

thanked the Ministry of Public Instruction, and greeted all who took part in the commemoration in honour of Filippo Cavolini. Commander Rodino presented a welcome from the municipality of Naples, and thanked the Italian Sovereign, patron of the commemoration. Prof. Paladino spoke on behalf of the Royal Academy of Sciences and Letters, recalling at length the personality of Cavolini as citizen and man of science. Prof. Camerano, rector of the Turin University, made an appropriate speech, and Prof. Apáthy, representing the Hungarian University of Kolozsvár, offered the greetings of the foreign men of science. Dr. F. S. Monticelli, ordinary professor of zoology at the Naples University, then delivered a speech in which, having alluded to the life of Cavolini, and summarily traced his scientific work, he concluded:—"Filippo Cavolini was a biologist in the true and modern sense of the word, both in observation and in experiment; his work marked a new direction in the study of life, a direction that has been corroborated in later times, a direction which Cavolini, in his day, professed and practised."

"The perusal of his works, which will be re-edited by the committee, fully proves that a century ago he, precursor of the present time, experimented on the same lines as those of the present day. This man, to whom, with patriotic pride, we must accord the honour of the scientific discoveries which he first revealed, well merits the remembrance of his fellow-citizens in to-day's centennial festivities, in order that they, not forgetting our ancient culture, should recollect that in times less fortunate for Italy's destiny, Filippo Cavolini, honouring his country, maintained his country's name in science."

The rector afterwards held a reception in the great academic hall. In the evening the Society of Naturalists received the delegates in the Galleria Vittoria. The following day the delegates and congressists were invited by the committee to join an excursion by steamer to Capo Posillipo, to the Villa de Mellis, once Cavolini's property. President Monticelli, in the presence of a large gathering, consigned to the representative of the municipality a commemorative marble tablet, which had been fixed to the house in which the great naturalist achieved his work.

#### JOHN WILLIS CLARK.

BY the death of John Willis Clark, on October 10, the University of Cambridge has lost one of its best known and best loved members. Failing health had quite recently induced him to send in his resignation of the office of registry of the University, as from the end of September. The interval allowed by statute for filling up this important post is only fourteen days, and it thus happened that his successor was elected on October 12, the day before his funeral took place.

J. W. Clark was to an exceptional extent a product of Cambridge, and the circumstances of his birth and training combined to give him, from early youth, an intimate knowledge of the University. He was born in Cambridge on June 24, 1833. His father, the Rev. W. Clark, fellow of Trinity College, was professor of anatomy from 1817 to 1866. His uncle, Robert Willis, fellow of Gonville and Caius College, held the Jacksonian professorship of natural experimental philosophy from 1837 to 1875. J. W. Clark was thus brought up in an environment which made him familiar with the University at an age when his contemporaries in academic standing of later years had not yet commenced their acquaintance with Cambridge. He was educated at Eton, and from there proceeded to Trinity College, of which he became a scholar, and

later a fellow, having obtained a first class in the classical tripos of 1856.

On the death of Prof. Clark, in 1866, a professorship of zoology and comparative anatomy was founded, and the first occupant of the chair was Alfred Newton. At about the same time the zoological specimens which had been contained in the museum of anatomy, some of them dating from the time of Sir Busick Harwood, professor of anatomy from 1785 to 1814, were placed in a museum of their own, reinforced by the collections of the Cambridge Philosophical Society. J. W. Clark was the first superintendent of the new museum of zoology, and he acted in that capacity from 1866 to 1891, when he resigned the office on being elected registrar. During his tenure of the superintendentship, his own efforts, combined with those of Prof. Newton and Prof. (later Sir George) Humphry, gave the museum a character which was eminently suited for the instruction of students of zoology, and made it an educational instrument of the greatest value. Throughout these years Clark was on terms of intimate friendship with Prof. (later Sir William) Flower, at that time conservator of the museum of the Royal College of Surgeons. A series of specimens illustrating the comparative anatomy of vertebrates was formed by a mutual arrangement between the two museums, of such a nature that, for instance, the limb-bones of one side of a particular animal found their way into the museum of the College of Surgeons, and those of the other side into the Cambridge comparative series. Clark was fully impressed with the importance of illustrating the structure of animals in his scheme of exhibits, and the collection over which he presided was distinguished by possessing preparations both of vertebrates and invertebrates, which placed it far in advance of the majority of provincial museums.

During the whole of his period of office at the museum, Clark had, however, wider duties to perform. He found time to act as secretary to the Museums and Lecture Rooms Syndicate, a body which is charged with the care of the buildings, and, to a large extent, with the finance of the scientific and other departments. This was a highly critical period in the history of natural science in the University, since it coincided with the remarkable growth of scientific studies which was so marked a feature of Cambridge at that time. Clark's wise and capable management of affairs, and in particular the interest he took in supervising the planning and erection of the buildings required to provide accommodation for the new studies, have earned for him the well-deserved gratitude of all who have had the scientific interests of the University at heart.

The duties in connection with the museum and with the growth of the scientific departments generally would have been enough to find full scope for the energies of an ordinary man. But this was only one side of Clark's remarkable character, and some of his most notable achievements lay in entirely different directions. His highly valued services to the University as a member of innumerable syndicates and boards must be passed over without comment. The work by which he is best known to many students was connected with the history of the University. The monumental "Architectural History of the University of Cambridge," by the late R. Willis and J. W. Clark, was published in 1886, in four large volumes. It originated in a lecture given by Prof. Willis in 1854, and it was based in the first instance on the materials which had been accumulated by him. The work was taken over by Clark at Prof. Willis's death; and the volumes, as finally brought out by him, are a mine of information in all matters con-

nected with the growth of the University and its colleges, as well as of Eton College. Four years later, in 1890, "The Life and Letters of Adam Sedgwick" was published by J. W. Clark, in collaboration with Prof. T. McKenny Hughes.

As an antiquary, Clark was specially concerned with libraries, and he was an acknowledged master in matters relating to their furniture and fittings. Some of his results in this line of investigation were published in 1901, under the title of "The Care of Books." His interest in libraries took a practical shape in the work he devoted to the University library, as shown, for instance, by his success in raising, within the last few years, a sum of 20,000*l.* in order to place the finances of that institution on a more satisfactory basis. The Fitzwilliam Museum is another institution to which Clark devoted much of his time, and to which he rendered innumerable services. He was a member of the council of the Cambridge Antiquarian Society for forty-nine years, and he read more than fifty papers at meetings of the society.

As a zoologist, Clark's principal interests were connected with marine mammals, as is exemplified by the fine collections of Cetacea, Sirenia, and Pinnipedia which he made for the museum of zoology. His best-known zoological publications refer to these groups of animals, and special reference must be made to his papers on eared seals, published in the Proceedings of the Zoological Society in 1873 to 1884.

During the last nineteen years of his life, Clark was fully occupied by the duties devolving on him as registrar of the University. In this capacity his extraordinary knowledge of the early history of Cambridge and of its forms and ceremonials, his ability in the care and publication of documents, and his acquaintance with procedure were all of the greatest service to the University.

It is difficult to speak dispassionately of Clark's singularly attractive personality, and of the ready sympathy he showed with all sorts and conditions of men.

Advancing years did not take from him the capacity of making new friends, many of whom were chosen from among the younger members of the University.

"Gracious and apt to win the youngest heart,  
Yet keep the oldest true!"

These words, written of him by his friend, Mr. A. C. Benson, will express the affectionate regard felt for him by many with whom his loss leaves a blank that cannot be filled. SIDNEY F. HARMER.

#### PROF MAURICE LÉVY.

IN NATURE of last week the death was announced of M. Maurice Lévy, sometime inspector-general of the Ponts et Chaussées, and professor at the Collège de France. An interesting account of Lévy's investigations in pure and applied mathematics and mechanics is given by M. Émile Picard in an address to the Académie des Sciences, read on October 3 (*Comptes rendus*, cli., 14).

In infinitesimal geometry, Lévy obtained the doctorate in 1867, for an essay on orthogonal coordinates embodying several new and important results. His investigations in this subject also included the study of spiral surfaces. His treatise on graphical statics, of which the first edition appeared in 1874, practically initiated the study of this important branch of applied mathematics in France. The notes at the end of the first edition really constitute original papers on the tension of elastic rods, and on the systems of maximum strength with given amount of material; in them the author discusses the advantages of structures without superfluous connections. A second and en-

larged edition appeared in due course, and the completion of a third edition has been unfortunately cut short by Lévy's recent death.

The subject of elasticity occupied a large share—perhaps the main share—of Lévy's attention. After he entered the École polytechnique in 1856, at the age of eighteen, he indicated a new and simple method of investigating the resistance of continuous beams. The problems presented by systems, one of the dimensions of which is small compared with the others, greatly interested him, and a long memoir was published by him on the flexure of elastic plates. M. Picard speaks in high terms of the ingenuity and ability displayed in this essay, while remarking that a more complete solution of the difficulties occurring in this problem is to be sought elsewhere.

A second problem in elasticity was afforded by the stability of rods or prisms under end-thrust, and Lévy extended the investigation from straight to circular rods, obtaining extremely interesting conditions of stability by means of an analysis involving elliptic functions. To M. Lévy is assigned the credit also of obtaining for the first time the general equations for ductile bodies strained beyond the limits of elasticity, thus responding to the question put by Saint Venant, arising out of Tresca's experiments.

Hydrodynamics formed the subject of Lévy's second paper, dealing with rectilinear vortex motion. In this, the author took a leaf out of Cauchy's theory of optical dispersion in his application of the higher differential coefficients in studying the mutual action of two vortices.

A development of a more practical character was M. Lévy's investigation of the equilibrium of earth and the strength of masonry supporting walls. Starting with the laws of friction, Lévy found the differential equation of the lines of rupture in limiting equilibrium, and showed that, contrary to Coulomb's results, the surfaces of rupture for a prismatic mass of earth are not in all cases planes parallel to the edges of the prism.

It will thus be seen that M. Lévy played an important part in applying analytical methods to the solution of problems of practical interest, and his works constitute a heritage from which workers in applied science cannot fail to benefit greatly.

#### NOTES.

THE council of the Royal Scottish Geographical Society has resolved to award the society's medal to Prof. James Geikie, F.R.S., for his numerous contributions to geographical research and his great services to the society; and the Livingstone gold medal to Sir John Murray, K.C.B., F.R.S., in recognition of his oceanographical work, and more particularly in commemoration of the completion of the bathymetrical survey of Scottish fresh-water lochs.

WE regret to see the announcement of the death, on October 14, of Dr. Sydney Ringer, F.R.S., at seventy-six years of age.

ACCORDING to a Reuter message from Santiago de Chile, official returns show that the world's consumption of nitrate during the past year amounted to 43,996,966 quintals, an increase of 8,000,000 quintals as compared with the previous twelve months.

PROF. HOWARD C. BUTLER, of Princeton, has just returned to that University with an encouraging report of the archæological expedition he has been directing at Sardis, in Asia Minor. The discoveries include a part of the pavement of the ancient city, and the substructure of a large temple of the fourth century B.C. In the necro-