

similar to those in Zoology already published. The series will consist of twenty original photo-micrographs, accompanied by descriptive letter-press and illustrations. The subjects included in the part we have received comprise longitudinal and transverse sections through the underground bud of *Equisetum*, transverse sections through leaf-buds of the Elm and the Ash, cuticle of *Araucaria*, longitudinal section through node of Sycamore, longitudinal section through flower-bud of Peony, transverse section through fruit of Date-palm, transverse sections through flower-buds of *Iris* and *Lilium*.

MESSRS. MACMILLAN AND CO. will shortly publish "An Intermediate Course of Practical Physics," by Prof. Arthur Schuster, F.R.S., and Dr. C. H. Lees. The book will set forth the course of instruction in practical physics followed in Owens College during the last five years. The explanations having thus passed through the refining fire of a physical laboratory, have been cleared of all the obscurities which tease the intelligence of the average student. The book was primarily designed for use in preparing for the Intermediate B.Sc. and First M.B. examinations of the Victoria University, but the requirements of other Universities are so nearly identical that it will appeal to a much wider circle of students.

DURING the year 1895 the Albany Museum, Grahamstown, made excellent progress. From Dr. Schönland's report we gather that, owing to the large influx of specimens, the capacity of the museum is overtaxed, and the erection of a new building has become a matter of absolute necessity. The Government have therefore been asked for a sum to devote to this purpose, and, considering the value of the collections and the useful work the museum is doing, and can still more effectually perform in a suitable building, it is hoped that the grant desired will be regarded as a judicious outlay. Owing to the rapid growth and increasing value of the herbarium formed in connection with the museum, the Committee think it desirable that the expenses incurred by its management should be borne by a fund apart from the general revenue of the museum, and they have, therefore, asked the Government to grant an annual sum of £100 for this purpose. Dr. Schönland has been experimenting with formaline as a substitute for spirits of wine in preserving specimens. The results obtained have been satisfactory, but he is afraid to discard spirits of wine until he is sure that formaldehyde is a perfectly stable compound, and will keep for a considerable length of time in the hot climate in which the museum is situated.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♀), two Sambur Deer (*Cervus aristotelis*, ♂♂) from India, presented by Mr. Greswolde-Williams; a Brown Capuchin (*Cebus fatuellus*) from Brazil, presented by Mrs. J. Hicks; three young Cheetahs (*Cynælurus jubatus*) from Somaliland, presented by Mr. Kenneth Foster; two West Indian Agoutis (*Dasyprocta cristata*) from the West Indies, presented by Mr. W. Weldon Symington; a Chinese Goose (*Anser cygnoides*, ♂) from China, presented by Mr. L. G. Leveson; a White-crested Cockatoo (*Cacatua cristata*) from Moluccas, presented by Mrs. Crofts; two Pennant's Parrakeets (*Platycercus pennanti*) from Australia, presented by Mr. Clifford Brooks; a Porose Crocodile (*Crocodilus porosus*) from Java, presented by Mr. A. W. Richmond; two Bennett's Wallabys (*Halimaturus bennetti*) from Australia, a Spotted Ichneumon (*Herpestes nepalensis*), two Hamadryads (*Ophiophagus elaps*) from India, deposited; an Entellus Monkey (*Semnopithecus entellus*, ♀) from India, a Great Anteater (*Myrmecophaga jubata*), two Picui Doves (*Columbula picui*) from South America, two Blue-headed Pigeons (*Starnenas cyanocephala*) from Cuba, two Auriculated Doves (*Zenaida auri-*

*culata*) from Chili, four Cape Doves (*Enas capensis*) from South Africa, two Crowned Pigeons (*Goura coronata*) from New Guinea, a Southern Fruit Pigeon (*Crocopus chlorogaster*) from India, a Nicobar Pigeon (*Calanus nicobarica*) from the Indian Archipelago, purchased.

#### OUR ASTRONOMICAL COLUMN.

COMET SWIFT, 1896.—The following is Dr. Schorr's ephemeris for Berlin midnight (*Ast. Nach.*, 3349).

	R.A.	Decl.	Bright-
	h. m. s.	°	ness.
May 14 ...	1 30 19 ...	+ 67 33'9 ...	0.26
16 ...	1 15 49 ...	68 38'1 ...	
18 ...	1 1 20 ...	69 31'9 ...	0.20
20 ...	0 46 52 ...	70 16'9 ...	
22 ...	0 32 32 ...	70 54'3 ...	0.16
24 ...	0 18 19 ...	71 25'1 ...	
26 ...	0 4 14 ...	71 50'3 ...	0.12
28 ...	23 50 16 ...	72 10'5 ...	
30 ...	23 36 28 ...	+ 72 26'3 ...	0.10

The path of the comet lies in the northern part of Cassiopeia until May 25, when it passes into Cepheus.

A PHOTOGRAPHIC TRANSIT CIRCLE.—Many attempts have been made to replace the observer of star transits by a photographic plate; but as most of them require the plate to register star-trails, it is impossible in this way to record the fainter stars. Dr. H. C. Russell has recently proposed another method, which he believes will be capable of giving star positions with much greater accuracy than is possible with the existing transit circles, and is at the same time good for the fainter stars. The instrument is virtually a photographic telescope of thirteen inches aperture, mounted alongside a visual telescope in a rectangular box, which turns on trunnions within a polar axis of the "English" form. An electrically-controlled driving clock, and circles for declination and right ascension complete the instrument. On the scale suggested the circles may be large ones, so that declinations may be read by microscopes to 0".1 and right ascensions to 0.01 sec. The polar axis would be adjusted by the familiar processes, and the instrument would be collimated like an ordinary transit circle; the line of collimation of the star camera must also be made parallel to that of the telescope. The telescope would be set on the desired star before the meridian, and the star would be constantly kept on the cross wire while the plate was being exposed; meanwhile the R.A. would be read off by a second observer noting the times at which the divisions of the circle pass a fixed microscope, the relation of each division to the meridian being very accurately determined. A third observer would read the declination circle. The instrument would next be reversed in the polar axis, and the observation repeated. If there were no collimation errors or flexure due to the position of the telescope the photographic images of the star would be superposed, and if they are not, the point midway between the spots may be assumed to be the mean of the unknown errors. There would of course be two images of any stars, except the guide star, that might be in the photographic field, and their positions relative to the guide star would be determined by measurement of the photograph. The advantages specially claimed are (1) the observation does not depend upon a flying shot at the bisection of a stellar image; (2) at least a partial elimination of unknown errors is effected; (3) the determination of R.A.'s with equal and extreme accuracy for stars in all declinations.

MR. TEBBUTT'S OBSERVATORY.—The report for 1895, which we have just received from Mr. Tebbutt, of Windsor, N.S.W., is a splendid illustration of what can be accomplished almost single-handed by an enthusiastic astronomer. Not less than 957 transits of stars were observed during the year, and this in addition to a varied series of other observations. A large number of occultations of stars was observed, and what may be regarded as a feat in this class of work was accomplished on August 29, when both phases of the occultation of the fifth magnitude star B.A.C. 6127 were observed in full sunlight. The micrometric work includes numerous measures of the positions of the minor planets Hebe and Ceres, and of seventeen double stars which are of peculiar interest. Jupiter's satellites and certain variable stars also received attention, and the various meteorological phenomena were recorded. Eleven papers on the results of the astronomical work were published during the year.