

North-West Africa, two Pantherine Toads (*Bufo pantherinus*) from Tunis, on approval; a Bennett's Wallaby (*Halmaturus bennetti*), born in the Gardens. In the Insectarium may now be seen larvæ of the scarce Swallow-tail Butterfly (*Papilio podalirius*), also those of *Attacus atlas* of various sizes, from ones just hatched to ones nearly full-fed. Other noticeable larvæ are the curiously shaped ones of *Stauropus fagi*, and young ones of the North American *Samia cecropia*. Imagos of *Attacus pernyi* are also emerging, reared from eggs laid in the Insectarium in the earlier part of the summer.

OUR ASTRONOMICAL COLUMN

GOULD'S COMET-OBSERVATIONS ON JUNE 11.—Dr. B. A. Gould, director of the Observatory at Cordoba, has communicated to the *Astronomische Nachrichten* particulars of his experiences while observing the great comet of the present year on the evening of June 11. On that evening, he says, "the comet was found with but little difficulty, although considerably north of the estimated place, being recognisable by its diffuse aspect, elongated form, and large diameter, although it was quite pale in the bright twilight, and the tail could not be seen." He had just obtained a rough determination of its position from the equatorial circles for the purpose of finding and identifying some comparison-star, when he found one in the field. He considered it to be some one of the many bright stars of Orion in the vicinity, which would be readily identified, and hence did not complete the approximate determination with the usual care, nor obtain instrumental readings for the star. This he describes as "only a little fainter than the comet itself, and not very dissimilar in aspect: since, although its apparent diameter was much less than the comet's, it was greatly blurred by the exceptionally thick haze and the mists of the horizon, the zenith distance being nearly 80°, I do not think it would have been below the third magnitude, and could rather believe it to have been as bright as the second." Dr. Gould adds: "Only four comparisons were obtained before the comet passed below the horizon; then on attempting to identify the star, I found it in none of the catalogues."

On the next evening he examined the region without finding any visible star, but Rigel was much brighter than the missing object, and there was no visible object in the vicinity of the comet, which he found nearly three degrees to the northward.

The observations gave the following results:—
1881, June 11, position of the comet from the circles of the equatorial, 10h, 58m. 9s. sidereal time. Right ascension, 5h. 11m. 4s. Decl. - 9° 36'.

The comparisons with the star gave:—(Comet—star.)

Cordoba Sid. T.	Diff. R.A.	Diff. Decl.	
h. m. s.	m. s.	R.	
11 8 49	+ 0 49	- 16.40	One revolution
11 11 2.5	49	16.16	of micrometer
11 13 11.0	48	16.17	= 19".08.
11 14 37.5	48.5	15.87	

11 11 55 ... + 0 48.6 ... - 16.15 (- 5' 8" 1).
Thus he deduced for the star's position R.A. 5h. 10m. 16s. Decl. - 9° 30', where our catalogues have no conspicuous star. In his letter to Prof. Krueger he concludes thus:—

"The whole observation has seemed to me so improbable that I have hesitated a good deal before sending it to you, fearing some gross error in reading the circles. But I have discovered none, and the later determination of the comet's geocentric path will remove all uncertainties of this kind."

On receiving these particulars Prof. Krueger, determined the place of the comet for the time of Dr. Gould's observation, from the elements we published in this column, which were founded upon observations between June 22 and July 1, and finds R.A. 5h. 11m. 15s., Decl. - 9° 32'.0, and thence for the place of the star R.A. 5h. 10m. 26s., Decl. - 9° 26'.9, showing only such differences from the observed place as might be well attributed to uncertainty of observation so near the horizon, and to the corrections which the elements used probably required before the perihelion passage. Prof. Krueger remarks that no known bright star exists in this position, and the star-chart of the Berlin Academy for this region, which was formed by Dr. Schmidt, shows here a great blank. He draws attention also to the significant fact that the observed motion in declination in the interval between the first and last comparisons is much less than that

which the comet must have had; the elements would indicate about 45" or more than 2.3 revolutions of the micrometer-screw, while the observations give only 0.5. Dr. Gould especially remarks upon the resemblance of the object to the comet, and Prof. Krueger suggests whether there could have been "eine Verdoppelung des Cometen in Folge einer Luftspiegelung," or again was a second comet observed?

The case is a very interesting one. With elements which must give the comet's place on June 11 within a very few seconds of arc, Prof. Krueger's inferences are fully borne out. Thus for June 11.41962, Greenwich mean time, which corresponds to 11h. 11m. 55s. Cordoba sidereal time, diminished by the time for aberration, the right ascension of the comet is found to have been 5h. 11m. 13.0s., Decl. - 9° 35' 18", agreeing closely with Dr. Gould's instrumental place obtained a few minutes earlier, and the differential observations thus give for the apparent position of the star, R.A. 5h. 10m. 24.4s., Decl. - 9° 30' 10". There appears to be a misprint or an oversight in Dr. Gould's letter as regards the zenith distance of the comet and neighbouring object at the time of his observations, which would be nearer 85° than 80°.

SCHÄBERLE'S COMET.—The following elements of this comet have been calculated by M. Bigourdan, of the Observatory at Paris, from observations on July 18, 23, and 28:—

Perihelion passage, 1881, August 22.60205, M.T. at Paris.

Longitude of perihelion	334 41 10	} M. Eq. 1881.0
" ascending node	96 48 23	
Inclination	39 56 38	
Log. perihelion distance	9.801788	

Motion—retrograde.

Whence the comet's positions for midnight at Berlin, or about 11h. 6m. G.M.T., will be:—

August	Day	R.A.			Decl.	Log. Distance from	
		h.	m.	s.		Earth.	Sun.
11	...	7	54	0	+ 52 7.6	9.9307	9.8307
13	...	8	22	55	52 45.6	9.8073	9.8218
15	...	8	57	39	52 47.2	9.8038	9.8142
17	...	9	37	38	51 51.4	9.8317	9.8083
19	...	10	20	39	49 36.7	9.8031	9.8043
21	...	11	3	21	+ 45 49.6	9.7806	9.8020

The comet was within naked eye vision on the morning of July 29, and the intensity of light, according to theory, should increase until August 25, about which time we may look for a pretty conspicuous object. The most favourable period for observation will be during the last ten days of August.

THE CONNECTION OF THE BIOLOGICAL SCIENCES WITH MEDICINE¹

THE great body of theoretical and practical knowledge which has been accumulated by the labours of some eighty generations, since the dawn of scientific thought in Europe, has no collective English name to which an objection may not be raised; and I use the term "medicine" as that which is least likely to be misunderstood; though, as every one knows, the name is commonly applied, in a narrower sense, to one of the chief divisions of the totality of medical science.

Taken in this broad sense, "medicine" not merely denotes a kind of knowledge; but it comprehends the various applications of that knowledge to the alleviation of the sufferings, the repair of the injuries, and the conservation of the health, of living beings. In fact, the practical aspect of medicine so far dominates over every other, that the "Healing Art" is one of its most widely received synonyms. It is so difficult to think of medicine otherwise than as something which is necessarily connected with curative treatment, that we are apt to forget that there must be, and is, such a thing as a pure science of medicine—a "pathology" which has no more necessary subservience to practical ends than has zoology or botany.

The logical connection between this purely scientific doctrine of disease, or pathology, and ordinary biology, is easily traced. Living matter is characterised by its innate tendency to exhibit a definite series of the morphological and physiological phenomena which constitute organisation and life. Given a certain range of conditions, and these phenomena remain the same, within narrow limits, for each kind of living thing. They

¹ Address at the International Medical Congress. By Prof. T. H. Huxley, LL.D., Secretary to the Royal Society.