Observation of the Total Solar Eclipse. 79


At the request of the Astronomer Royal I have tried to collect information which may serve as a guide in the selection of stations for the observation of this important eclipse. As I mentioned in a verbal communication made to the Society after the paper by the Astronomer Royal in March last, the conditions along the greater part of the track are unfavourable, since it lies largely in the two largest tropical river-basins of the world, the Amazon and the Congo. Possible stations would seem to be in Ceará, Brazil; the Island of Principe; in the neighbourhood of Libreville, French Congo; and on the western escarpment of Lake Tanganyika.

St. Paul's Rocks in the Western Atlantic are near the central line, but are quite unsuitable for the establishment of a station. They are described in the narrative Report of the Challenger Expedition as volcanic, with no fresh water except in the rainy season, and no anchorage. The central line cuts the coast of Liberia a few miles inside Cape Palmas (the diagram in the Nautical Almanac is incorrect here), but the rainfall at Cape Palmas is about 100 inches, the dry season is short, from December to February, and during the rains much of the coast is under water. Putting aside these two localities, we may briefly consider the other.

1. The interior plateau of the State of Ceará is described as quite healthy, and with less rain than on the coast or in the Amazon basin. The town of Sobral is about ten miles south of the central line, and Santa Anna is almost upon it. These have connection by railway with the port of Camocim. The rainy season is described as lasting from February to June, but the rains are intermittent, and sometimes fail altogether. The experience of the observers of the eclipse of 1893 was not unfavourable. I am indebted to Mr. J. C. Willis, formerly Director of the Jardín Botánico, Rio de Janeiro, for the information that the province of Ceará has a dry and sunshiny climate, and that no better place to see the eclipse can be desired. He suggests that inquiries should be addressed to Dr. Alberto Löfgren, of the Jardín Botánico, Rio de Janeiro, a well-known botanist who has an extensive knowledge of the State of Ceará. In accordance with this suggestion, a letter has been written to Dr. Löfgren, but up to the present no reply has been received.

2. The southern end of the Island of Principe lies some twenty miles north of the central line, but in many respects it offers great facilities for the establishment of an expedition, having good landing jetties, light railways, and large plantation buildings, especially in the north of the island. I am indebted to Captain Ernesto de Vasconcellos, Secretary of the Lisbon Geographical Society, for the following information:
The largest company of planters in the island is the Sociedade de Agricultura Colonial, who own a very large property stretching south-west from Santo Antonio so far as Punto do Grosso, the south-west point of the island, in latitude 1° 32½' N. Captain de Vasconcellos undertakes that an expedition would receive all facilities from this Society. He sends a copy of meteorological observations taken at the "observatory of the plantation" at a height of 135 metres, but in an unspecified locality, giving the following particulars for May 1914 and 1916:

May 1914:
- Clear sky: 28 days
- Cloudy: 1 day
- Heavy rain: 2 days

May 1916:
- Clear sky: 19 days
- Showers: 7
- Heavy rain: 4
- Thunder: 1 day

The temperatures in the house in these months were exceedingly uniform, about 26° centigrade, with very slight variation. Captain de Vasconcellos, who knows the island personally, suggests that the south-east portion would form the best station for observation. He is sure that the Board of Directors of the Sociedade de Agricultura Colonial will send orders to the manager of the plantation for accurate observations of sun and cloud this year and next.

3. The line of totality passes eighteen miles north of Libreville, the capital of French Equatorial Africa, at the mouth of the Gaboon River. There are hills a little way inland, north-east of the town, which might provide good stations. The rainy season is coming to an end in May. I am not able at present to give local information as to conditions here.

4. The station which seems to offer by far the best chances of clear sky is at Baudouinville, or in its neighbourhood, on the high western shore of Lake Tanganyika. In reply to inquiries addressed to Monseigneur le Vicaire Apostolique du Haut Congo, the following information has been received:

Baudouinville and Lusaka, two important stations of the White Fathers, lie on the slope towards the lake at a height of about 1200 metres above sea, and about 350 above the lake. The lake shore is everywhere very steep, cut up by ravines and torrents, and the tracks are unbridged. Packages weighing as much as 100 kilograms would be very difficult to transport. The Mission has never attempted to transport so heavy a package, and has no experience as to the difficulties. West of these stations the ground continues to rise to the watershed between the short streams running down the Tanganyika escarpment and the Congo basin to the west. This watershed is in general about 2000 metres above sea, with occasional higher summits, some of them with flat tops. These summits would probably give a clearer western
horizon, but it would need a very strong party to establish an
eclipse camp at such a height and in such a country.

Unless Baudouinville and Lusaka are much more shut in to
the west than appears from the very imperfect maps available,
it would probably be inadvisable to go further west than these
stations.

The chances of clear sky on May 29 are very great. The
rains ordinarily finish between the 1st and the 10th of the month,
or, as the Bishop puts it, "with the April moon," and they rarely
last beyond the 15th, though there may be some passing rain
after that date. But during the twenty-five years that he has
been in the country he has never seen the rainy season prolonged
beyond May 15 in the neighbourhood of Baudouinville and
Lusaka. This would give about fifteen days at least for prepara-
tion before the date of the eclipse. Casual cloud is possible in
the morning, but rare in the evening. There is always a little mist
in the air, which covers the whole country as soon as the dry
season begins, and which limits the view to about 50 or 60
kilometres, whereas in the wet season one could sometimes see
150; but in May this mist is much less thick than later on in
the dry season. In any case, even if the estimate that even in
the beginning of the dry season one can expect to see 50 kilo-
metres is not too sanguine—and this I should fear,—there can
be little reason to hesitate in choosing Baudouinville or Lusaka
as stations with every probability of fine weather. The Bishop
promises to send rainfall observations from Baudouinville, and
to have observations made at Lusaka. He very kindly concludes
his letter by undertaking that his missionaries will be ready to
give to an eclipse expedition all the assistance in their power.

We have also letters from Sir Alfred Sharpe, K.C.M.G.,
formerly Governor of Nyassaland, which give useful information
and advice. He writes: "I should say that on the high
mountain behind (west of) Baudouinville, on Lake Tanganyika,
a station should certainly be established. The end of May would
be about the very best season of the year for observation there,
as the rains finish by the end of April; and though the dry season
will have set in, the grass fires will not have commenced, and the
air should be clear, with skies of open blue, with flecks of small
fleecy clouds high up—the dry-season sky. I know the lake, but
have not landed at Baudouinville. There is very high country west
of the settlement: healthy. Communications would be good: mail
from Dar-es-Salaam to Ujiji and steamer thence to Baudouinville.
Plenty of native porters should be available at Baudouinville." In
a later letter Sir Alfred Sharpe says: "Should there be an
expedition from England to Tanganyika to observe this eclipse,
and should the R.A.S. be in want of someone who knows Africa
(and Tanganyika) to organise the transport matters in the country
and carry out arrangements with native carriers, etc., I should
be glad to give my services. We may hope that the war will
be over before the beginning of 1919, in which case transport as
far as Ujjii would be quite a simple matter. There will probably, however, be a lot to do at Baudouinville in transporting everything to the site selected, in the erection of temporary buildings and shelters, in arrangements for supply of native food, and so forth.

Such is the information which I have been able up to the present to collect for the use of the permanent Eclipse Committee. It is fortunate that the conditions at Baudouinville, the most accessible of the high and healthy stations in Africa, seem to promise so well.

[Note added 1917 November 28.—The country west of Lake Tanganyika is not topographically surveyed, but geodetic triangulation has been carried to the northern end of the lake from a side of the Uganda-Congo Survey triangulation, while the southern end of the lake has been connected with boundary survey triangulations, and a line of triangles has been carried up the west coast to the Lukuga. The position of the mission town at Baudouinville is Lat. S. 7° 3' 28" N.; Long. E. 29° 43' 55" E. We have at the R.G.S. a list of positions of many other points, communicated by Captain Maury, of the Belgian Colonial Service.]

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**Micrometrical Measures of 250 Double Stars.** (List V.)

By W. S. Franks.

**PART I.**

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