(*Cebus fatuellus*) from Guiana, a Red-billed Toucan (*Ramphastos erythoryhnchus*) from Cayenne, purchased; a Smooth Snake (*Coronella lævis*), European, received in exchange.

OUR ASTRONOMICAL COLUMN

DEFINITIVE COMET-ORBITS.—1. The fourth comet of 1874 (Coggia, April 17). Dr. Hepperger, of Vienna, has investigated the orbit of this comet from the whole extent of observation, founding his work upon 17 normals from 638 observed positions. He finds the orbit an ellipse with period of 13,708 years, and considers that his results exclude equally a parabola and any ellipse with a revolution shorter than 8000 years. The aphelion distance is 1144·9 (the earth's mean distance from the sun being taken as unity), at the descending node the radius-vector is 0·717, near the orbit of Venus, and at ascending node it is 11·734. Coggia's comet became visible to the naked eye at the beginning of June, and so continued until it was lost in these latitudes in the middle of July, when the tail had gradually increased to 23°.

2. Definitive elements have also been determined for the second comet of 1847, by M. Folke Engstrom of Lund. The comet was discovered by Colla at Parma, on May 7, and was last observed by the late Mr. Lassell at Starfield, Liverpool, on December 30, or over a period of nearly eight months. The orbit is chiefly remarkable for the large perihelion distance, 2·115, which has been exceeded in very few cases. The resulting elements are hyperbolic $e = 1·0006549$. So far as we know this is the only instance where the latest observations for position have been obtained with a reflector, the statement that has been more than once made that Halley's comet in 1836 was last observed by Sir John Herschel with his 20-feet reflector at Feldhausen, Cape Colony, being a mistake; the last observation was made by Lamont with the 11-inch refractor at Munich on May 17.

THE VARIABLE STAR ALGOL.—The following are the Greenwich times of minima of Algol, occurring before 15h., during the last quarter of the present year, taking Prof. Winnecke's ephemeris as authority:—

	h. m.		h. m.		h. m.
Oct. 14,	13 0	Nov. 9,	8 20	Dec. 16,	14 55
17,	9 49	26,	13 13	19,	11 44
20,	6 38	29,	10 2	22,	8 33
Nov. 3,	14 42	Dec. 2,	6 51	25,	5 22
6,	11 31				

THE MOTION OF 61 CYGNI.—The following formulæ appear to represent the observations of this remarkable system up to the present epoch within about their probable errors; P is the angle of position, D the distance:—

$$D \sin P = + 16''.4657 + [8·63013] (t - 1850·0)$$
$$D \cos P = - 3''.6892 - [9·27178] (t - 1850·0).$$

Hence we find—

	Diff. R.A.	Diff. Decl.	
	"	"	
1753·8	+1·2	−1·7	Bradley.
1778	+1·9	−0·2	Ch. Mayer.
	Δ P (*c* − *o*).	Δ D.	
	°	"	
1781·85	+2·4	−0·04	Herschel I.
1812·30	−1·7	−0·69	Bessel.
1822·26	−0·1	+0·14	Struve and Herschel II.
1830·84	0·0	+0·01	Bessel.
1842·70	−0·3	−0·29	Dawes and Struve.
1856·37	−0·1	−0·29	Demb., Jacob, Secchi, 1854–1857.
1867·15	0·0	−0·16	Knott, Demb., Duner, 1866–67.
1877·47	0·0	0·00	Hall, Demb., Duner, 1875–79.
1881·45	0·0	−0·01	Jedrzejewicz.

And for comparison with measures about this epoch:—

	P.	D.
1882·5	118°·50	20"·469
1883·5	119·08	20·476

THE COMET OF 1763.—The comet observed by Dunlop at Paramatta in 1833 has been referred to as affording an instance of near approach to the earth's orbit at both nodes; according to Dr. Hartwig's elements the distance at ascending node is 0·092, and at descending node 0·186. But a much more noticeable case is offered by the comet of 1763. In Burckhardt's ellipse we find the distance at ascending node 0·0315, and at descending node 0·0252, the time occupied in passing from node to node is 77·2 days.

THE EXCITABILITY OF PLANTS[1]

II.

THE complete knowledge we have gained from our study of the anther filaments of Centaurea of the mechanism of the excitable plant cell, can be applied to every other known example of irrito-contractility in the organs of plants, and particularly to that most remarkable of all such structures, the leaf of *Dionæa muscipula*. Although I described the structure of the leaf just eight years ago in this room, I wil occupy a moment in repeating the description. The blade of the leaf is united on to the stalk by a little cylindrical joint. Here are two models, in one of which the leaf is represented in its closed state, in the other in which it is in its unexcited or open state. The leaf is everywhere contractile—that is, excitable by transmission, but not everywhere susceptible of direct excitation—or, in common language, sensitive. It is provided with special organs, of which we do not find the counterpart in any of the plants to which reference has been made, for the reception of external impressions—organs which, from their structure and position, can have no other function.

The action of the leaf, to which the plant owes its name, and by which it seizes its prey, is, in its general character, too well

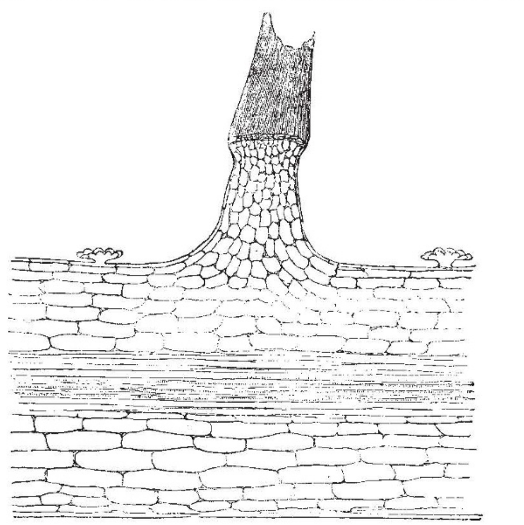

FIG. 6.—Transverse section of lobe of leaf of Dionæa comprising the root of a sensitive hair.

known to require description. In the shortest possible terms, it is the sudden change of the outer surface of each lobe of the leaf from convex to concave, and at the same time the crossing of the two series of marginal hairs, as the fingers cross when the hands are clasped. What I desire to show with respect to it is, that here also the agents are individual cells—that is, that the individual elements out of which the whole structure is built are the immediate agents in the production of the movement.

A cross-section of the leaf shows the following facts: If the section be made in the direction of the parallel fibro-vascular bundles which run out from the mid-rib nearly at right angles, and happen to include one of these bundles, it is seen that it consists of three parts, viz. the fibro-vascular bundle in the middle and equidistant from both borders; of the cylindrical cells of the parenchyma on either side, and of an external and internal epidermis. The external epidermis is smooth and glistening, and its cells possess thicker walls than those on the opposite surface.

[1] Lecture delivered at the Royal Institution June 9, 1882, by Prof. Burdon Sanderson, F.R.S. Continued from p. 356.