

for a supply of the beans from Japan, which he proposes to distribute extensively for trial. Much consideration has also been given to the utilisation of the various fibrous plants. In the Lloyd Botanic Garden, Darjeeling, much damage continued to be done by the cockchafer grubs until pretty nearly every plant in the garden was killed. "The whole of the grass in the garden and all herbaceous plants rapidly succumbed to its ravages, as did many of the flowering shrubs, only the deeper rooting shrubs and trees being spared. Even the plants in the conservatories did not altogether escape; eggs of the insect having got in considerable numbers into the soil of the pots." In response to vigorous efforts to exterminate this plague about six millions of the grubs were collected and destroyed by the garden labourers, so that at the time of writing the Report it was showing signs of disappearing. In Mr. Duthie's Report it is satisfactory to find that economic plants, as at Calcutta, are largely cared for, and that the cultivation of medicinal plants and the preparation of drugs from them is being proceeded with. Amongst these may be mentioned Alexandrian senna (*Cassia acutifolia*), henbane (*Hyoscyamus niger*), belladonna (*Atropa belladonna*), &c. Additions are also being constantly made to the museum.

PART VI. of the "Herefordshire Pomona" has been issued, and Part vii. and last will be published in the autumn of next year, after the Congress and Exhibition of the Pomological Society of France, to be held at Rouen in October.

IN the *Japan Mail* of August 23 and September 24, Mr. E. Knipping describes the course of two storms which occurred, one on August 17 to 20, and the other September 11 to 14. These descriptions show how very completely the Japan meteorological service is organised, and that good work is being done in the Far East in collecting data for scientific meteorology.

MESSRS. MACMILLAN AND CO. have published as one of their "NATURE Series" volumes, Drs. Gladstone and Tribe's "Chemistry of the Secondary Batteries of Planté and Faure." "About Photography and Photographers" is the title of an interesting gossip little volume by Mr. H. Baden Pritchard, published by Messrs. Piper and Carter.

MISS J. M. HAYWARD wishes to state with reference to Mr. Denuing's letter (p. 56) that she did give the hour (10.30) at which her letter was written, with the date, at the end. She adds that a clock struck ten shortly before she saw the meteor; but she thinks the clock was probably slow, as it generally is. She has no doubt it was the same meteor as that seen at Bath, Bristol, and Chelmsford about the same time.

THE additions to the Zoological Society's Gardens during the past week include two Bonnet Monkeys (*Macacus sinicus*) from India, presented respectively by Mr. H. G. Rose and Miss Morant; a Common Fox (*Canis vulpes*), British, presented by Mr. H. Vaughan; two Bullfinches (*Pyrrhula europæa*), European, presented by Mr. Archibald Aitchison; four Moorish Toads (*Bufo mauritanicus*) from Tunis, presented by Mr. Frederick Bridges; twelve Ruffe, or Pope (*Acerina cernua*) from British waters, presented by Mr. T. E. Gunn; two Michie's Tufted Deer (*Elaphodus michianus* ♂ ♀), a Chinese Water Deer (*Hydropotes inermis*), two Elliot's Pheasants (*Phasianus ellioti*) from China, deposited; six Coal Titmice (*Parus ater*), British, purchased; a Spotted Ichneumon (*Herpestes nepalensis*) from Nepal, five Blue-crowned Hanging Parrakeets (*Loriculus gulgulus*) from Malacca, received in exchange.

OUR ASTRONOMICAL COLUMN

PONS' COMET.—Mr. S. C. Chandler has communicated to the *Astronomische Nachrichten* his own experiences at the Observatory of Harvard College with reference to the remark-

able increase in the brightness of this comet on September 22, which has been already mentioned in NATURE (vol. xxviii. p. 624). He observed with an aperture of $6\frac{1}{2}$ inches. On September 21, between 8h. 55m. and 11h. M.T. he found the comet very faint and diffuse; the central condensation or nucleus about equal to a star of 11 m. On September 22, about 7h. M.T. he was astonished to find exactly in its place a bright, clearly-defined 8 or $8\frac{1}{2}$ mag. star without sensible trace of nebulosity, except with a power of only 50, giving a field of $1\frac{1}{4}$ degrees, and even with that not noticeable except with attention. It was so distinctly stellar an object that an experienced observer might have failed to distinguish it from stars of similar brightness in the neighbourhood. On September 23, at 7h. 30m., he found the physical appearance again greatly changed. The nucleus seemed spread out into a confused bright disk about a half minute (arc) in diameter, outside of which was a nebulous envelope much brighter than on the preceding night, and about one minute and a half in diameter. The comet was judged to be a half magnitude brighter than on September 22. On September 25 it appeared spread out into a confused disk two minutes in diameter, a faint nucleus or concentration of light not brighter than 11 m. So rapid an increase and diminution of light is a very unusual phenomenon; Mr. Chandler thinks that phases of this kind may be characteristic of the comet's mode of light development, as the same variation was repeated on a smaller scale on October 15, when a nucleus of about 9'3 m. appeared, which gradually dissipated on the following evenings, through expansion into the general nebulosity. The comet's distance from the sun when Mr. Chandler remarked the great increase of brightness was 2'18, the earth's mean distance being taken as unity, not the least surprising condition in the case.

In the same number of the *Astronomische Nachrichten* Prof. Schiaparelli gives some account of his observations on the physical appearance of the comet at Milan, which are of much interest in connection with those of Mr. Chandler. On September 22 he found the comet about 3' in diameter, faint and diffuse, the nucleus about 13m., but the sky was not perfectly clear; the observations for position were made at 8h. 30m. M.T. On September 23, about 8h. 13m., the comet had increased in brightness since the previous evening in an extraordinary manner; it now appeared as a star of 8 m., with a very faint surrounding nebulosity of from 1' to $1\frac{1}{2}$ ' diameter. The central part was not exactly a luminous point, but had a sensible diameter and indistinct outline. On the 25th it was still bright, but the nucleus of the 23rd had spread out so as to form a circular nebulosity 3' in diameter, without notable central condensation.

Comparing the Milan and Harvard observations, it would appear that the rapid increase in the light of the comet took place between September 22, at 7h. 45m. and 11h. 45m. Greenwich mean time; it remains to be seen how observations elsewhere will accord with this inference. Mr. Chandler suspected, from a comparison of his own notes with those made by the observers at Kiel and Vienna, that the increase would be found to have taken place between the European and American observations on September 22.

M. Bigourdan, of Paris, says on November 19, "The comet is a nebulosity of from sixth to seventh magnitude, with nucleus: the brightest part of the coma, that which borders on the nucleus, is not symmetrical about it; it is less extended in the angle 110° — 140° , and is brightest in the angle 280° — 290° ." Taking the comet's theoretical intensity of light on November 19 as unity, the intensity on December 31 will be 9'5, and on January 14 (when it is at its maximum), 13'0. In the absence of moonlight the comet must be, for some time, a naked eye object.

THE GENERAL THEORY OF THERMODYNAMICS

THE first of the six lectures on "Heat in its Mechanical Applications" at the Institution of Civil Engineers was delivered on November 15 by Prof. Osborne Reynolds, M.A., F.R.S., the subject being as given in the title. The following is an abstract of the lecture:—

Thermodynamics, Prof. Reynolds said, was a very difficult subject. The reasoning involved was such as could only be expressed in mathematical language; but this alone would not prevent the leading facts and features of the subject being expressed