SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE OFFICIAL NOTICES AND PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

FRIDAY, AUGUST 23, 1901.

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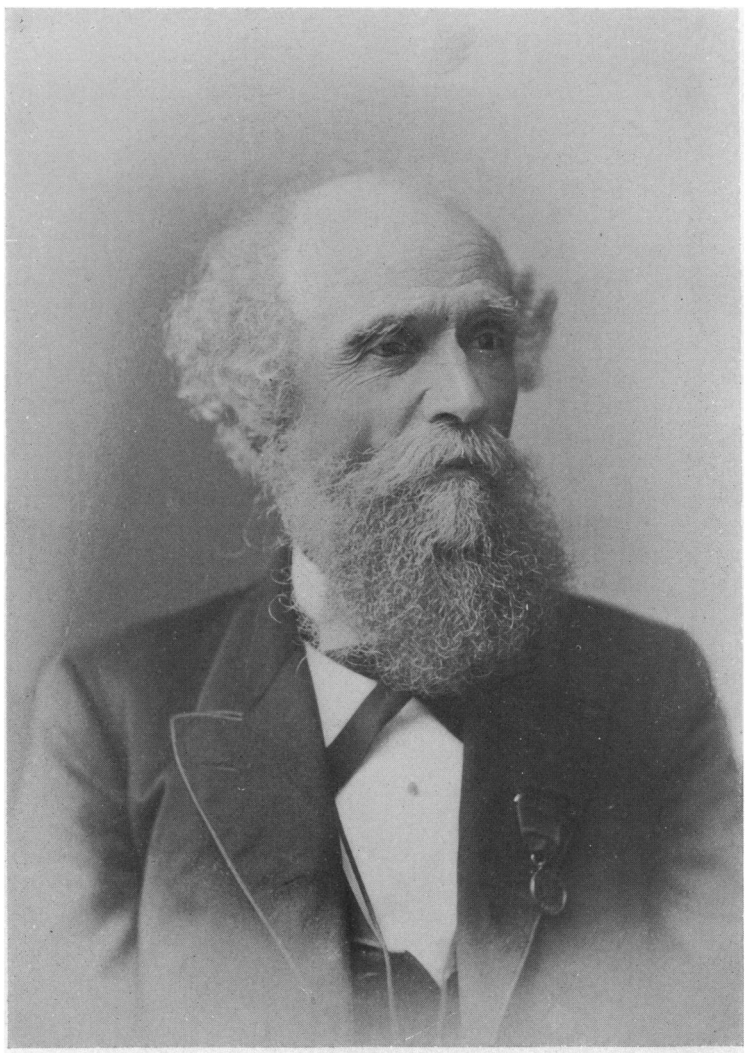
MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

JOSEPH LE CONTE.

JOSEPH LE CONTE was born in Liberty county, Georgia, on February 26, 1823; he died in Yosemite Valley, July 6, 1901. In the years spanned by these dates he lived a life well worthy of respectful commemoration, a life whose record must exercise a benign influence upon the rising generation of scientific workers. To make such a record is not the purpose of this brief article. Here all that may be attempted is a grateful acknowledgment of having known and worked with the man, to outline his career, to indicate the goal he aimed at and the chief turning points on the highway of his life as he pursued that goal, and to make some loving comment on the most salient features of his personality. To those who feel keenly, as the writer does, the imperfection of this sketch, it will be a satisfaction to know that at the time of his death Professor Le Conte was engaged upon, and had practically completed, his autobiography, and that this will be published at an early date.

Joseph Le Conte was of French descent. His earliest American ancestor was Guillaume Le Conte, a Huguenot, who fled from Rouen after the revocation of the edict of Nantes, served under William of Orange in England, and finally settled in this country near New York, in the year 1698. His grandson Louis was born in 1782, graduated



Very truly yours
Joseph LeConte

from Columbia in 1800, and in 1810 moved to Liberty county, Georgia, where he had inherited a large plantation. Here he married Ann Quarterman, a lady of English Puritan descent. Of these parents Joseph Le Conte was born, one of a family of four sons and three daughters.

Louis Le Conte divided his time between the management of his estate and the pursuit of scientific studies, particularly chemistry and botany. He maintained a botanical garden which was famous in its day as one of the best in the country. Joseph Le Conte received his elementary education at a local school, but his father's tastes and scientific work exercised a powerful influence upon his youthful mind as it did also upon that of his brother John, and both were early drawn to the pursuit of science as their life work.

In those days almost the only profession that afforded an opening to scientific pursuit was that of medicine, so that, after graduating from the University of Georgia, both brothers entered upon the medical course at the College of Physicians and Surgeons, in New York, Joseph receiving the degree of M.D. in 1845.

It was in the summer vacation of 1844, when a young man of 21, that Joseph Le Conte made his first noteworthy geological excursion. In this year he joined the *first* prospecting and exploring expedition to the now famous mining district of the south shore of Lake Superior. The writer has several times listened with delight to Professor Le Conte's account of this boating cruise from the lower lakes to Keewenaw Point, of his camping adventures, and how, after a sojourn of a few weeks with the prospectors on Keewenaw Point, he and his cousin with some Indians proceeded on a long canoe voyage along the south shore to the present site of Duluth, and thence to the upper waters of the Mississippi and down to the Falls of St. Anthony, long before a cabin existed on the site of the cities of Minneapolis and St. Paul.

After receiving his medical degree he practiced medicine at Macon, Georgia, from 1845 to 1850. In 1847 he married Caroline Elizabeth, the daughter of Alfred M. Nisbet, at Midway, near Milledgeville, Ga. His wife, one son and three daughters survive him. In 1850, feeling doubtless that the practice of medicine failed to afford those opportunities for the study of natural science to which he was so strongly inclined, and being drawn by the fame of Agassiz, he abandoned medicine and went to Cambridge. Here under the influence of the great interpreter of nature, his own career as a devoted student of science was finally determined. It is doubtful whether any other disciple of this great teacher has done more to advance the cause of nature study among the people of this country. In the early part of 1857 he was associated with Agassiz in a study of the keys and reefs of Florida, and it would be difficult to cite a more captivating study for two such kindred spirits, or a study where geological and biological interests are more intimately knit together. Late in the same year, having received the degree of B.S. at Harvard, he returned to Georgia and was elected to the chair of natural science in Ogelthrope University. This post he resigned the following year to accept the chair of geology and natural history in the University of Georgia, in which institution his brother John was the professor of natural philosophy. Here he taught for four years. In 1856 the brothers both resigned their chairs and accepted calls to South Carolina College, at Columbia, Joseph to be professor of geology and natural history and John to be professor of physics. They held these positions till 1862, when the college succumbed to the trouble arising out of the Civil War. These were busy years at Columbia; in the enjoyment of the con-

genial society of the place they were pleasantly spent, though sadly interrupted.

When teaching gave way to more serious duties Joseph offered his services to the Government of the Southern Confederacy, and was for a time engaged as chemist in the government laboratory for the manufacture of medicines, and later as chemist at the Nitre and Mining Bureau at Columbia, of which his brother John had been appointed superintendent. In this work he continued till the close of the war.

In 1866 the University of South Carolina was reorganized and the brothers resumed their professorships. But in the crippled condition of the community it soon became apparent that it would be long before opportunities for scientific work would be opened up. Their private fortune had been swept away by the war, and when in 1868 they were invited to join the initial staff of the University of California, then being organized, they both accepted. At the age of 46 Joseph Le Conte thus became professor of geology, botany and natural history in the University of California. The title of his chair was changed in 1872 to 'geology and natural history,' and this chair he held up to the time of his death.

From this brief sketch of the mere externals of Professor Le Conte's career, the character of his life-work as a student and teacher of natural science must impress the reader. This impression will be sustained and strengthened by a glance at the long list of his writings appended to this article. He was no narrow specialist, yet he was an authority in advance of his contemporaries in several distinct lines of scientific and philosophical inquiry. His earliest writings of scientific importance had to do with the phenomena of binocular vision, which he discussed in a long series of papers, published chiefly in the *American Journal of Science* and in the *Philosophical Magazine*, between the years 1868 and 1880. These essays were enlarged and published in his well-known book of several editions entitled 'Sight.' This work is generally recognized as an important contribution to our knowledge of the subject and is remarkable for that lucidity of style and felicity of graphic illustration and simile which characterize, indeed, all his writings. While issuing these papers he was, after coming to California, actively engaged in geological studies. Various excursions in the Sierra Nevada and in the Cascade Mountains of Oregon led to important discoveries. He announced the age and character of the Cascade Mountains and their relation to the great Columbia lava flood; he described the ancient glaciers of the Sierra Nevada, and was among the first to recognize the post-Tertiary elevation of the Sierra Nevada, as shown by the river beds. His studies on mountain structure led him to important generalizations on the origin of mountains in general, and he became one of the chief exponents of the 'contractional theory' of mountain building. His studies on ore deposition at Steamboat Springs, Nevada, and Sulphur Bank, California, led him to a discussion of vein formation in general; and his classification of ore deposits has been widely recognized as resting on a sound basis and is not displaced in its essential features by the most recent attempts in the same direction. He also made important contributions to the subjects of seismology and coral growth in its geological aspects.

In 1878, he published his 'Elements of Geology,' a book which has had, perhaps, a more extensive use in the schools and colleges of this country than any other textbook in the natural sciences. This was followed in 1884 by his 'Compend of Geology,' a more elementary treatment of the same work. He was also interested in many other scientific and medical subjects such as 'The Problem of Flight,' 'The Func-

tions of the Liver,' 'Ptomaines and Leucomaines in their Relation to Disease,' 'The Larynx as an Instrument of Music,' etc. The mere mention of these varied subjects indicates the breadth of his interests and sympathies, but they by no means measure his intellectual activity. He was an active and successful exponent of the doctrine of evolution, and extended its principles to many fields of thought. Indeed, the evolutionary idea was the dominant note in nearly all his many philosophical writings and addresses. His strong advocacy of evolution as a principle running through all nature may be regarded as the most fruitful of his life's labors. On the battle ground, not long since so fiercely contested, between science and religion, he did splendid work, not, however, intensifying and embittering the strife, but in the work of conciliation, in the demonstration to thoughtful man in the camp of the churches that there could be no real conflict between seekers for truth whether in the pulpit or in the laboratory; that science sought simply the truth, nothing more, nothing less, and that in so far as scientific truth rested on a verifiable basis it was futile for the church to assail it.

But science, philosophy and religion failed to suffice his vigorous intellectual appetite. He was strongly interested in art; and the principles of art and their relation to science was one of his favorite themes.

It is needless to say that a man so fruitful of ideas as Professor Le Conte, so happy and so forceful in their expression, was eminently successful as a lecturer and public speaker. While he rather shrank from extempore addresses he was always willing to speak on public occasions and was always in demand.

Professor Le Conte's scientific work and influence extended beyond the writing of papers and books. He entered heartily into the scientific life of the nation and took an active interest in various organizations which have for their purpose the strengthening and extending the love of science among the people. He was a member of the National Academy of Sciences, associate fellow of the American Academy of Arts and Sciences, corresponding member of the New York Academy of Sciences, member of the American Philosophical Society, fellow of the American Association for the Advancement of Science and past-president of the same, fellow of the Geological Society of America and past-president of the same, life member of the California Academy of Sciences, member of the Boston Society of Natural History, honorary member of the Brooklyn Ethical Association, member of the Iowa Academy of Sciences, member of the Davenport Academy of Sciences, member of the American Institute of Mining Engineers, member of the National Geographical Society, member of the International Geological Congress and once vice-president of the same, member of the California State Medical Society, honorary member of the South Carolina State Medical Society. He was also associated with the editorship of the *Journal of Geology* and of SCIENCE.

While Professor Le Conte, by his writings and by his active participation in the proceedings of the various societies just mentioned, had become a force in the intellectual life of the nation, this was only one element of his remarkable strength at the University of California. Here his intellectual achievements were overshadowed by the great and remarkable personality of the man. His singularly sweet and simple character seemed to seize upon all who came in contact with him and bind them to him as admiring friends. Indirection in any of its forms was utterly foreign to his nature. He was true to his ideals throughout life and his influence in the University

was always for the noblest and best in human effort. While too engrossed in his scientific and philosophic writings to take the initiative in University or public affairs, he was ever in touch with the progress of the time, and ever sympathetic and healthful in advance movements. He was of an exceptionally cheerful and happy disposition and was possessed of a fund of humor that made him a sparkling and entertaining conversationalist. He had the graces and manner and speech and chivalric instincts of a gentleman of the old southern school. He was beloved by the whole University, and with increasing years this love became a sort of veneration, so that he was in the later years of his life the veritable idol of the University community.

His death, without lingering pain, in the midst of the grand Sierra that he loved so well, surrounded by many of his friends, was a fitting close to his long life. His kindly presence and benign influence will long live in the memory of the University, and in the world of science he has certainly established for himself a monument more lasting than brass.

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AN AMERICAN SENATE OF SCIENCE.

WHEN in the course of human events the most vigorous colonies of the New World deemed it necessary to found a nation, they cast aside tradition and example and invented a system of government based on the theory of human equality. The movement opened a new chapter in the history of nations; earlier governments grew into form much as the primitive implement takes shape by continued use, but this was a distinct creation, like the complex tool invented and made for a purpose; and the fundamental theory was new in application if not in thought. The invention of the colonists was applied experimentally, and worked well; minor changes were found needful here and there in the adjustment of the mechanism to its work, yet remarkably enough the most sweeping changes led directly toward the fundamental theory of equality; and for a century and a quarter the world's first invented government has proved the world's most successful government. The device of governing by the people for the people was adopted by the component organizations with equally satisfactory results. The colonies, and after them the states, rested on the fundamental theory; the municipalities followed; counties and townships and villages adopted practice and theory together; and political organizations sprang from the theory to shape the practice of governmentation. In the smaller organizations as in the larger the governmental mechanism has worked well; difficulties have arisen, yet remarkably enough most of these have resulted from the opposition of one-man power to the theory of equal rights; and the world's most striking examples of growth in cities and States are found in numbers in the nation invented by its founders.

The essential mechanism of the invented government was that of control by equitably selected representatives. Provision for keeping the control adjusted to current needs was made by limiting tenure of office and excluding hereditary privilege; while provision against undue instability was made by arranging for the equitable selection of representatives of a second order, *i. e.*, representatives of representatives. In that branch of the government performing legislative (or constructive) functions, these representatives of representatives are organized in senates, whose powers are coordinate with those of the primary representative bodies. In general terms, the representative body is the progressive factor, the senate the conservative factor, of the body-politic; and it is the special function of the