tion of an open cylinder is a new evidence of its disruptive force. In the year 1884 Prof. Meyer, in conjunction with Prof. Seubert, showed that the detonating mixture of acetylene and oxygen ignites at a lower pressure than all other combustible gases, a pressure equal to thirty-two millimetres of mercury being sufficient to enable it to explode, while hydrogen and oxygen require a pressure of at least one hundred millimetres, and carbon monoxide and oxygen over two hundred millimetres. This, however, is not sufficient to account for the enormous pressure developed in an open cylinder. Moreover, it cannot be due to the more rapid rate of propagation of the explosion, for M. Berthelot and Prof. Dixon have independently found that the rapidity in the case of the acetylene detonating mixture is but slightly greater than in the mixtures of oxygen with ethylene or marsh gas, and much less than in the case of a mixture of hydrogen and oxygen. Prof. Meyer suggests that the smaller amount of hydrogen contained in acetylene than the other hydrocarbons, resulting in the production of less water vapour and relatively more carbon dioxide, together with the fact that the theoretical temperature of the combustion calculated from existing thermal data, is extremely high in the case of acetylene, may afford some explanation of the extraordinary energy developed during the explosion of the latter.

A PURE white di-sulphide of tin has been obtained by Dr. Schmidt in the laboratory of the Berlin University, which is further distinguished by the property of being readily soluble in ammonium carbonate. It may easily be prepared as follows: Metallic tin is first dissolved in hydrochloric acid, and the stannous chloride oxidised by digestion with nitric acid to stannic chloride, and the excess of acid largely removed by evaporation. After dilution with water the tin is precipitated as the ordinary yellow sulphide by sulphuretted hydrogen. The washed precipitate is next freed from traces of arsenic by solution in concentrated hydrochloric acid and reprecipitating the diluted and filtered solution with sulphuretted hydrogen. The well-washed yellow precipitate is then digested with a large excess of ammonium hydrate for some days at the ordinary temperature, when the whole of it eventually dissolves except small traces of the black sulphides of lead and bismuth. Upon diluting the clear ammoniacal solution and neutralising it with dilute sulphuric acid, an almost perfectly white precipitate is obtained. This precipitate dissolves at once almost completely in ammonium carbonate, and upon again neutralising with dilute sulphuric acid the disulphide precipitated is pure white. This new form of stannic sulphide is very voluminous, and it apparently owes its absence of colour and greater bulk to the fact that stannic sulphide here exists either in a different state of molecular aggregation or of hydration. It is significant that upon drying it becomes amber-yellow and loses its property of dissolving in ammonium carbonate.

THE additions to the Zoological Society's Gardens during the past week include a Lesser White-nosed Monkey (*Cercopithecus petaurista*), a Pel's Owl (*Scotopelia peli*), an Angolan Vulture (*Gypohierax angolensis*), a Black Kite (*Milvus migrans*), a Buzzard (*Buteo*, sp. inc.) from West Africa, presented by Mr. C. B. Mitford; two —— Baboons (*Cynocephalus*, sp. inc.) from East Africa, presented by Mr. Charles Palmer; a Chilian Sea Eagle (*Geranoætus melanoleucus*) from South America, presented by the Rev. Fred L. Curne; two Bronze-winged Pigeons (*Phaps chalcoptera*) from Australia, presented by Mrs. Amy Jones; ten Surinam Toads (*Pipra americana*) from Surinam, presented by Mr. F. E. Blaauw; five Three-streaked Euprepes (*Euprepes trivittatus*) from South Africa, presented by Mr. J. E. Matcham: a Muscat Gazelle (*Gazella muscatensis*) from Muscat, an Echnida (*Echnida hystrix*) from New South Wales, deposited; four Lapwings (*Vanellus cristatus*), British, purchased.

OUR ASTRONOMICAL COLUMN.

OBSERVATIONS OF THE TRANSIT OF MERCURY.—Several French astronomers made preparations for observing the recent transit of Mercury across the sun, but the weather conditions on the other side of the Channel were just as unfavourable as they were here. The current *Comptes rendus* contains a brief note on the transit, by M. Trouvelot. This observer saw Mercury projected upon the sun at 4h. 12m. The planet was sharply defined, and appeared as a circular, intensely black, spot on the luminous background of the sun. In spite of careful observation, M. Trouvelot was unable to detect any trace of a luminous ring such as he observed round the planet during the transit of 1878. The unfavourable conditions of observation, however, are sufficient to explain the absence of the phenomenon.

Dr. Janssen also contributes a note on the transit of Mercury to *Comptes rendus*. He intended to look particularly for the "black-drop" observed during the transit of Venus in 1874, but clouds prevented the observation.

EPHEMERIS OF ENCKE'S COMET.—The following positions for Encke's Comet during this year are from an ephemeris given by Dr. O. Backlund in the *Astronomische Nachrichten*, No. 3263. The comet will pass perihelion on February 4, 1895. In the year 1862, its perihelion passage occurred on February 6.

Ephemeris for 0h. Berlin Mean Time.

1894.	R.A. app. h. m. s.	Decl. app. ° ′ ″
Nov. 22 ...	22 35 54·79 ...	+ 9 6 51·0
,, 24 ...	33 25·02 ...	8 40 53·6
,, 26 ...	31 7·93 ...	8 15 59·1
,, 28 ...	29 3·11 ...	7 52 9·1
,, 30 ...	27 9·98 ...	7 29 24·0
Dec. 2 ...	25 28·18 ...	7 7 43·2
,, 4 ...	23 57·09 ...	6 47 5·3
,, 6 ...	22 36·02 ...	6 27 27·9
,, 8 ...	21 24·29 ...	6 8 48·5
,, 10 ...	20 21·19 ...	5 51 3·6
,, 12 ...	19 25·94 ...	5 34 8·3
,, 14 ...	18 37·75 ...	5 17 57·7
,, 16 ...	17 55·77 ...	5 2 25·7
,, 18 ...	17 19·11 ...	4 47 25·7
,, 20 ...	16 46·82 ...	4 32 50·6
,, 22 ...	16 17·82 ...	4 18 32·0
,, 24 ...	15 50·85 ...	4 4 19·0
,, 26 ...	15 24·59 ...	3 49 59·2
,, 28 ...	14 57·30 ...	3 35 18·2
,, 30 ...	22 14 27·09 ...	+ 3 19 58·3

RECENT OBSERVATIONS OF JUPITER.—Prof. E. E. Barnard communicates to this month's *Astronomy and Astro-Physics* an account of his recent observations of the great red spot and other markings on Jupiter. The following points with regard to these features are of interest to observers: "The surface of Jupiter is very strongly marked, during this opposition, by two broad reddish belts, one on each side of the equator, and a broad white belt between them at the equator. The great red spot is fairly distinct in outline, though quite pale—a feeble red. The great bay in the south equatorial belt north of the red spot is still persistent and well marked." Prof. Barnard has observed a number of small black and white spots in Jupiter's northern hemisphere. Two of these objects, a black and a white spot, can easily be seen opposite the great red spot on the planet's disc. Prof. Barnard's measures indicate that the white spot will be in conjunction with the dark one about the middle of January next year, but as the two objects are not exactly on the same parallel, they will only graze in passing one another. The black spot appears to have about the same rotation period of the great red spot. Numerous white spots have been observed in Jupiter's southern hemisphere. A few dusky markings have also been seen on the great white equatorial belt.

THE NEW CYPRESS OF NYASALAND.

IN the most easterly corner of the British Protectorate of Nyasaland, immediately south of Lake Shirwa (between 35° and 36° E. lat, and a little north of 16° S. lat.), lies the large isolated mountain-mass of Milanji. From the plains which surround it the land rises gradually to a height of about 3000 feet, and for ⅔s the lower spurs of the mountain. Above these outliers the mountain is carried up another 3000 feet in abrupt elevations, only broken in places where the larger streams flow down. This

rampart of cliffs borders the upper plateau of Milanji, which is elevated about 6000 feet above the sea-level, and is of considerable extent, though split up into various portions by ravines and precipices. In the centre of the plateau peaks rise to a further height of 3500 feet, thus giving Milanji a total elevation of nearly 10,000 feet above the sea-level.[1]

Mr. Alexander Whyte, the naturalist attached to the staff of Mr. H. H. Johnston, C.B., H.B.M. Commissioner and Consul-General, who usually resides at Zomba, made a botanical excursion to Milanji in 1892, and obtained a good series of the mountain-plants. An account of this collection, prepared by the officers of the Botanical Department in the British Museum, is given in a recently issued part of the Botanical *Transactions* of the Linnean Society.

photograph, and kindly lent to us by the Linnean Society. The timber is of a pale reddish colour, of excellent quality, and easily worked. The bark on the old trees is of great thickness, consisting of layers which are annually shed and renewed. The foliage recalls that of the juniper, while the fruits or cones, which are crowded from four to six together on short lateral shoots, are about three-quarters of an inch long, and from that to one inch wide when open. They consist of four thick woody scales, united below, spreading above, and bearing at their bases on the internal surface a number of small winged seeds.

Examination of the specimens sent home has shown that we are here dealing with a new species of *Widdringtonia*, a small genus of conifers allied to the cypress and juniper. Mr. Whyte's discovery has considerable scientific interest, from the fact that

The Milanji Cypress (*Widdringtonia whytei*).

Among the many plants new to science discovered by Mr. Whyte, and described in this memoir, one is of special interest, owing to its importance from an economic point of view.

In his exploration of the mountain, Mr. Whyte was much impressed with "a large cypress," which formed the most striking feature of the upper plateau. One prostrate trunk, and that by no means the largest seen, measured 140 feet in length, with a diameter of 5½ feet at six feet from the base, and had a clean, straight stem of ninety feet. In other cases long straggling branches are given off nearer the base, as shown in the accompanying figure, prepared by Mr. Worthington Smith from a

it extends the geographical range of the genus, hitherto known only from South Africa, Madagascar and Mauritius, into tropical Africa; and his name has been fittingly associated with the plant, which will henceforth be known as *Widdringtonia whytei*.

Its nearest ally, *W. juniperoides*, is found in the Cederberg Mountains, Cape Colony, where, according to a note by Parlatore in De Candolle's *Prodromus* (vol. xvi. part 2, p. 442), it once formed large forests, but is now rare. The Milanji species is also threatened with extinction; in this case by the bush-fires, the devastating effects of which, Mr. Whyte says, it is deplorable to witness, and which reach even the lofty and almost inaccessible plateau. These fires, originating during the

[1] See "Routes and Districts in Southern Nyasaland," by Bertram L. Sclater, R.E., *Geograph. Journ.*, November 1893.

dry months of August and September in the villages on the lower slopes of the mountain, gradually creep up the precipitous cliffs from tuft to tuft of dried herbage till they gain the grassy table-lands, and raging over the plain eat their way along the edges of the remaining belts of forest; annually scorching, if not burning, the bark and timber of the outside trees, and killing outright the young seedlings. In exceptionally dry seasons even the damper gorges are invaded, and Mr. Whyte describes hundreds of giant trees lying prostrate and piled on each other in all stages of destruction. We are glad to learn that Mr. Johnston, under whose directions Mr. Whyte's exploration was made, has taken steps to prevent a recurrence of such disasters.

Widdringtonia whytei promises to be of great economic value from the excellent quality of its timber for building purposes and furniture. It is easily worked, and is moreover a tree of rapid growth, for Mr. Whyte tells us that in a plantation which he has formed near the residency at Zomba, three-year-old seedlings have already reached a height of ten feet.

Seeds of the new conifer, forwarded by Mr. Whyte, reached this country in 1893, and healthy seedlings have been raised in the Royal Gardens, Kew; in the Botanical Gardens, Edinburgh; in Messrs. Veitch's Nurseries; and in the Zoological Society's Gardens; so that we may hope to see this fine tree ultimately established in Europe.

The existence of a large cedar-like tree on Milanji was first discovered by the Rev. Robert Acland, of the Blantyre Mission, who visited the mountain in 1889 for the purpose of founding a Mission Station. In Mr. Buchanan's narrative of his journey along the southern frontier of Nyasaland (*Proc. R. Geogr. Soc.* 1891, p. 271) it will be found alluded to as "a species of pine-tree" existing in the ravines on the north-eastern slope. In the latter part of 1891, Dr. W. A. Scott and Mr. Henry Brown made the first ascent of Milanji, going up the southern face, and ascertained the existence of large forests of the so-called "pine" at an altitude of 6000 feet above sea-level. A month later Mr. Whyte succeeded in ascending to the trees, and, as already stated, obtained the first specimens which reached this country, and enabled the tree to be classified and described.

When Fort Lister was founded in 1893, the cedar forests were found to come down to a much lower altitude on the north-east slopes of Mt. Milanji, and advantage was at once taken of this to procure a supply of the timber. It was cut up on the spot, and the planks carried to Zomba, where they have been employed for many purposes. When the residency at Zomba was re-roofed with iron this timber was used for the woodwork. There can be, therefore, no question about the value of this discovery.

SCHIAPARELLI ON MARS.

THE following extracts from a translation communicated to *Astronomy and Astro-Physics*, by Prof. W. H. Pickering, are of special interest at the present time, for they set forth Schiaparelli's observations of the planet Mars, and show his views on various Martian phenomena. The original article was contributed by this keen observer to *Natura ed Arte*.

THE POLAR CAPS.

Many of the first astronomers who studied Mars with the telescope, noted on the outline of its disc two brilliant white spots of rounded form and of variable size. In process of time it was observed that whilst the ordinary spots upon Mars were displaced rapidly in consequence of the planet's daily rotation, changing in a few hours both their position and their perspective, that the two white spots remained sensibly motionless at their posts. It was concluded rightly from this, that they must occupy the poles of rotation of the planet, or at least must be found very near to them. Consequently they were given the name of polar caps or spots. And not without reason is it conjectured, that these represent upon Mars an immense mass of snow and ice, similar to that which to-day prevents navigators from reaching the poles of the Earth. We are led to this conclusion not only by the analogy of aspect and of place, but also by another important observation.

As things stand, it is manifest, that if the white polar spots of Mars represent snow and ice, they should continue to decrease in size with the approach of summer in those places, and increase during the winter. Now this very fact is observed in the most evident manner. In the second half of the year 1892 the southern polar cap was in full view; during that interval, and especially in the months of July and August, its rapid diminution from week to week was very evident, even to those observing with common telescopes. This snow (for we may well call it so), which in the beginning reached as far as latitude 70°, and formed a cap of over 2000 kilometres (1200 miles) in diameter, progressively diminished, so that two or three months later little more of it remained than an area of perhaps 300 kilometres (180 miles), at the most, and still less was seen later in the last days of 1892.[1] In these months the southern hemisphere of Mars had its summer; the summer solstice occurring upon October 13. Correspondingly the mass of snow surrounding the northern pole should have increased; but this fact was not observable, since that pole was situated in the hemisphere of Mars which was opposite to that facing the Earth. The melting of the northern snow was seen in its turn in the years 1882, 1884, and 1886.

The southern snow, however, presents this peculiarity, that the centre of its irregularly rounded figure does not coincide exactly with the pole, but is situated at another point, which is nearly always the same, and is distant from the pole about 300 kilometres (180 miles) in the direction of the Mare Erythræum. From this we conclude that when the area of the snow is reduced to its smallest extent, that the south pole of Mars is uncovered; and therefore, perhaps, the problem of reaching it upon this planet is easier than upon the Earth. The southern snow is in the midst of a huge dark spot, which with its branches occupies nearly one-third of the whole surface of Mars, and is supposed to represent its principal ocean. Hence the analogy with our arctic and antarctic snows may be said to be complete, and especially so with the antarctic one.

The mass of the northern snow-cap of Mars is on the other hand centred almost exactly upon its pole. It is located in a region of yellow colour, which we are accustomed to consider as representing the continent of the planet. From this arises a singular phenomenon which has no analogy upon the Earth. At the melting of the snows, accumulated at that pole during the long night of ten months and more, the liquid mass produced in that operation is diffused around the circumference of the snowy region, converting a large zone of surrounding land into a temporary sea, and filling all the lower regions. This produces a gigantic inundation, which has led some observers to suppose the existence of another ocean in those parts, but which does not really exist in that place, at least as a permanent sea. We see then (the last opportunity was in 1884) the white spot of the snow surrounded by a dark zone, which follows its perimeter in its progressive diminution, upon a constantly diminishing circumference. The outer part of this zone branches out into dark lines, which occupy all the surrounding region, and seem to be distributory canals, by which the liquid mass may return to its natural position. This produces in these regions very extensive lakes, such as that designated upon the map by the name of *Lacus Hyperboreus;* the neighbouring interior sea called *Mare Acidalium* becomes more black, and more conspicuous. And it is to be remembered as a very probable thing, that the flowing of this melted snow is the cause which determines principally the hydrographic state of the planet, and the variations that are periodically observed in its aspect. Something similar would be seen upon the Earth, if one of our poles came to be located suddenly in the centre of Asia or of Africa. As things stand at present, we may find a miniature image of these conditions in the flooding that is observed in our streams at the melting of the Alpine snows.

Other white spots of a transitory character, and of a less regular arrangement, are formed in the southern hemisphere, upon the islands near the pole, and also in the opposite hemisphere, whitish regions appear at times surrounding the north pole, and reaching to 50° and 55° of latitude. They are perhaps transitory snows, similar to those which are observed in our latitudes. But also in the torrid zone of Mars are seen some very small white spots more or less persistent. Perhaps we may be permitted to account for these by the existence of a mountain capable of supporting extensive ice-fields. The existence of such a mountain has been supposed also by some recent observers, founded upon other facts.

MARTIAN METEOROLOGY.

As has been stated, the polar snows of Mars prove, in an incontrovertible manner, that this planet, like the Earth, is surrounded by an atmosphere capable of transporting vapour from one place to another. These snows are in fact precipitations of

[1] A note on the melting of the southern snow-cap this year appeared in the last number of NATURE (p. 64).