing of such an example in this city ought at least to do something to reconcile these men of science to the loss they suffered when their friend was called to serve the Government at its Capital.

Remembering his great career as a man of science, as a man who served his Government with singular ability and faithfulness, who was loved and venerated by every circle, who blessed with the light of his friendship the worthiest and the best, whose life added new lustre to the glory of the human race, we shall be most fortunate, if ever in the future, we see his like again. [Long continued applause.]

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