

doing of the same external work for every successive unit-length of the lifting-height will require a larger sum of contractile forces than for every earlier one, since the muscle, even with progressive contraction, varies as to its elastic properties in the direction of an increase of its extensibility. Upon the weight hung to the muscle act, when contraction occurs, both the contractile and the elastic forces of the muscle. . . . In the sum ( $c + e$ ) of the contractile ( $c$ ) and the elastic forces ( $e$ ),  $e$  becomes at first (during the contraction) smaller, with the natural unweighted length of the muscle equal to *nil*, and later, even negative. If the weight, then, be lifted a number of units of length, the value of  $c$  must increase with increasing contraction. . . . But an increase of the contractile force is only possible through increased transformation of elasticity into *vis viva*, that is, through exchange of material, which finds its expression in the increased formation of heat which I have observed. Thus, if I mistake not, the facts discovered by me connect themselves with other relations already known, and will find their application in a future theory of muscular forces."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—It is stated that the Home Secretary has appointed as joint secretaries to the Oxford University Commission the Rev. Thomas Vere Bayne, Censor and Student of Christ Church, and Thomas Francis Dallin, late Fellow of Queen's College, and Public Orator of the University of Oxford.

CAMBRIDGE.—The death is announced of Dr. Geldart, Master of Trinity Hall, Cambridge, in the eighty-first year of his age. He had held the mastership twenty-five years, having succeeded Sir Herbert Jenner Fust. Dr. Geldart graduated as seventeenth wrangler in 1818.

LONDON.—Besides those already announced, the Rev. J. F. Blake and Mr. Lebour are, we believe, candidates for the vacant geological chair in University College.

NOTTINGHAM.—The ceremony of laying the foundation-stone of the University buildings at Nottingham has been fixed for Thursday, the 27th inst. The ceremony will be performed at noon by the Mayor, and subsequently there will be a public luncheon in the Albert Hall, at which Mr. Gladstone is expected to be present. The cost of the buildings, including the land, will be 60,000*l.* Of this sum an anonymous donor has contributed 10,000*l.*, and the remainder will be found by the Corporation, who have given the site. There will be lecture and class-rooms for the promotion of the Cambridge University Extension Scheme, which, it will be remembered, was first incorporated at Nottingham, and which has since been carried out successfully in several centres of industry. There will also be class-rooms, laboratory, &c., for the use of the students in the science classes in connection with the local Mechanics' Institution, as well as rooms for the Free Library and the Natural History Museum.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, September 10.—M. Peligot in the chair.—Experimental researches on the mechanism of the formation of sugar in the liver, by M. Cl. Bernard.—Referring to the preceding paper, M. A. Trécul then read a treatise on the formation of starch and of cellulose in plants.—M. Th. du Moncel then presented to the Academy a copy of his "Recherches sur les meilleures conditions des électro-aimants."—On the variation of atmospheric pressure at different altitudes, determined at the Puy-de-Dôme Observatory, during the cyclones of last winter, by M. Alluard. The author found, on comparing the barometrical readings at the Puy-de-Dôme Observatory with those of Clermont Observatory, that the most remarkable discrepancies existed, the barometer having frequently risen several millimetres at Clermont, when at the same time it fell considerably on the Puy-de-Dôme. He asks whether the supposition is justified that, while a cyclone passes over the land, other smaller cyclones are situated inside of it and remain at different heights, without reaching the ground? Or does the strange phenomenon result from local reasons which appertain to the relief of the Dôme's chain and to the relative position of the two observa-

tories? In all cases this phenomenon shows the necessity of studying the atmosphere in different layers and the great importance of the Puy-de-Dôme Observatory.—On a process of preserving the flesh of fish (extract from a note), by M. R. M. d'Amélio.—On the presence of phylloxera in the department of Loir-et-Cher, by M. J. Duplessis. The writer has found that the pernicious insect has now penetrated as far as Villebarron, and the district infested near Orleans now has the shape of a vast equilateral triangle of 60 kilometres side.—M. Ed. Prillieux then read a note on the causes which have brought about the invasion of phylloxera into the Vendôme district.—M. J. Maistre in a letter to M. Dumas speaks of the effects of sulphocarbonates against the insects.—The Minister for Agriculture and Commerce wrote a letter to M. Dumas on the same subject.—M. Faye then drew the attention of the Academy to some interesting results obtained at Washington Observatory by the observation of the two satellites of Mars recently discovered. It appears from a communication made by Admiral J. Rodgers, that in the telegram first sent to Europe by the Smithsonian Institution at Washington there was a mistake, viz., in ascribing to the inner satellite a distance of fifty seconds; half of the major axis of its orbit amounts only to thirty-three seconds of arc.—A letter was then read by the president from M. Ch. Lamey on some observations he made during the winter of 1864-65, and which caused him to believe that Mars is surrounded by a ring of asteroids of all sizes, and as a whole resembling, in some respects, the ring of Saturn. M. Lamey had observed an uncertain reddish light on each side of the disk of the planet and corresponding nearly to its equator. He directs the attention of the observers of the two new satellites to this phenomenon.—M. Leverrier then announced the discovery of another new planet in the zone between Jupiter and Mars, by Mr. Watson, at Ann Arbor, on the 3rd instant, R. A. 23<sup>h</sup> 10<sup>m</sup>. Dec. + 0° 45'. Daily motion in R. A. 55s; in Decl. - 1'; magnitude 11.—On the theory of the small motions of a weighty point on a fixed surface which is described round a vertical axis of revolution, by J. Boussinesq.—On locomotives of the compound system, by M. A. Mallet.—On the specific heat and the melting heat of platinum, by M. J. Violle. In the course of experiments made by this gentleman he found the true melting-point of pure silver at 954° C.—A note by M. V. Neyreneuf on the specific induction power.—On nitroso-guanidine, by M. Joussetin.—On the methods which the ancients must have employed to lift and transport the great Celtic or Gallic monoliths, by M. E. Robert.—A note by M. L. Hugo on some curves representing certain elements of the planetary system.

CONTENTS

PAGE

THE WORK OF THE IRON AND STEEL INSTITUTE . . . . .	433
COHN'S BIOLOGY OF PLANTS. By Prof. W. R. McNAB . . . . .	435
OUR BOOK SHELF:—	
Mackay's "Physiography and Physical Geography" . . . . .	437
Fisher's "Book of Algebra" . . . . .	437
"Bulletin of the United States Geological and Geographical Survey of the Territories."—A. G. BUTLER . . . . .	437
LETTERS TO THE EDITOR:—	
Temperature of Moon's Surface.—The EARL OF ROSSE, F.R.S. . . . .	438
Rainfall and Sun-Spots in India.—E. D. ARCHIBALD . . . . .	438
The Australian Monotremes.—P. L. S.; W. A. FORBES . . . . .	439
English Names of Wild Flowers and Plants.—J. WILLIS . . . . .	439
Some of the Troubles of John O'Toole respecting Potential Energy.—X. . . . .	439
On the Supposed Action of Light on Combustion.—C. SAVARY . . . . .	441
OUR ASTRONOMICAL COLUMN:—	
The Satellites of Mars . . . . .	441
The Satellite of Neptune . . . . .	441
The Binary Centauri . . . . .	441
Meteoritic Astronomy . . . . .	441
A New Comet . . . . .	442
CHEMICAL NOTES:—	
Action of Organic Substances increasing the Sensitiveness of certain Silver Salts . . . . .	442
Heat of Combustion of Oxygen and Hydrogen in Closed Vessels . . . . .	442
On Vapour Volumes in Relation to Avogadro's Law . . . . .	442
Chemical Constitution of the Minerals Hachetolite and Samarskite, from North Carolina . . . . .	442
On a New Class of Bodies termed Platioidinitrites . . . . .	442
A New Acid . . . . .	442
REMARKABLE PLANTS, IV.—THE BLUE GUM TREE ( <i>Eucalyptus globulus</i> , Labil.) (With Illustration) . . . . .	443
MANTEGAZZA ON THE RELATIVE LENGTHS OF THE INDEX AND "RING" FINGERS. By J. C. GALTON . . . . .	444
NOTES . . . . .	445
INTRODUCTION AND SUCCESSION OF VERTEBRATE LIFE IN AMERICA . . . . .	448
ON NOCTURNAL INCREASE OF TEMPERATURE WITH ELEVATION. By JAMES GLAISHER, F.R.S. . . . .	450
THE HEAT PHENOMENA ACCOMPANYING MUSCULAR ACTION . . . . .	451
UNIVERSITY AND EDUCATIONAL INTELLIGENCE . . . . .	452
SOCIETIES AND ACADEMIES . . . . .	452