

vulturina), three Mitred Guinea Fowls (*Numida mitrata*) from East Africa, presented by Mr. George S. Mackenzie; a Tawny Owl (*Syrnium aluco*), British, presented by Mr. G. Gurney; a Long-eared Owl (*Asio otus*), British, presented by Miss Muriel Hele; a Feathery-footed Owl (*Athene plumipes*), a Black and White Jackdaw (*Corvus daurica*) from Newchang, South Mantchuria, presented by M. J. De La Touche; two Indian White-Eyes (*Zosterops palpebrosus*) from India, a Yellow-winged Sugar-Bird (*Cæreba cyanea* ♂) from Brazil, a Dufresne's Waxbill (*Estrelda dufresnii*) from South Africa, six Vulturine Guinea Fowls (*Numida vulturina*) from East Africa, deposited; a Plumbeous Fish-Eagle (*Polióætus plumbeus*) from North-west India, two Golden-headed Parrakeets (*Cyanorhamphus auriceps*) from New Zealand, a Green-winged Dove (*Chalcophaps indica* ♀) from India, purchased; two Emus (*Dromæus nova-hollandiæ*), received in exchange; a Yak (*Poëphagus grunniens* ♂), a Viscacha (*Lagostomus trichodactylus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

OBJECTS FOR THE SPECTROSCOPE.

Sidereal Time at Greenwich at 10 p.m. on July 10 = 17h. 15m. 5s.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
			h. m. s.	° ' "
(1) G.C. 4355	—	—	17 55 41	- 23 2
(2) α Herculis	3.1-3.9	Orange.	17 9 38	+ 14 31
(3) β Draconis	3	Yellow.	17 28 0	+ 52 23
(4) ζ Draconis	3	Bluish-white.	17 8 30	+ 65 51
(5) 205 Schj.	8	Very red.	17 38 29	- 18 37
(6) R Scuti	Var.	Red.	18 41 36	- 5 50

Remarks.

(1) Unfortunately this interesting object only attains a low altitude in this country, but it is quite possible that there may be some nights on which spectroscopic observations may be made. It is the object known as the "Trifid Nebula," which is thus described in the General Catalogue:—"A very remarkable object; very bright; very large; trifid; double-star involved." For a further description observers may refer to Herschel's "Outlines." The spectrum was recorded as "continuous" by Captain Herschel in 1868, but in the same year it was observed by Prof. Winlock at Harvard College, and found to contain bright lines. This observer records: "Spectrum of the multiple star continuous, with many bright lines and some bands; one end of spectrum at λ 4280±. . . one bright line seen by C. S. Peirce at λ 4980±." I am not aware that any further observations of the spectrum have been made, but these observations should certainly be repeated with as large an aperture as possible. There can be little doubt that the line near λ 4980 is really the chief nebula line at λ 500. The appearance of bands is especially interesting, as indicating that only a relatively low temperature can be in question.

(2) The spectrum of α Herculis is probably well known to everyone who possesses a telescope and spectroscope. It is a very beautiful one of Group II., all the bands being very wide and dark, giving an appearance of alternating bright and dark bands. From the observations of Prof. Lockyer, Mr. Maunder, and myself, there can now be little doubt that we have here to deal with a mixed spectrum of bright carbon flutings and dark metallic ones. One bright band in the green is coincident with the chief carbon band, and has, moreover, the same appearance. The measures of the dark bands in the green and yellow by Vogel and Dunér show close coincidences with the flutings of manganese (λ 558 and 586) and lead (λ 546), and I have confirmed these by direct comparisons. The principal object in inserting the star in this column is to remind observers that this is a good opportunity for them to demonstrate for themselves that in stars of this type we are dealing with cometary conditions, as indicated by the carbon radiation.

(3 and 4) These stars have spectra of the solar type and of Group IV. respectively (Gothard).

(5) Dunér describes the spectrum of this star as one of Group

VI., in three zones, of which the green is the brightest. He states that the spectrum is rather feebly developed, but it is not clear whether this is due to the faintness of the star, or that the bands are narrow as compared with other stars of the group. If the latter, the star may be one of the long-required connecting links between stars of this group and stars of the solar type.

(6) The spectrum of this variable does not appear to have been recorded, although its magnitude at maximum is about 5. The minimum is irregular, 6.0-8.5, and the period, according to Schmidt, is about 168 days. There will be a maximum about July 14.

A. FOWLER.

SECULAR INEQUALITIES IN THE MOON'S MOTION.—In the *Astronomical Journal* for June 20, Prof. J. N. Stockwell contributes the abstract of a discussion of the problem of the secular variation of the motion of the moon's perigee and node. The value found for the secular variation of the mean longitude of the moon's node does not differ very materially from that found by Laplace and subsequent investigators. But it is otherwise with the secular equation of the motion of the moon's perigee; and if the value Prof. Stockwell has obtained for the secular motion of the moon's perigee is nearly correct, the value found by Laplace and his immediate successors cannot be regarded even as a first approximation to the value of that motion.

If the mean longitude of the moon's perigee be denoted by ω, and the number of centuries from a given epoch by z, the variation Δω of the mean longitude of the perigee at any number of centuries from the epoch are quoted by Airy as follows:—

	Δω
Laplace	- 30''55z ²
Börg and Burckhardt	- 29''98z ²
Damoiseau	- 39''70z ²
Plana	- 40''23z ²
Hansen	- 39''18z ²
Hansen	- 36''31z ² .

Notwithstanding this agreement of the results of other investigators, Prof. Stockwell has found, by direct calculation, that Δω is very nearly expressed by the formula

$$\Delta\omega = + 15''.61z^2;$$

and since the motion of the perigee is direct, it follows that this motion is *accelerated* instead of being *retarded* from age to age, as has been hitherto supposed. The application of the result to the discussion of some ancient eclipses is reserved for a future communication.

ANNULAR ECLIPSE OF JUNE 17.—The current number of the *Comptes rendus* contains a letter from M. A. de la Baume Pluvinel to M. Janssen, respecting his observations at Canea. Photographs of the annular and partial phases were obtained, and will be of service in determining the diameters of the sun and moon. M. Pluvinel also finds that there is no difference between photographs of the spectrum of the edge of the sun during the annular phase and the ordinary solar spectrum. It is interesting to note that during the eclipse the temperature fell from 33°.4 to 27°.4 C.

THE ETHNOLOGY OF THE GAMBIA REGION.

THE Governor of the Gambia, in his last Report, devotes a long section to an account of the African tribes connected with that settlement, of which the following is a brief summary:—

Mandingoes.—The head-quarters of this extensive and powerful race lie in the mountainous district near the sources of the Niger and the Gambia, extending as far as Kong. From this region they overran the surrounding country westward to Bambock, and still pushed on, until the banks of the Gambia, as far as the sea, more or less, fell under their sway. At the present moment the principal countries on the north bank of the river are occupied mostly by Mandingoes, and the dominant tribes in Combo, on the south bank, are also of the same race, though the heathen Jolas in the bordering Fogni country are able to hold their own against them. They practically control the trade of the lower river. Three-fourths of the ground-nuts hitherto cultivated have been grown by them; the export of bees'-wax seems to be also dependent upon the Mandingoes, who bring it down from the interior of the Jola country. They also bring cattle and hides into the market, and cultivate cotton largely, which their women spin and weave into the country cloths which play

so conspicuous a part in the trade of the river. The Mandingo language is rich and musical, and susceptible of more variety of expression than the Jolof tongue, which, next after the Mandingo, is, perhaps, the most prevalent language. The latter adopt the decuple system of numeration, whereas the former only possess a quinquennial period. The Mandingoes, as a rule, are Mohammedans, though many are "Soninkees"; and in all their faith is permeated more or less with Fetishism. The term Soninkee is applied by Mohammedans to all people, irrespective of race, who drink spirits. Physically, they are in general a spare, athletic race, of medium height, often with aquiline features, but in contour always distinct from the typical Negro. In colour, they are not so dark as the Jolofs, but their hair is woolly. The laws in Mandingo towns are administered by "Alcalis," or Sumas, both terms having the same signification. The only difference is that the former is a kind of Prime Minister in a Mohammedan town, while the latter holds a similar office in a Soninkee town. Murder and adultery are punished by death. The sentence in the former case is carried out by killing in the same manner as the murder was committed, and in the latter the adulterer is usually killed with cutlasses. The adulteress suffers only whipping, and is cast out by her husband. Theft is punished by whipping, an instrument something similar to the "cat" being used for the purpose. Slander and disrespect to parents or the aged are punished by fine, which goes to the Alcali and headman of the town. Immorality as distinguished from adultery is almost unknown; but if practised and discovered would meet with the death penalty as in adultery. The Mandingoes still keep up a connection with their original country, and recognize a supreme authority in the ancient Mandingo kingdom, though the recognition is more sentimental than real, the distance being too great for any effective authority to be exercised.

Sereres.—This race occupies the neighbourhood of Joal, Seine, and Baol, to the north of the Gambia, and outside British jurisdiction. They are a distinct people, with a language having no affinity either to the Mandingo or Jolof. They are an independent and comparatively industrious race, cultivating largely both corn and rice; they also rear numerous cattle. They seldom buy cotton goods, and have no craving for luxuries of any description. Their wardrobe never consists of more than two *pagas* or country cloths. During the dry season many Serere youths come to Bathurst to work as labourers for about three months, their ambition being satisfied when they have earned sufficient to buy a trade musket, a knife, a wooden box, and a few minor articles, such as iron bars, iron pots, raw cotton, &c. Others at times come in with small canoes, and cut firewood for the Bathurst market, and also do a little fishing. In religion the Sereres are infidels, and, except in a few instances, have hitherto resisted all attempts to convert them to Islamism. They recognize a Supreme Being, but he is only invoked in case of hostile invasion, a fashion which has doubtless been borrowed from the Mohammedans. The king of Seine, who is the ruler of the Serere nation, keeps one Marabout attached to his person for the express purpose, but his services are never put into requisition on any other occasion. Physically they are a fine, well-grown race, with not unpleasant features, their complexion as a rule being of a deep black. As with the Mandingoes, murder and adultery are punished with death; shooting or decapitation, according to the decree of the king, being the means adopted. Immorality is treated in a more lenient fashion, and resolves itself into a question of money. It is stated by persons who know the customs of both tribes well that the Mandingoes and Sereres frequently condone the offence of adultery if the male culprit is rich enough to satisfy the outraged honour of the husband, and moreover from the necessity of extreme caution that the wives resort to various cunning devices in order to deceive their husbands. The virtue of these communities is therefore more apparent than real. Each Serere man is permitted by custom to have ten wives, but indulgence in a greater number is regarded as a pardonable folly. Theft is punished in a very drastic manner. The thief has the whole of his goods confiscated and handed over to the victim of the robbery. The primitive quinquennial period in reckoning is adopted by the Sereres, as is the case with the Jolofs.

Nominkas.—This race occupies the region known as the kingdom of Nuomi or Barra. Formerly Barra was the most important of all the kingdoms of the Gambia, owing to the number and strength of the war canoes controlled by the king. The present Nominkas appear to be divided into two sections, named respectively the Nomibartokas (meaning those living at

the entrance of the river) and the Nomibantokas (meaning those living more within the river). The former occupy the region between Jonwar and Jinneck, and the latter live between the towns of Essow and Jooroonko. The Nominkas are all Mandingoes, but the Nomibartokas live so near to the Sereres that they speak this language in addition to their own. The Nominkas communicate with Bathurst by means of large canoes, which some of them are very clever at making. These canoes will sometimes carry as much as three tons of ground nuts, of which they cultivate large quantities. In religion most of the Nominkas are now Mohammedans, though originally they were Soninkees. Their laws are similar to the Mandingoes, from whom they sprang.

Jolas.—The history of this primitive and extraordinary race is involved in much obscurity. No idea appears to exist among themselves in regard to their origin, and even tradition is silent except as to recent events in the chronicles of their country. Even under favourable circumstances, Jola intelligence is of such a low standard that it is not easy to acquire much reliable ethnological information from them. So far as it is possible to learn from the people themselves, the Jolas, or Fellups, have always occupied a region having for its eastern boundary Vintang Creek, following the course of that tributary, and extending as far south as the head waters of Cazamance, continuing along the north bank of that river to its mouth, and from thence extending to the limits of foreign Combo. The Banyans, Papels, Balantes, and Biafares, sometimes called Jolas, appear to be allied races. Durand, a former Governor of the Isle of St. Louis, in his voyage to Senegal, published in 1805, gives some interesting details of these people, and the extensive Portuguese establishments which then existed at various stations in Vintang Creek and the Cazamance. He remarks that both banks of the latter river "are inhabited by savage and cruel Fellups, who will not hold any communication with the whites, and are always at war with their neighbours." Those, however, who resided in the neighbourhood of the Gambia, appear to have shown different characteristics, for in writing of the town of Bintan (Vintang), the same author says:—"The negro inhabitants of this part are Felups, they speak a language peculiar to themselves, and are idolaters. . . . Those of Bintan, or its environs, who are occupied in commerce, are gentle, frank, and civilized; they like strangers, are always ready to render them service, and are candid and honest in their commercial dealings." Vintang Creek, once an important trading district, producing large quantities of wax, hides, and ivory, is now all but abandoned, and the people content themselves with the cultivation of sufficient rice and corn to supply the bare necessities of life. They are decidedly an industrious race, and numbers of them come to Bathurst to obtain work as labourers, especially during the trade season. Vessels are laden almost entirely by Jola women, and the merchants would find it difficult to get on without them. Physically they are not an attractive-looking race, and both sexes wear little or no clothing. In their own country there is practically no government and no law; every man does as he chooses, and the most successful thief is considered the greatest man. There is no recognized punishment for murder or any other crime. Individual settlement is the only remedy, and the fittest is the survivor. Unlike the rule amongst most African races, there is absolutely no formality in regard to marriage, or what passes for marriage, amongst them. Natural selection is observed on both sides, and the pair, after having ascertained a reciprocity of sentiment, at once cohabit. No presents are made by the bridegroom, and the consent of parents is entirely ignored. They do not intermarry with any other race. There appear to be three distinct languages spoken by the Jolas, having no affinity to those of the contiguous tribes, and but little resemblance to each other. The vocabulary appears to be poor, as might be expected in the case of a people with so few wants. The Jolas do not count beyond ten, and distinct terms are used only up to five, as in all the tribes noticed, except the Mandingoes. Beyond ten the counting becomes pantomimic, the people using both hands and feet to represent higher numbers. Pieces of stick are also employed for the same purpose. The Jolas, whether from persecution, or for some other reason, have always been an isolated race, and have shunned contact with their neighbours. In spite of the proselytizing nature of the powerful Mandingoes, they have utterly failed to introduce Mohammedanism, and the Portuguese appear to have been equally unsuccessful in establishing the Roman Catholic religion.

Jolofs.—Although “Jolof” is a word very frequently used in Bathurst, and most of the inhabitants speak that language, yet, as a matter of fact, very few of the genuine race are to be found in it. The habitat of the Jolofs is in the adjoining French colony of Senegal. The Jolofs proper are stated to be a handsome race; they are proud, and exceedingly vain, claiming for themselves a very ancient descent. The women are inordinately fond of gay apparel and personal adornments of every description. They frequently pierce the ear along the entire edge with a series of holes, so that this feature may be, as far as possible, loaded with ornamentation. The wool is pulled out to its extreme length and plaited into thin strips, which hang from the head, giving a peculiar character to these natives. Of their moral character report speaks very unfavourably, mendacity, deceit, and licentiousness being prominent characteristics of this people. In religion they are fervent Mohammedans; they rarely intermarry with any other race, but are extremely sensitive to any mishap in this direction. The Jolof language is expressive, and has received considerable attention from philologists, more than one grammar having been published. Golberry, who gives a vocabulary of the Jolof language, pertinently comments upon the curious fact that in spite of the contiguity of the Jolofs to the Moors, who adopt the Arabic system of numeration, the former should have persistently adhered to the method of reckoning on one hand only, instead of on both. It is a curious and perplexing circumstance that the Mandingoes, who are an inland people, and probably came into contact with more enlightened races at a later period than the tribes nearer the coast, should be in advance of all the other races in this portion of West Africa in their system of counting. The question whether this method originated with the language, or has been acquired at a later period of their history, must be left for philologists to settle. The Mandingoes, however, have always been great traders, and it is possible that their instincts taught them at an early stage the advantages of a system based on ten fingers instead of five.

Salum Salums.—These are neighbours of the Sereres, and through intermarriage their language is a mixture of Jolof and Serere. In religion they are partly Marabouts and Soninkees. The former frequently take wives from the latter, but no Marabout would give his daughter to a Soninkee unless to a king or a prince, and that reluctantly.

Loubeys.—This race may be described as the gypsies of North-West Africa. It is almost impossible to obtain any certain information in regard to their history. They wander about from place to place, but have no settled country. There can be no doubt that they are practically the same race as the Foulahs, though for some reason they have become detached from them. Those seen by the Governor were decidedly better looking than the average Negro, resembling the Foulahs, though of a darker complexion. They confine themselves almost exclusively to the making of the various wooden utensils in use by natives generally, and the manufacture of canoes. They settle temporarily with any tribe but never intermarry with another race, thus preserving the type of feature which obviously separates them from their human surroundings. In religion most of them are pagans, though a few profess Islamism. They have no laws of their own, but are guided by those of the people with whom they are for the time being located. In case of war happening, they very sensibly remove at once to a district where there is peace. The Foulahs and Toocalores, to whom allusion is made below, are practically the same race. Little need be said of them, as the former are a well-known race, and many travellers have noted their unusual lightness of complexion. Dr. Goulsbury, in his report on the Upper Gambia Expedition, gives a concise history of this people. Their capital is Timbo in the Futa Jallon country. The Toocalores reside principally in the Futa Toro country in Senegal, but from having intermixed with other races they are darker in colour. They are a warlike people, and at times are troublesome to our neighbours the French. An appendix to the report contains a vocabulary of common words and expressions used in the Mandingo, Jolof, Serere, Jola, and Foulah languages, all of which are spoken within a comparatively small radius of the Gambia. “No one can fail to be struck with the marked differences in the word forms of the various languages, though Mr. Robert Cust, in his valuable work, ‘The Modern Languages of Africa,’ classes all except the Foulah in one group, which he styles the northern section of the Atlantic sub-group, and which extends from the River Senegal to Cape Mount. It is difficult, however, for any but a trained philologist to detect wherein the relationship lies, or how such radical distinctions

could exist and be preserved in the languages of races living in close proximity to each other. The Jolas especially offer a very curious problem to the ethnologist; it is not probable that they were ever an interior race which has been pushed gradually by stronger neighbours to the sea, and it is somewhat extraordinary that they should have been able hitherto to withstand the power of the conquering Mandingo, and to maintain their individuality. It is true they have always been a savage and intractable people, but in point of numbers their weakness would seem to mark them out as an easy prey to the invaders. This, however, is far from being the case, and there is but little of the Jola country in the hands of strangers.”

SEEDLING SUGAR-CANES.

THE Government of Barbadoes has issued a valuable Report bearing on seedling sugar-canes. It records the results obtained by Prof. J. B. Harrison and Mr. J. R. Bovell on the experimental fields at Dodds Reformatory in 1889. As the subject is one of great importance to the cane industry, the following extracts may be read with interest. We may note that a paper describing the fruit of the sugar-cane was lately read before the Linnean Society by Mr. D. Morris, and that seedling canes are growing at Kew.

“In our Report for 1888 we briefly alluded, for the purpose of insuring priority, to the fact that we had succeeded in obtaining seedlings of the sugar-cane.

“That the sugar-cane could not produce fertile seeds has been for many years regarded by botanical authorities as a proved and accepted fact, whilst very many of the older planters here believed that the canes could produce fertile seed.

“Attention here was first strongly directed to this point in 1859 by the Hon. J. W. Parris, who succeeded, at his estate, Highlands, in St. Thomas’s parish, in rearing successfully self-sown seedlings. . . .

“Mr. Parris has recently stated to us that he finally succeeded in planting four and a half acres with canes raised from these original seedlings, and that he estimated their yield of sugar at over four hogsheads to the acre. He, however, from certain objectionable characteristics which arose in the canes, finally abandoned their cultivation, and did not again turn his attention to the subject. In order to test the truth of Mr. Parris’s discovery of cane seedlings, several persons here attempted to raise them from the cane arrows. This was done successfully by Mr. Carter, of Bridge Cot, and by Mr. J. Wiltshire Clarke, neither of whom, however, appeared to have attached much importance to their results. At another time Mr. T. Clarke, of Cane Field, discovered cane seedlings growing from a fallen cane arrow, but did not succeed in raising them, and Mr. E. S. Sissett found some cane seeds growing in Christ Church about the year 1861; these were allowed to grow amongst canes that were planted in the usual way, but as they were very small and thin when they reached maturity they were destroyed. In this last case the seeds appear to have come from the Bourbon canes. Next we find that the late Mr. W. Drumm paid much attention to this subject and wrote several letters to the *Sugar Cane* upon it. He, however, stated to us in March 1884 that, whilst he had repeatedly obtained cane seed, he had never succeeded in raising canes from it, and that he believed the various instances we have mentioned to be errors of observation.

“At Dodds the cultivation of the different varieties of canes in large numbers and side by side has placed us in a specially favourable condition for examining into this question. In January 1888, Mr. J. B. Pilgrim, one of the overseers at Dodds, reported to us that in the neighbourhood of one of the experimental fields he noticed that certain fine grasses were springing up, and we found at intervals from then to the middle of March similar seedlings. These were found not only on the surface of the field, but also growing in the bottom of a somewhat deep drain which had been recently dug. Much difficulty was experienced in preserving these seedlings, as they were exceedingly sensitive to the effects of exposure to the sun or wind. In June 1888 the seedlings which had survived were transplanted, giving us about 60 plants. Certain of them were dug up with great care, and placed in water until the soil crumbled away from their roots, and were carefully examined for any traces of cane