

of the earth during its solidification, but he does not explain why these reservoirs are arranged in chains or lines. With a few words respecting the part that radio-activity and the expansion of silicates in solidification may play in connection with volcanic action, the writer points to these various theories as indications of the uncertain and contradictory knowledge we possess respecting such phenomena. After a brief *résumé* of the investigations to be carried out at the new institute, the author tells his readers that the International Institute of Weights and Measures at Paris, that of Seismology at Strasburg, and that of Agriculture at Rome, have conferred upon those cities a great prestige. In like manner an International Institute of Vulcanology will be a new glory for Italy and for Naples.

J. M.

THE ARCHÆOLOGICAL DEPARTMENT OF INDIA.

LORD CURZON has done good service to the cause of archæology by his spirited protest published in *The Times* of October 7 against the change of system in regard to the ancient monuments of the country proposed by the Government of India. Up to the time when, as Governor-General, the attention of Lord Curzon was directed to this question, the State policy in connection with the excavation of sites of historical interest and the conservation of the Buddhist, Hindu, and Mahomedan religious and civil buildings was ill-considered and ineffectual. In the early days of our rule these buildings, which are due to the munificence of vanished dynasties or the religious devotion of their subjects, were usually neglected and often desecrated. Excavations were undertaken by unskilled workers in a haphazard way, and many objects of interest and value were lost or destroyed. Under General Cunningham as director, between 1870 and 1885, some useful excavations were carried out. But the result of the work as a whole was not commensurate with the expense which had been incurred.

When Lord Curzon took up the question in 1902, the department was reorganised under Mr. J. H. Marshall, a good scholar and competent archæologist, as director-general. Lord Curzon quotes many examples to show the urgent necessity of this course of action. At Lahore the exquisite Pearl Mosque had been converted into a Government treasury, the Audience Hall into a barrack, the Sleeping Hall of Shah Jahan into a church. The beautiful mosque at Ahmedabad was used as a revenue office; the pavilion at Selimgarh in the Agra Fort as a canteen; the marble pavilion of Shah Jahan at Ajmer as the Commissioner's dining-room; a fine mosque at Lahore as the office of the railway traffic superintendent; one at Mijapur as a *dâk* bungalow, another as a post-office; the gilded palace at Mandalay had been utilised partly as a church, partly as a clubhouse.

Under the new system such destruction and desecration were discontinued. Many beautiful buildings have been tenderly repaired. Museums have been opened at the chief historical cities, and whenever excavations have been conducted the scientific principles established by the work of Prof. Flinders Petrie in Egypt, the British School at Athens, and in many other places, have been followed. Mr. Marshall has published a series of progress reports which have been received with admiration by scholars in Europe and America.

Now it is proposed, from some petty considerations of economy, to bring to a close this admirable work, which costs 30,000*l.* per annum out of a revenue of

eighty millions. The control of the head archæologist is to cease, and the provincial governments are to start again the inefficient methods of which we have had disastrous experience. These governments are habitually pressed for funds, and they neither possess nor can employ a staff competent to undertake the care of the ancient buildings or to conduct excavations.

Now that this proposed change of policy has been brought to the knowledge of the scientific world by the one man competent to express an opinion on such a subject, the result cannot be doubtful. The indignant protests of archæologists throughout Europe and America must compel the Indian Government to abandon these ill-considered proposals. It will be a bad omen for the future administration of India if, in the year when his Majesty the King-Emperor visits the country, a scheme which has commended itself not only to archæologists, but to the princes and rulers of India, is suddenly, without adequate reason, brought to an end, and the old system of neglect and maladministration re-established.

LOUIS JOSEPH TROOST.

BY the death of Troost, on September 30, at the ripe age of eighty-five, France loses the last surviving member of that group of workers—pupils of Henri Sainte-Claire Deville at the *École Normale*—who created, mainly under his inspiration and leadership, what was practically a new department of chemical science. Thermal chemistry, as we understand it to-day, may be said to have originated in mid-Victorian times. It may be urged that the relations of chemistry to heat are so intimate that the study of these relations is necessarily as old as the study of chemistry itself. But it was only at the beginning of the latter half of the last century that the subject of thermal chemistry was attacked. Systematically, and for the most part in France, at the instigation of Deville, who, with the aid of Troost, Debray, Isambert, Hautefeuille, and Ditte, laid the foundations of that imposing superstructure to which this special department of knowledge has now attained.

Troost, who was born in 1825, was educated at the *Lycée Charlemagne*. He entered the *École Normale* in 1848, becoming an assistant there in 1851, and receiving his doctorate of science in 1857. For some time he taught in the provinces, but ultimately took charge of the chair of chemistry at the *Lycée Bonaparte* at Paris, and then, in 1868, became *Maitre de Conférences* at the *École Normale*. In 1874 he became a professor in the faculty of sciences of Paris, where he remained until 1900, when he retired. In 1884 he succeeded Wurtz at the Academy of Sciences. For many years he was a commander of the Legion of Honour.

Troost was an indefatigable experimentalist and a prolific writer. His published memoirs, either alone or in association with Deville, Marie-Davy, and Hautefeuille, number close upon a hundred. His earliest essays were in pure inorganic chemistry: he prepared and studied the salts of lithium, which, in the middle of the nineteenth century, was regarded as a rare element. By the student, however, Troost is mainly remembered by reason of his work with Deville on the determination of vapour densities at high temperatures, the study of which had received an enormous impetus on account of the applications of the doctrines of Avogadro and Ampère. The values so obtained have become classical and are to be found in practically every systematic treatise of chemistry. With Deville, he largely developed the conception of dis-

sociation, and his memoir on the vapour density of chloral hydrate gave rise to a memorable controversy on the value of volumetric considerations in the determination of equivalents. In conjunction with Hautefeuille he followed Debray in elucidating the laws governing dissociation, the recognition of the fundamental phenomena of which we owe to Deville. In this connection we may cite the memoirs on the conditions determining the absorption of hydrogen by palladium, potassium, and sodium, the dissociation of the sesquichloride of silicon, and the transformations of cyanogen into paracyanogen, and of cyanic acid into cyanuric acid. With Deville he studied the porosity of metals at high temperatures, and with Hautefeuille the solubility of gases in metals.

Troost was a frequent contributor to metallurgical chemistry, and made important contributions to our knowledge of the parts played by silicon and manganese in determining the physical properties of the various forms of commercial iron. His treatise of chemistry, which originated out of his connection with the Sorbonne, has gone through innumerable editions, and for many years past has been a standard text-book to successive generations of pupils.

Troost, in spite of his advanced years, enjoyed excellent health up to a short time before his death. He preserved his faculties practically unimpaired, and was active and industrious to the last on the numerous commissions in which he took part, and more particularly on the Commission des Inventions at the Ministry of War, of which he had been president for some years past.

NOTES.

WE notice with regret the announcement of the death, on October 7, of Dr. J. Hughlings Jackson, F.R.S., consulting physician to the London Hospital, at seventy-six years of age.

THE Decimal Association announces that a weights and measures law, rendering the use of the metric system compulsory in Bosnia-Herzegovina, will come into force on September 1, 1912.

THE Harveian oration will be delivered by Dr. C. Theodore Williams at the Royal College of Physicians of London on Wednesday next, October 18.

RECENT progress in model or small-power engineering, both as a hobby and as a useful factor in technical education, will be demonstrated at the Model Engineer Exhibition—the third of its kind—to be held at the Royal Horticultural Hall, Westminster, on October 13–21.

WE notice with regret that the death is announced, on September 25, in his sixty-eighth year, of Prof. Auguste Michel-Lévy, the distinguished geologist and member of the Paris Academy of Sciences.

THE *Terra Nova* of Captain Scott's British Antarctic Expedition returned safely to Lyttelton, N.Z., on October 7. Lieut. Filchner, the leader of the German South Polar Expedition, left Buenos Aires a few days ago for the Antarctic in the *Deutschland*. It is announced from Sydney that the fund for Dr. Mawson's Antarctic Expedition now amounts to 43,000*l.*

DR. J. H. H. TEALL, F.R.S., director of H.M. Geological Survey, will take the chair at the first of the Selborne lectures of the season, to be held on Monday, October 16. The subject will be "The Evolution of Scenery," and the lecturer Mr. F. W. Rudler.

DR. W. E. ADENEY, of Dublin, who has devoted particular attention to questions of sewage pollution, has been

invited by the Metropolitan Sewage Commission of New York to advise it in reference to the over-pollution of the waters of the harbour of that city. Dr. Adeny served as a member of the recent "Whisky Commission."

DR. WILHELM DILTHEY, whose death is announced at the advanced age of seventy-seven, was professor of philosophy at the University of Berlin until 1905, when he resigned owing to ill-health. He held his chair as successor to Lotze, and had previously been professor of philosophy in Basel, Kiel, and Breslau. Although, perhaps, best known for his "Leben Schleiermachers," which brought him into notice in 1870, he published a number of other essays and books, some of which are of considerable philosophical importance.

IN connection with the Exhibition of British Fisheries, &c., at Manchester, which was opened on Saturday, October 7, by his Excellency the Greek Minister, the Hull Museums Committee has an extensive exhibit of old whaling appliances, paintings, models, &c., of the old whaling ships. Mr. T. Sheppard, the curator, has issued an illustrated guide to the collection (32 pages, one penny) which is a useful account of the various weapons and tools used by the old Hull whalers. It is interesting to learn that both the present enormous fishing and oil industries at Hull have developed from the whaling trade.

THE fifty-seventh report of the Postmaster-General on the Post Office, which has just been issued as a Blue-book (Cd. 5868), records that the number of radio-telegrams dealt with showed a satisfactory increase, the outward messages to ships reaching a total of 5640, as compared with 3266 in 1909–10, and inward messages from ships 34,161, as compared with 27,727, the total increase being 8808, or 28.4 per cent. During the year 97 licences, covering 107 land stations, were granted under the Wireless Telegraphy Act, and, with one exception, these were for experimental purposes. Connected with this subject, we notice the announcement in *The Morning Post* that the wireless telegraph station at Spitsbergen is now completed and ready for use. The machinery is working satisfactorily, and messages are received at Spitsbergen from Poldhu, in Cornwall, and communication is being established with the station at Ingö, in the north of Norway.

COAL is said to have been discovered on the estate of Sir Harry Verney, Bart., at Calvert, in Buckinghamshire, within fifty miles of London. It appears that exploratory work has been carried on intermittently for several years at this locality, and that a boring, which was sunk six years ago in quest of water, encountered coal-gas under pressure of about 60 lb. per square inch at a depth of 470 feet. Two bore-holes are now being sunk, and it is announced that one of them, after passing through an outburst of gas, reached coal at a depth of only 530 feet from the surface. Should this announcement be confirmed, it will justify the belief of those who hold that concealed coalfields may exist at workable depths between the Midland fields and those of Bristol and Somerset. So far back as 1877 a famous boring at Burford, in Oxfordshire, struck Coal-measures at a depth of 1184 feet, beneath a cover of Jurassic and Triassic rocks. At Batsford, in Gloucestershire, Coal-measures have likewise been found beneath Secondary strata.

At the monthly meeting of the Pharmaceutical Society, held on October 4, the president, Mr. C. B. Allen, handed the Hanbury gold medal and a cheque for 50*l.* to M. Eugène Léger, of Paris. The Hanbury gold medal is competed for every two years, and the winner receives also