geologically old-fashioned peninsular portion of India. Water, the great agent of denudation, has, by its chemical and physical action, been the cause of the landslip at Gohna, but the effects of the potential energy accumulating in the lake have to be patiency awaited.

SCIENCE IN THE MAGAZINES.

IN the *Fortnightly* Prof. Karl Pearson heads a forcible article on "Socialism and Natural Selection" with the following quotation from Darwin:—"What a foolish idea seems to prevail . . . on the connection between Socialism and Evolution through Natural Selection." His contribution is a diatribe against the views set forth by Mr. Kidd in "Social Evolution" and the reviewers who have hailed the work as scientific in its construction and conclusions. Dr. Louis Robinson points out the glaring moral inconsistency of the majority of anti-vivisectionists, who "while they claim to be actuated by the great principle that kindness to all living creatures should be a rule from which only the direst necessity can excuse us . . . are content to ignore the cruelties which are most wanton, most severe, and most frequently inflicted. Moreover, this strange callousness to the great mass of animal suffering is not deemed inconsistent with a frenzied onslaught on the practice of experimenting upon animals in the interest of medical science, although such experiments are deemed absolutely needful by nearly all those who know anything at all about the subject, and although the pain so caused is but as a drop in the ocean when compared with that inflicted in sport, or for monetary profit. . . . . Now what would all the good humanitarians say, if some man of science, pursuing knowledge rather than pleasure, were deliberately to smash the leg of an animal, and lacerate its flesh with some blunt instrument, and merely to save himself a little trouble, were to let it crawl about the laboratory, with a compound fracture and wounds unattended to, while he busied himself with something else? What, if he were to commence an operation on a pigeon by wrenching off a wing and gouging out an eye, and then were to stroll off to lunch, and a game of billiards, intending to come back and finish the business when he had leisure? What if he were to tear open the abdominal cavity of a rabbit, and, rather than spend a quarter of an hour in completing the operation he had begun, were callously to let it die in all the unspeakable agonies of peritonitis? What, again, would they say if, when the vicar dropped in to afternoon tea and asked about the result of the experiments, our investigator were to smile and rub his guilty hands as he replied that he had had a most enjoyable morning? And, lastly, what would they say about the vicar if on hearing this shameless avowal he joined in the abominable rejoicings of his host, and accepted a gift of the mangled carcases of the victims?"

The *Contemporary* contains a reply by Prof. Bonney to Dr. Wallace's arguments in favour of the excavation of lake basins by glaciers (*Fortnightly*, Nov. and Dec. 1893). Prof. Bonney winds up by saying: "Notwithstanding Dr. Wallace's ingenious advocacy of the erosive power of glaciers and ice-sheets, I maintain that these can excavate only under the most favourable conditions, and then but to a limited extent, and that they are proved by a close study of the Alpine peaks and valleys to have been incapable of hollowing out the great lakes of that chain."

Dr. Carl Lumholtz has been for the past three years making explorations in the almost unknown regions of the Sierra Madre in Mexico. The first of a series of papers on his discoveries appears in *Scribner's Magazine* under the title, "Among the Tarahumaris." The paper is profusely illustrated from photographs taken by the author. The following extracts are of interest:—

"Cave-dwellers are found among the following tribes, counting from the north: The southern Pimas, the Tarahumaris, and the allied tribe of Huarogios, and the Tepehuanes. All these tribes inhabit the State of Chihuahua and are more or less mountaineers living almost entirely in the great Sierra Madre range. Of these people the Tarahumaris are most attached to caves, the Tepehuanes the least. All are linguistically related. In some of their customs and manners they also greatly resemble each other, while in others, as well as in character, they are strikingly different. Very little that may be called accurate was known of these tribes. The Tarahumaris, the most primitive of them and the least affected by Mexican civilisation, are the most interesting."

As to the relation of these people to the cliff-dwellers of the south-west, Dr. Lumholtz remarks: "Are the cave-dwellers related to the ancient cliff-dwellers of the south-western part of the United States and northern Mexico? Decidedly not. Their very aversion to living more than one family in a cave, and their lack of sociability, marks a strong contrast with the ancient cliff-dwellers who were by nature gregarious. The fact that people live in caves is in itself extremely interesting, but this alone does not prove any connection between them and the ancient cliff-dwellers. Although the Tarahumari is very intelligent, he is backward in the arts and industries. His pottery is exceedingly crude, as compared with the work found in the old cliff-dwellings, and its decoration is infantile as contrasted with the cliff-dwellers' work. The cliff-dwellers brought the art of decoration to a comparatively high state, as shown in the relics found in their dwellings. But the cave-dweller of to-day shows no suggestion of such skill. Moreover, he is utterly devoid of the architectural gift, which resulted in the remarkable rock structures of the early cliff-dwellers. These people, so far as concerns their cave-dwelling habits, cannot be ranked above troglodytes."

Prof. N. S. Shaler, of Harvard, continues his popular studies of domestic animals with a paper on "Beasts of Burden," showing the great part they have played in the civilisation of man. The article is richly illustrated.

A chatty article on British vipers is contributed to *Chambers's* by Dr. A. Stradling. This journal also contains "Wintering on Ben Nevis," by Mr. R. C. Mossman, being a description of meteorological phenomena observed during a winter's exile in the Ben Nevis Observatory. We also note a description of some of the methods adopted by the modern pharmaceutist to make the medicines he dispenses less objectionable than formerly; an article on diamonds, and others on recent developments of photography, "The Sleep of Plants," and "Nest-building Insects."

Sir Henry Roscoe writes on "The New Education" in the *Humanitarian*, and states in his article what is being done in the way of technical instruction. The same journal is the arena of a more or less heated discussion on vivisection. Lady Burton expatiates upon "The Position of Animals in the Scale of Nature," and Dr. E. Berdoe replies to Prof. Victor Horsley's criticisms which appeared in the June number. Lady Burton suggests that criminals sentenced to death should be given the option of being experimented upon or of dying a felon's death. The same idea has been put forward by another writer. In the *Sunday Magazine* we find a concluding article on "The Stuff we are made of," by Dr. J. M. Hobson.

Sir Robert Ball must have a rather poor opinion of the readers of *Cassell's Family Magazine*, or he would not offer them such "an old, old story" as that he tells in "A Talk about the Pleiades." A few remarks on the visibility of stars in the cluster are followed by some trite conclusions upon the gregarious character of the proper motions, a vague statement as to the spectra of the components, and a description of the photography of the group. All this is illustrated by two cuts from one of the author's books and a reproduction of the plate based upon the photograph taken by the Brothers Henry some years ago. Nothing but the author's reputation would have secured the insertion of such a commonplace contribution. An article of a better stamp is his sketch of the life of Sir William Herschel in *Good Words*, being the third of a series on "The Great Astronomers." This series is evidently intended to be published in book form when completed. Misconception will certainly result, however, from the description of the discovery of Uranus. From Sir Robert Ball's account, readers are led to believe that Herschel knew that the object that came within his ken in March 1782 was a planet, as soon as he had found that it was a disc capable of magnification. But it is well known that Herschel thought the object was a comet; in fact, he announced his discovery as cometary, and it was not until some months later that its planetary nature was established by considerations of the orbit it pursued. We would, therefore, suggest to the learned Lowndean professor that he would do well to modify the following statement—"Great then was the astonishment of the scientific world when the Bath organist announced his discovery that the five planets which had been known from all antiquity must now admit the company of a sixth."

The *Century* contains the third part of "Across Asia on a

Bicycle" by Messrs. T. G. Allen and W. L. Sachtleben, an article on "Coasting by Sorrento and Amalfi," and one on "The Highroad from Salerno to Sorrento," all of them being well illustrated.

In addition to the magazines named in the foregoing, we have received *Longman's*, containing "Polar Bear Shooting on the East Coast of Greenland," by Dr. Nansen, and "Chamois Hunting above the Snow Line," by Mr. Hugh E. M. Stutfield.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The following are the speeches delivered by the Public Orator, Dr. Sandys, Fellow and Tutor of St. John's, on June 27, in presenting Sir John Bennet Lawes, Bart., F.R.S., Sir Joseph Henry Gilbert, F.R.S., and Prof. Mendeléef, for the honorary degree of Doctor in Science:—

(1) Salutamus tandem par nobile collegarum qui de agrorum cultura, de pecudum alimentis variis, experimentis exquisitis una elaborandis annos quinquaginta, magnum profecto aetatis humanae spatium, dedicarunt. Tot annorum autem labores non modo chartae fideles in perpetuum custodient, sed etiam saxum ingens nomine utroque insculptum inter posteros testabitur. Ab ipso autem "monumentum aere perennius" erit exactum, experimentis tam utilibus, tam fructuosis, munificentia ipsius etiam in posterum continuatis. Auguramur, nec nos fallit augurium, in agri culturae annalibus talium virorum nomina fore immortalia.

Duco ad vos Baronettum insignem, Regiae societatis socium, virum doctoris titulo bis aliunde merito ornatum, IOANNEM BENNET LAWES.

(2) Quos tot annorum labores una coniunxerunt, eos in laudibus nostris hodie divellere vix possumus. Constat tamen labores illos viri huiusce scientiae admirabili et industriae indefessae plurimum debere. Constat eosdem eiusdem scriptis, eiusdem orationibus, non modo in patria nostra sed etiam peregre maximo cum fructu esse patefactos. Cum collega suo summa concordia coniunctus, Plinii verba iure optimo posset usurpare: "nobis erat nullum certamen, nulla contentio, cum uterque pari iugo non pro se, sed pro causa niteretur."

"Felices ter et amplius
quos irrupta tenet copula."

Duco ad vos Regiae societatis socium, virum ab ipsa Regina equitem propter merita nominatum, IOSEPHUM HENRICUM GILBERT.

(3) In scientia chemica investiganda diu inter peritos quaerebatur, quaenam ratio interesset inter atomorum pondera e quibus rerum elementa constarent et vires eas, sive chemicas sive physicas, quae elementis ipsis velut propriae inhaererent. Qua in ratione penitus perscrutanda atque ad certam quandam legem redigenda nemo plura perfecisse existimatur quam vir illustris qui Siberia in remota natus, et undecim abhinc annos a societate Regia Londinensi numismate aureo donatus, hodie nostra corona qualicumque decoratur. Magnum profecto est inter tot elementa rationem certis intervallis velut circuitu quodam recurrentem observasse, eque rerum notarum observatione etiam ignota providisse. Viri huiusce ingenio etiam elementa prius inaudita mentis divinatione singulari praedicta sunt posteaque in ipsa rerum natura reperta. Quae elementa, trium gentium insignium nominibus Gallium, Scandium, Germanium nuncupata, nomen ipsius illustrius reddiderunt et Russorum famam, quantum ad ipsum attinet, feliciter auxerunt. Ergo virum de scientia chemica tam diu tamque praeclare meritum, totque titulis aliunde ornatum, hodie etiam nostrorum

"turba Quiritium
certat tergeminis tollere honoribus."

Newtoni certe in Academia honos ei praesertim debetur, qui etiam in scientia chemica Newtoni in vestigiis tam fideliter insistit, ut alumni nostri "qui genus humanum ingenio superavit" imaginem intuens, Lucreti verba paululum mutata possit usurpare:—

"te sequor, o Grantae magnum decus, inque tuis nunc
ficta pedum pono pressis vestigia signis."

Duco ad vos scientiae chemicae professorem Petroburgensem, DEMETRIUM IVANOVITCH MENDELEEF.

SCIENTIFIC SERIALS.

American Journal of Science, June.—Notes from the Bermudas, by Alexander Agassiz. The story of their present condition is practically that of the Bahamas, with the exception that at the Bermudas we have an epitome, as it were, of the physical changes undergone by the Bahamas. The development of the true reef builders, of the massive corals, is insignificant. Subsidence has brought about the existing outlines of the islands, but there is no evidence to show that the original annular coral reef was formed during subsidence. That reef has disappeared, and nothing is left of it except the remnants of the æolian ledges extending to sixteen or seventeen fathoms outside the reef ledge flats, ledges which owe their existence to the material derived from it: the former æolian hills of the proto-bermudian land.—Discovery of Devonian rocks in California, by J. S. Diller and Charles Schuchert. During the field seasons of 1884 and 1893, the U.S. Geological Survey acquired six lots of Devonian fossils, comprising about thirty species, mostly corals. They demonstrate the undoubted presence of middle Devonian deposits in California, where rocks of this age have long been looked for by geologists, more particularly since the recent discovery of Silurian fossils.—New method of determining the relative affinities of certain acids, by M. Carey Lea. This method is based on the principle that the affinity of any acid is proportional to the amount of base which it can retain in the presence of a strong acid selected as a standard of comparison for all acids. When to free sulphuric acid a salt is added in sufficient quantity to cause the whole of the sulphuric acid to saturate itself with the salt base, it is possible by means of the herapathite test to determine the exact point of such saturation. From this we can deduce the exact nature of the resulting equilibrium. A series of equilibria thus obtained with different salts enables us to determine the comparative strength of the affinities of the acids of these salts. The fact that even small quantities of weak acids added to sulphates will set free a certain quantity of sulphuric acid, can be rendered visible to the eye by a well-marked chemical reaction.—A recent analysis of Pele's Hair and a stalagmite from the lava caves of Kilauea, by A. H. Phillips. The stalagmite is of the kind characteristic of the lava caverns of Kilauea, differing very slightly from Pele's Hair in constitution, but widely from ordinary stalagmites formed by undoubted solution. They are suggestive of fused drops, which falling one on the other are at the time sufficiently plastic to be quite firmly welded together and congealed in a slightly drooping position.

Bulletin of the New York Mathematical Society, vol. iii. No. 8, May 1894. (New York: Macmillan.)—"Utility of quaternions in physics" is an analysis by Prof. A. S. Hathaway of A. McAulay's essay, which is well known to our readers (see NATURE, December 28, 1893, amongst other references). The reviewer considers it to be "of undoubted scientific value, and the work of a man of genuine power and originality," and that it will go far towards accomplishing the author's purpose of arousing serious interest in quaternion analysis.—Prof. Eneström, in a note upon the history of the rules of convergence in the eighteenth century, calls attention to two other mathematicians, in addition to those named in a notice by Prof. Cajori, in vol. ii. pp. 1–10, viz. Maclaurin and Stirling: for the former he claims "a signal place in the history of these rules."—Prof. F. Franklin concisely abstracts Dr. Franz Meyer's "Bericht über den gegenwärtigen Stand der Invariententheorie," a work which gives a remarkably full abstract of researches in the domain of algebraic forms and Invariants.—Cajori's "History of Mathematics" (pp. 190–197) is a work which Prof. D. E. Smith submits to a searching examination, the commencement of which is a severe condemnation of great part of the book, founded on a side by side comparision of Cajori's statements with those of previous writers on the subject, which he is alleged to have copied without giving due credit to the authors cited. He states the book to be weak in bibliography, and carelessly written. Its merits are that it tells the general story of the growth of mathematics in a popular way, is well printed and "altogether an attractive piece of book-making." Not having seen the work we cannot say if this witness is true, but he certainly adduces evidence which it will be hard to rebut.—"Gravitation and absolute units of force" is an abstract of a paper read before the New York Mathematical Society by Prof. W. Woolsey Johnson. Prof. Greenhill's views are