ALEXANDER DALLAS BACHE. The Late Superintendent of the Const Survey

A Biographical Sketch Rend Before the
Franklin Institute by Professor Fairman

At the regular monthly meeting of the Franktin Institute held March 17, Professor Fairman Rogers read a carefully-prepared and elaborate biographical sketch of the late Professor Alexander Dalias Bache, the world-celebrated Superintendent of the United States Coast Survey. The long and brilliant connection of Professor Bache with the scientific interests of this country, and the circumstance of his being, in the true sense of the term, a Philadelphian, prompt us to lay the entire sketch before our readers, which we are enabled to do by the receipt of an advance proof copy of the "Transactions of the Franklin Institute," through the kindness of Professor Henry Morton, the Secretary. Professer Rogers' sketch reads as follows:-

Alexander Dallas Bache, the subject of our memoir, was born in Philadelphia, on the 19th of July, 1806. His father, Richard Bache, was a son of Richard Bache, Postmaster-General of the United States, and Sarah, only daughter of Benjamin Franklin. His mother, Sophia Dallas, was the daughter of Alexander James Dallas Secretary of the Treasury, and the sister of George M. Dallas, Vice-President of the United States and Minister to London.

Mr. Bache was thus connected with families alike distinguished for scientific and intellectual attainments and social position in his native city. In 1821 he entered the United States Military Academy at West Point, and graduated at the head of an uncommonly good class in 1825, remaining for about a year after his graduation as assistant instructor in engineering. He was then assigned to engineer duty at Fort Adams, Newport, R. I., where he remained two years, with General, then Colonel Totten, and while there became engaged to Miss Fowler, to whom he was married in 1828-a woman adorned with those good qualities which enabled her to be his firmest friend and most able adviser throughout his life. In 1828 Mr. Bache was appointed Professor of Natural Philosophy and Chemistry the University of Pennsylvania, at the age of 22, and it is from that time that his scientific career commences. In 1836 he was appointed the first President of Girard College, and made his trip through Europe in the interests of that in-Upon his return, finding that much time must yet clapse before the College buildings could be finished, he offered his services to the city to reorganize its High School, and at the end of a year, the College not yet being in a condition to require his attention, he resigned his salary, but retained the office of President, holding himself ready for duty when the building should be in readiness, and became Principal of the High School and Superintendent of Public Schools, for which he received a salary from the city. He again took his old chair in the University in 1842, and in 1843 he was appointed Superintendent of the United Spates Coast Sur vey, which position he held until his death, which occurred on the 17th of February, 1867.

Such is a brief record of one of the most useful and brilliant lives of the past half century. devotion to science, in the highest acceptation of the term, knew no bounds. His enthusiasm not only carried him forward, but it communicated itself to all who came in contact with him One reason that he did so much work, was that he was hundred-handed. The moment that he made the acquaintance of a new man he saw what he was good for, what he could do, and, by some mysterious power, he set him to work. When he proposed a line of research, or a mat ter to be worked up, it always seemed to him to whom he proposed it, that here was just the opfor which he had been waiting, and he attacked it with vigor and determination. the great chief always had many hands and brains occupied with the details of the matters which were at the time interesting him, and these outside labors met with so much consideration, and were so handsomely acknowledged, that no one hesitated to repeat them when called upon a second time. No scientific man could render a greater service to science than by encouraging its younger votaries to take up and to persevere in those investigations for which nature may have fitted them; and in this Mr. Bache was eminently successful. He showed this conspicuously when, even as a young man, he was interested in the operations of this Institute, and it is in his labors as one of

Very shortly after his appointment to the University, Mr. Bache connected himself with the Franklin Institute. On the 25th of March, 1830, his name first appears in the records of the Soclety as chairman of the monthly meeting of that date, and from that time until his departare for Washington, in 1844, he was a prominent member, serving faithfully on most of the important committees. He was in the Board of Managers from 1831 to 1839, and Corresponding Secretary from that time until 1843. He served for many years on the Committees on Meteorology, Inventions, Instruction, Meetings, and Publication, and on the Committees on Patent Laws and the Manufacturing Establishments of Pennsylvania, The Committee on Inventions was extended into the Committee of Science

and the Arts in 1834.

our old members that we are especially inte-

He was appointed on the Committee on Ex-plosions of Steam Bollers and Strength of Materials in June, 1830, and labored faithfully as a member of both its sub-committees, taking a large part in the preparation of the report, which is still considered one of the classical authorities on the subject. He also took a large share in the labors of the Committee on Experiments on Water Power. As a member of the Commit-tee on Weights and Measures, in 1833, he took a large share in the preparation of the valuable report on that subject. In October of 1842 he delivered the address at the close of the annual exhibition. During all this time he contributed many papers to the Journal and to the Philosophical Society, of which he was an active member. He edited an American edition of Brew-ster's Optics, and conducted a large number of investigations in magnetics, meteorology, and physical science generally. This was probably the time of the greatest activity of the institute, and Mr. Bache had associated with him as fellow-workers, and as staunch friends for all after life, S. V. Merrick, Frederick Fraley, Dr. Hare, M. W. Baldwin, T. U. Walter, Sears C. Walker, J. C. Cresson, J. F. Frazer, men whose names we now honor as among the brightest lights of the society.

In 1843, Mr. Bache having received the appointment of Superintendent of the United States Coast Survey, left Philadelphia, and, of course, his active duties in the institute, to take up his residence in Washington; but he always considered this city as his home, and looked forward to returning to it at some future period. when his labors for the Government should be ended; and one of his greatest pleasures was to meet his old associates on the occasions of his frequent visits to Philadelphia, and talk over the times when they worked together for the interests of the institute and of science

When Professor Bache took hold of the survey, he found himself in a position which required all his tact to make comfortably tenable. Some of the older assistants felt aggrieved that a person hitherto unconnected with the work should have been selected as its head, and for many months there was a disposition to make things go roughly, which might have disheart-ened a man who had smaller views. or less disposition to seize upon the opportunity afforded him to make his new work one of the grandest contributions to the science of the age.

Extreme firmness, imperturbable good humor, and a manner which made all who approached him friends and totally disarmed his enemies, finally enabled him to overcome all obstacles in the interior of the survey; and he applied himself with all his energy to the elaboration of the organization, and the introduction of all the best scientific methods, most of which he extended in their practical application to a point not be-

fore reached. He soon enlisted the best scientific power of the country, either as officers of the Survey, as temporary assistants for some special work, or as friends, who, for pure love of the man and interest in a work to which he devoted his ener-

gies, were always ready to contribute their advice or co-operation in those matters which belonged specially to their line of study. It was in this

or co-operation in those matters which belonged specially to their line of study. It was in this way that he won the title of "Chief," applied to him by a large and ever-increasing circle of scientific men, who appreciated him as the leader of organized science in America.

His peculiar position gave him advantages which could hardly be enjoyed by any other scientific man. Visiting each seoboard city frequently in the discharge of his official duties, he was constantly in personal contact with his acquaintances, and had every opportunity of seeing the new men who grew up in each place. Accustomed to the details of commercial and political business, he had much broader and more practical views than those which are somenore practical views than those which are some times the result of seclusion in the study or the laboratory. The fact of his having graduated with all the honors of the Military Academy placed him upon a footing with the officers of the army and navy, which was of the greatest advantage to him in his connection with both branches of the service. It has always been usual to detail some army and navy officers for duty upon the Survey, and it not unfre-quently happened that Bache had to administer one of his quiet reproofs to some young officer, who, forgetting, or perhaps ignorant of the fact, that his Chief was a regular the fact, that his Chief was a regular army man, would attempt to plead a "custom of the service" or a point of etiquette as an objection to some distasteful duty. Of that rare power of administration which appears to be partly natural and partly the result of education, Mr. Bache had a large share, and the scientific and business operations of the Survey moved like clock-work under his guiding hand. He loved o put the machinery together, wind it up, and then, dismissing it all from his mind, hear the report at the end of the month or designated time, when he would take up the thread of the matter just where he had last left it, and as if he had thought of nothing else during the interval. He understood thoroughly the way of doing nothing for himself that could be done for him by others and thus reserved his time and his powers for that work which he alone could do. His practical knowledge of methods of observation was extraordinary, and he could pick out interpolated figures in records of work, or tell an astonished observer that on such a night he had omitted to examine the level of his instrument, with an accuracy that bordered upon the mar-

His capacity for work was astonishing. Not contented with the large and ever increasing labors of the Survey, he was an active member of the Board of Regents of the Smithsonian Institution: associated there with his warmest and most trusty friend. Professor Joseph Henry, of the Light House Board, of numerous special boards on harbor improvements, President of the National Academy of Sciences, and ready at ill times, and constantly called upon, to use his tongue or his pen to advance the true interests

of science at all points. It is not common that with those abilities to which we have referred are combined those soial qualities which render their possessor agreeable in ordinary life; but Mr. Bache possessed them in an eminent degree. Released from his official duties, about which he was usually very methodical, he was the pleasantest companion at the dinner table or in the saloon that young or old could desire. Extremely fond of society his hospitable house in Washington was always open to his friends, who carried away with then the most charming reminiscences of its bright wood fires and sparkling candles, and in hi summer camps there were always some extra tents for those who were fortunate enough to receive invitations to visit him in his wild retreats. He spent several months of each year under canvas, at the primary triangulation stations, or on base measurement, and returned to his duties in the capital refreshed and invigorated by the mountain air, long strolls, and change of scene. Bright reminiscences are those of these mountain camps, with the morning writing, the midday dinner, the genial face of the kind hostess, the pleasant chat over the bot-tle of Rhlne wine, and, if there was no observing in the afternoon, the long rambles down the hill, with the climb back again, the camp being of necessity very near to the summit, finishing up with an evening of conversation or reading unless the stars were good enough to allow themselves to be observed.

With a never flagging determination to carry the scientific operations of the Survey up to and beyond the highest point of excellence attained in other countries, Mr. Bache spared no pains or thought in perfecting all the details of the various processes with such success that in every branch important steps were made. To the ap paratus for the measurement of bases especially as being the instrument upon which the accuracy of succeeding work depended, he early turned his attention, and produced a base mea surer which is yet without its equal in the world. In 1845 he took up the subject, and discarding the principle of using surface marks or dots on the measuring bars, and bringing them into coincidence by means of microscopes, he applied the contact level already invented by Respold for another purpose, and by thus introducing the method of end contact, facilitated the comparisons with the standard bars, the practical working in the field, and the accuracy of the operations in, a remarkable degree. The extremely beautiful method of equalizing the conducting power and consequent rapidity of expansion of the iron and brass bars of the apparatus, by making their sections proportional to their conducting powers and specific heats, and then making the final and most delicate correction by applying varnishes of different colors, is an admirable ample of the care which he bestowed upon the

smallest details. Having found the metrical system in use on the Survey as introduced by Mr. Hassler, he continued it, and always felt a deep interest in the adoption of that, or of some other universa system of weights and measures, by the civil-ized world. His position as Superintendent of Weights and Measures, of course, brought the subject constantly under his notice. As a member of the Committee on Weights and Measures of the National Academy, he also discussed the matter thoroughly, and at one time he leaned evidently towards making an attempt to establish, by a Congress of nations, an entirely new standard, which should be adopted as an universal one. His two general objections to the metrical system were: first, the fact that later observations have shown that the metre is not the 10,000,000th part of the earth's quadrant; and secondly, that the actual length of the metre is not, in practice, nearly so convenient as that of the foot or the ell. The latter is no doubt the strongest objection that can be made to the metre as an universal standard, and perhaps the only one; and later, Mr. Bache seems to have determined that the metric system had too strong a hold to be rooted out by any other where i already has been adopted, and was prepared to give his unqualified support to any measure-looking to its adoption as an universal system. It is a little singular that the period of his death witnessed the legalization, to a limited extent, of the metric system in England and the United States, and the consummation of one of his most cherished projects, the determination, by the Atlantic Telegraph Cable, of the difference of ongitude between Greenwich and Washington longitude between Greenwich and Washington, which was made for the Coast Survey, in December of 1866, by Dr. B. A. Gould. For several years, in fact since the laying of the original cable, everything has been prepared for these observations, and the preliminary report of their success was made to the National Academy of Sciences in January, but one month before his death.

During the Rebellion Mr. Bache threw him-self, heart and soul, into the service of the Gov-ernment, and took a most ardnons part in the labors of the blockade commission at the very outset of the war. His judgment and far-sightedness enabled him to withdraw his par-ties and vessels from the South almost without a loss, and no information of any value fell into a loss, and no information of any value fell into the hands of the Rebels from Coast Survey sources. The Survey furnished most valuable officers during the war for military surveys, and they were much needed, since the engineer officers, being all graduates, were rapidly pro-moted to line appointments, and technical knowledge in that branch of the staff was sadly

In 1861 Mr. Bache became Vice-President of

the Sanitary Commission, and was throughout the war a most influential member of that im-portant body. When Lee threatened Philadelphia in the Gettysburg summer, Mr. Bache did not forget his native city, but immediately offered his services, and those of the officers he had near him, to make a military reconnoissance had near him, to make a military reconnoissance of the vicinity of the city, and to locate works, to be built if the necessity required. In that sultry summer weather he worked, literally, day and night, and exhausted a frame never much accustomed to severe bodily exercise, and it is doubtful whether he ever recovered entirely from the effects of the labor and worry which he underwent at that period.

which he underwent at that period.

When the National Academy of Sciences was established by Congress, in 1863, the choice for President fell, without dissent, upon Mr. Bache, and he continued to discharge the duties of the office with the program of the continued to the contin office with the greatest energy and judgment until his illness withdrew him from active labors. His guiding hand, his moderate counsels, and ais constant vigilance in seizing upon every turn which could be of advantage to the scientific usefulness of the Academy, were of the utmost importance to its welfare and power. In the spring of 1864 his health began to fall him. Too much intellectual labor had done its work; the body was too weak for the mind, and a long summer rest, and finally a trip to Europe, were prescribed as the cure. Temporary relief, how-ever, was all that these means afforded, and he spent the remainder of his life in Newport, where ne had commenced his public career after leav-

ing the Military Academy.

He died in Newport on the 17th of February, 1867, and was buried at Washington, in the Congressional Cemetery; on Sunday, the 24th. The honors paid to his remains as they passed through New York, Philadelphia, and Baltimore, were a fitting tribute to his virtues. He was laid in state in the old hall of the Philosophical Society, which, in the early days of his Phila-delphia career, had known him so well, and all his friends who knew him in life, and many who, knowing him only through his works, loved him almost as well, crowded around the bier to pay their last tribute of respect to his

It is rare that a man leaves us without a successor appearing to take his place, but the void which Mr. Bache leaves in the general scientific strength of the country has not yet been filled.

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FOR LIVERPOOL AND QUEENSTOWN. Inman Line of Mail Steamers are appointed to sail as follows:

City of Manchester, via Halifar, Tuesday, May 4, at IP.M. City of Ealtimore, Saturday, May 8, at 2 A, al. City of Bosten, via Halifar, Tuesday, May 18, at 1P.M. And each succeeding Saturday and alternate Tuesday, from Pier 45, North River.

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NOTICE.—FOR NEW YORK, VIA

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The business by these lines will be resumed on and after the 5th of March. For Freights, which will be taken on accommodating terms, apply to

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