

dyers have held that the natural dye gives a certain richness of shade, or "bloom," which is invariably absent from goods dyed with synthetic indigo. The results of a practical dye test of the two materials, made with the object of throwing light on this disputed question, are described by Mr. Cyril Bergtheil in a report to the Bihar Planters' Association. The conditions were such as to be strictly comparable for the two materials as regards concentration of dye bath, temperature, and fabric dyed. The results obtained, working on the large scale under practical conditions and with dye baths of the same strength, were such as to uphold the objection of the dyers already referred to against the synthetic dye. Natural indigo not only gave a richer shade with the characteristic "bloom," but also actually a darker shade. The difference between the natural and synthetic material, which is hardly apparent in dyeing trials made on the small scale, appears to become of considerable importance under conditions such as exist in actual practice.

THE third fasciculus of the first volume of Prof. O. D. Chwolson's "Traité de Physique," which is being translated from the Russian and German editions into French by M. E. Davaux, and supplied with notes on theoretical physics by MM. E. and F. Cosserat, has been received from M. A. Hermann, of Paris, who is publishing the work. Two previous parts of this excellent treatise were reviewed at length in our issue for February 15, 1906 (vol. lxxiii., p. 362), and it is unnecessary on this occasion to say more than that the present part deals with the liquid and solid states of bodies, and maintains the same high standard which characterised the previous issues.

THE Chemical Publishing Co., of Easton, Pa., has just published "Inorganic Chemistry for Schools and Colleges," by Mr. J. L. Howe. The book is an enlarged and revised edition of "Inorganic Chemistry according to the Periodic Law," by Prof. F. P. Venable and Mr. Howe. The number of experiments has been increased, and prominence has been given to the applications of chemistry. The book is published in this country by Messrs. Williams and Norgate.

IN the new issue of section i. of the catalogue of Mr. Charles Baker, of High Holborn, London, microscopists will find detailed information of a great variety of microscopes and accessory apparatus.

A SIXTH edition of "The Essentials of Chemical Physiology," by Prof. W. D. Halliburton, F.R.S., has been published by Messrs. Longmans, Green and Co. The book has been subjected to a thorough revision, and many parts have been re-written in order to incorporate recent advances in the knowledge of the proteins and of the way they are utilised in the body, together with the results of other researches.

THE authorised English translation of Dr. Ludwig Jost's "Lectures on Plant Physiology," done by Prof. R. J. Harvey Gibson, of Liverpool, will be issued very shortly by the Clarendon Press. The Press also announces the second volume of Dr. Paul Knuth's "Handbook of Flower Pollination," translated by Prof. J. R. Ainsworth Davis, of Aberystwyth, containing an account of all known observations upon the pollination of the flowers of plants of arctic and temperate zones.

A THIRD edition of the late Mr. Herbert E. Wright's "Handy Book for Brewers" has been published by Messrs. Crosby Lockwood and Son. The first edition, which appeared in 1892, was reviewed in NATURE for

November 24, 1892 (vol. xlvii., p. 75). In the present issue, not only has the size of the volume been increased by more than fifty pages, but very many paragraphs have been re-cast and fresh matter inserted. The work of Buchner and others on zymase has been dealt with, and a synoptic table of enzymes has been included.

A NEW edition of "The Imperial Gazetteer of India" is announced by the Oxford University Press. This may be considered as a new work rather than a new edition, and it will consist of twenty-six volumes, including a companion atlas. Apart from the historical volume and a few other chapters of the Indian Empire, the whole of this work has been written by officials in India under orders of the Indian Government, and every page has been submitted to the criticism of the several administrations or departments concerned.

OUR ASTRONOMICAL COLUMN.

COMET 1907b (MELLISH).—The following elements and ephemeris for comet 1907b have been computed by Messrs. Lamson and Frederick from places observed on April 15, 16, and 17:—

Elements.

T = 1907 March 27<sup>h</sup> 56 (G.M.T.).

$\infty = 328^{\circ} 47'$   
 $\Omega = 189^{\circ} 7'$   
 $i = 110^{\circ} 12'$  } 1907<sup>o</sup>

log q = 0.924

Ephemeris 12h. Greenwich M.T.

1907		h.	m.	δ
April 22	... ..	7	46	+35° 36'
" 26	... ..	8	4	+40 58
" 30	... ..	8	17	+44 17

The brightness is decreasing rapidly, from 0.59 on April 18 to 0.11 on April 30, the unit of brightness being that when the comet was first discovered (mag. 11.0). The comet is now circumpolar, and is travelling through the constellation of the Lynx, in a north-easterly direction, towards Ursa Major (Kiel Circular, No. 96).

A NEW VARIABLE OR NOVA, 156.1906.—In the *Atti della Reale Accademia dei Lincei*, vol. xvi. (fifth series), p. 241 (March 3), Prof. E. Millosevich records the observations of a faint star which is certainly an interesting variable, and may prove to be a fading Nova. On November 6, 1906, the star in question was first noticed as a yellow object of magnitude 8.4, its position being

1906.0  $\alpha = 1h. 23m. 56.59s.$ ,  $\delta = +50^{\circ} 22' 12''$ .I.

Subsequent observations showed that the star was fading, the decrease in brightness being roughly proportional to the time, and amounting to about 0.3 magnitude in ten days. By February 26, 1907, the magnitude had decreased to 12.3, the colour, in the interval, having passed through successive stages from yellow to red to quite a ruby-red, which was still notable on February 19, when the magnitude was but 12.0.

THE ALBEDOES OF THE SUPERIOR PLANETS.—A novel method of calculating the albedoes of the superior planets is suggested by Mr. J. E. Gore in No. 382 of the *Observatory* (p. 172, April). The mass of the brighter component of  $\alpha$  Centauri is equal to that of the sun, and their spectra are similar; thus the star may be considered as a duplicate of the sun, and Mr. Gore proposes to estimate the albedoes of the superior planets by comparing their photometric magnitudes when in opposition with that of  $\alpha$  Centauri.

In a previous paper Mr. Gore has shown that, taking the parallax of the star to be 0".75, and assuming the diameter of its brighter component to be the same as that of the sun, the apparent brightness of our central luminary is 75,232,650,000 times that of the brighter component of  $\alpha$  Centauri.

Connecting this with the amount of sunlight inter-



cepted by the planet, the planet's mean distance and its photometric magnitude at opposition Mr. Gore evolved a formula which gave the following values for the albedoes of the several planets:—Mars, 0.2072; Jupiter, 0.595; Saturn, 0.6744; Uranus, 0.61; and Neptune, 0.6276.

THE SECOND GLOBULAR CLUSTER IN HERCULES, MESSIER 92.—No. 3, vol. viii., of the *Astronomiska Iakttagelser och Undersökningar å Stockholms Observatorium* is devoted to a discussion, by Dr. Karl Bohlin, of the measures of a plate showing the cluster Messier 92, taken at Stockholm on April 29, 1898. The conditions of measurement and the corrections applied are discussed in full, the actual measures being tabulated. The number of stars considered is three hundred and forty-eight, and of each of these the position and magnitude for 1898.0 are given. In a third table the resulting places are compared, for twenty-nine stars, with those obtained from measures made at Upsala in 1873, and the apparent proper motions deduced. A diagram given at the end of the volume shows these proper motions graphically, the greatest differences (Stockholm-Upsala) being  $\Delta\alpha = +6''.6$  and  $\Delta\delta = -4''.6$ , whilst the mean values are  $+1''.5$  and  $-1''.7$  respectively.

HALLEY'S COMET.—*Knowledge and Scientific News* for March (No. 3, vol. iv., p. 57) contains an interesting article by Mr. F. W. Henkel on Halley's comet. Mr. Henkel discusses cometary phenomena and mechanics in general, showing their application in the observed appearances of Halley's famous object in particular. The apparitions are carried back as far as 1066, although the identity of the object represented on the Bayeux tapestry with that known as Halley's comet cannot yet be regarded as beyond doubt; probably the investigation now being carried out by Mr. Crommelin may settle this question. Many other interesting points, such as the perturbative action of Jupiter, the existence of an interplanetary resisting medium, and the various features presented by Halley's comet at previous apparitions, are dealt with in a very simple manner in Mr. Henkel's paper.

ECLIPSES OF JUPITER'S SATELLITES, 1878-1903.—The results of the photometric observations of the eclipses of Jupiter's satellites, carried out at the Harvard College Observatory between June 23, 1878, and the end of 1903, are published by Prof. E. C. Pickering in part i., vol. lii., of the *Annals of the Astronomical Observatory of Harvard College*. The present publication contains simply the observational records in detail, with notes on the same, and a catalogue of the eclipses which were observed. The discussion of the entire material by Prof. R. A. Sampson, of Durham University, will appear in part ii. of the same volume.

### RAINFALL IN GERMAN SOUTH-WEST AFRICA.<sup>1</sup>

IN spite of native risings and recalcitrant Parliaments, our German cousins manage to carry on meteorological observations in their African possessions, and some results of their work which are of great importance in connection with the general meteorology of South Africa have just been issued as a supplement to the official "Deutsches Kolonialblatt." In the first section of this publication Dr. Ottweiler has collected and re-printed all trustworthy rainfall records—both official and unofficial—from German South-West Africa, and, for the sake of completeness and comparison, he has added returns from a number of stations in the adjoining British and Portuguese territories. For this alone meteorologists will be grateful to him. A supplementary table giving the positions and heights of the stations, and in most cases a brief description of the orographical features of the country surrounding them, will also be welcome.

As is to be expected in so "young" a country, the material collected is far from homogeneous, and, more-

<sup>1</sup> Wissenschaftliche Beihefte zum deutschen Kolonialblatt, 20. Band, 1. Heft. Mitteilungen aus den deutschen Schutzgebieten; Die Niederschlagsverhältnisse von Deutsch-Südwestafrika. By Dr. F. von Danckelman. Pp. 84. (Berlin: S. Mittler und Sohn, 1907.)

over, most of the stations are of very recent date. The author thus had before him the task of "weighting" them means deduced from the observations to render them approximately comparable among themselves before proceeding to discuss results. The process is not entirely satisfactory, but unless we are to refrain from drawing conclusions until a homogeneous body of statistics is available, some manipulation of the figures is necessary.

The results, which are illustrated in a number of admirable plates, are of exceptional interest, though they will be disappointing to those concerned with the economic development of the country. The coastal districts may be described as practically rainless, which is remarkable, as the prevailing winds are southerly or south-westerly throughout the year, and the land rises tolerably rapidly. In most parts of the world, sea breezes blowing on to rising land yield a copious rainfall, but on the coast of German South-west Africa the air is derived from higher and colder latitudes, and, as it blows over the cold Benguela current before it reaches the land, it contains little moisture when it commences its forced ascent. The heating effect of the sun far outweighs the dynamical cooling due to the ascent, and the condensation stage is never reached. Practically the only moisture which reaches the land near the coast is derived from the heavy fogs, which in winter are of almost daily occurrence. The winter rainfall, which is so prominent a feature in the west of Cape Colony, does not extend north of the Orange River.

In the more eastern inland districts the dry south-west wind prevails throughout the winter, and this portion of the year is accordingly rainless. In summer the wind shifts to the eastward, and a limited amount of moisture manages to reach the country from the Indian Ocean. In the neighbourhood of Windhuk the average annual rainfall is about 12 inches or 14 inches, and in the extreme north-east of the colony it exceeds 26 inches.

When the details of this fall are examined its value for economic purposes is found to be but small. Great fluctuations occur in the annual totals, which are of all the more importance, as the amounts are so small. Thus in the country round Windhuk the fall during the last twenty years has fluctuated between 47 per cent. and 210 per cent. of the average. Further to the south, conditions are considerably more unfavourable.

Great variability in the annual rainfall is not the only disadvantage from which the country suffers. Almost all the rain falls in thunderstorms, and torrential downpours are the rule rather than the exception. A single, though by no means isolated, instance will suffice to give an idea of the prevailing conditions. At Udabis in the year 1900 the total rainfall was 9.5 inches, and of this amount 6.5 inches fell in the course of three consecutive days, leaving only 3 inches to be distributed over the remaining 360 odd days.

It is interesting to compare the German results with those which have just been issued by the Governments of British East Africa and Uganda for the year 1905. In British East Africa the annual totals at thirty-three stations ranged from 16 inches to 99 inches. Only four stations experienced more than two absolutely rainless months, and in only two cases were these consecutive. A summary of totals for past years, which is appended to the report, shows considerable fluctuations in the amount. At three stations with records extending over at least eight years, the totals fluctuate from about 40 per cent. to about 150 per cent. of the mean value for this period.

From Uganda, rainfall data are given for nine stations. The totals for these varied from 37 inches to 96 inches. Only one station had an absolutely dry month. At Entebbe the year was the wettest on record. The total fall was 65.74 inches, 112 per cent. of the average for the last six years. Ten years' records (the first four incomplete) now exist for this station. During this period no absolutely dry months were experienced.

The British Empire has not yet produced a work on the meteorology of any of its possessions in tropical Africa which can be compared with that just issued in Germany, but it is gratifying to find that the Governments responsible for the administration of our share of the Dark Continent are realising the importance of meteorological observations, and of their systematic publication.