Laut, two Prince Albert's Curassows (*Crax alberti*) from Columbia, purchased; two Common Foxes (*Canis vulpes*), four Chilian Pintails (*Dafila spinicauda*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

THE COMET OF 1106.—Amongst the comets which were thought to present certain indications of identity with the great comet of 1843 was that recorded by a large number of European historians, as well as in the Chinese Annals, in the year 1106. The circumstances of its appearance may be thus briefly stated: On the 4th of February, or, according to others, on the 5th, a star was seen which was distant from the sun "only a foot and a half"; it was observed from the third to the ninth hour of the day. Matthew Paris and Matthew of Westminster distinctly term it a comet. Pingre, not having the experience of the comet of 1843 as a precedent, questioned the possibility of seeing one of these bodies at so small a distance from the sun as the above expression may be taken to imply. Now, however, we are able to connect, with much probability, the star viewed in the day-time with the comet which on February 7 was discovered in Palestine about the commencement of the sign Pisces. On this day, we are told by three contemporary writers, a comet appeared in that quarter of the sky where the sun sets in winter, and occasioned great surprise; a white ray extended from it to a great distance. From the time of its first appearance "the comet itself and the ray, which had the whiteness of snow, diminished day by day." Others, on the contrary, say that the train, which had a more than milky whiteness, appeared to increase daily. In the west of Europe it does not seem to have been remarked till February 16 or 18. According to some writers it was visible only a fortnight, others say that it continued to shine for forty days, or during the whole of Lent, from February 7 to March 25; an eye-witness records that after fifty days the most acute vision only sufficed to distinguish it with difficulty. There is similar contradiction respecting the aspect of the comet, though most of the historians testify to its great brightness and apparent magnitude. On February 10, according to Gaubil's manuscript, used by Pingré for his "Cometographie," it was near the end of the sign Pisces, with a tail 60° in length. European chronicles mention that the tail extended to the beginning of the sign Gemini, under the constellation of Orion, whence, as Pingré points out, the latitude of the comet must have been south, while as the sun was in 25° of Aquarius, it could hardly be less advanced than 10° or 12° of Pisces to be seen in the evening after sunset. Thence, about February 16 or 18, it moved to the western quarter of the heavens, and after many days had elapsed, as Pingré records: "La comète parut du côté du septentrion vers l'occident: sa queue, semblable à une grand poutre, regardoit la partie du ciel qui est entre le septentrion et l'orient; on la voyoit jusque vers le milieu de la nuit. Durant vingt-cinq jours elle brilloit de la même manière à la même heure." Williams, in his account of comets mentioned in the Chinese annals, has a notice of the one in question. In the reign of Hwuy Tsung, the 5th year of the epoch Tsung Ning, the 1st moon, day Woo Seuh (1106, February 10), a comet appeared in the west. It was like a great Pei Kow (a kind of vessel or measure). It appeared like a broken-up star. It was 60 cubits in length and 3 cubits in breadth. Its direction was to the north-east: it passed the sidereal division Kwei (determined by β, δ, ϵ Andromedæ and stars in Pisces), and through the divisions Lew (determined by α, β, γ Arietis), Wei (by the three stars of Musca), Maou (by the Pleiades), and Peih (by α, γ, δ, &c., Tauri). It then entered the clouds and was no more seen. Williams, doubtless influenced by this last expression, and the object having been said to resemble a broken-up star, and probably overlooking the presence of the comet recorded by the European historians in the same part of the sky, adds: "This appears to have been a large meteor, as it seems to have been seen for a short time only." But there can be little hesitation, we think, in identifying the body remarked in China with the European comet, its track through the constellations, as given by Williams, which agrees with Gaubil's manuscript, representing very satisfactorily the particulars found in the European chronicles.

In 1843 Laugier and Mauvais, reducing their elements of the great comet of that year to 1106, and assuming the perihelion passage to have taken place on February 3, found the following geocentric track.

Feb. 4,	Long. 324°,	Lat. −3°		Feb. 16,	Long. 4°,	Lat. −23°
7, ,,	335, ,,	−10		March 5, ,,	40, ,,	−28
10, ,,	345, ,,	−16		25, ,,	60, ,,	−27

And they conclude, "en admettant que la comète de 1106 est une apparition de la comète de 1843, toutes les observations sont satisfaites." It is not easy to see how such an inference can have been drawn in face of the circumstances mentioned by the historians during the later period of the comet's visibility, when it was seen to the north of west, with a tail extending towards *the north-east;* a condition wholly incompatible with the elements of the comet of 1843, which body did not remain on the northern side of the ecliptic so long as three hours. On reducing Hubbard's parabola of 1843 to 1106 we have the following positions, assuming perihelion passage February 3·5 G.M.T.:—

G.M.T.		Long.	Lat.	Log. r.	Log. Δ.	Intensity of Light.
	h.	°	°			
Feb. 4,	0 ...	322·9 ...	−1·7 ...	8·8080 ...	9·9704 ...	277·6
19,	8 ...	12·6 ...	−25·1 ...	9·8377 ...	9·9543 ...	2·6
March 25,	12 ...	60·3 ...	−27·3 ...	0·1725 ...	0·2619 ...	0·13

These places are in agreement with those found by Laugier and Mauvais; that for March 25 corresponds to R.A. 63ᵐ·7, Decl. −6°·4.

It is well known that the comet of 1106, with better reason, was long supposed to be identical with the famous comet of 1680. That point has been discussed elsewhere. Our object now, since the possibility of the identity of the comet of 1106 with that of 1880 and 1843 has been again mooted, is to draw attention to the main difficulty that exists in the acceptance of the idea.

PHYSICAL NOTES

M. ANTOINE BREGUET, at a lecture upon Recent Advances in Telegraphy, exhibited some ingenious apparatus illustrating the principles of the duplex and quadruplex telegraph, the actions of the electric currents being most successfully represented by the flow of water in tubes.

PROF. CARMICHAEL describes, in the *American Journal of Science*, a device for rendering the sonorous vibrations of a flame visible to a whole audience. He passes coal-gas through a König's manometric capsule, and then leads it by a tube into a burner inclosed in a small mica cylinder or lantern, which is rotated either in a vertical or a horizontal plane. The ring of light thus produced is broken up by the sonorous vibrations into a serrated form, the forms of the serrations varying with the nature of the sound. To increase the brilliance of the light the gas is previously passed over a sponge soaked in some volatile hydrocarbon such as "gasoline" or "benzoline," and oxygen is also supplied into the mica lantern. A shrill whistle produces very fine serrations invisible thirty feet away. The human voice at ordinary loudness produces serrations two or three inches deep round the ring. A modified capsule placed upon the various parts of a vibrating body serves to investigate their modes of vibration, nodal points, &c.

SOME curious experiments on the magnetic behaviour of elder-pith have lately been made by M. Ader. Pith-balls placed in a powerful magnetic field are strongly attracted.

PROF. ROWLAND contributes a long and careful memoir upon thermometry and the mechanical equivalent of heat to the *Transactions* of the American Academy of Arts and Sciences. His results differ by about ·25 per cent. from the accepted numerical determinations of Joule's equivalent. Amongst other matters noticed in this memoir is an alleged decrease in the specific heat of water at higher temperatures.

A CONTEMPORARY gives the following method of illustrating the indestructibility of matter:—Two sealed glass tubes of equal weight, one of them containing oxygen and a little powdered charcoal, are prepared. The charcoal may be caused to burn away completely by heating it by means of a small flame. On placing the two tubes on a balance it will be seen that there has been no variation in weight.

THE process of electrodeposition is now finding a useful application in the production of bronze statuary, where it promises to supersede the process of casting. The Electrometallurgical Company of Brussels have just produced a colossal statue of Van