

August, was 3.72 inches, which has only been smaller in three previous summers since 1841. There were during the summer two periods of absolute drought—twenty-three days from July 1 to 23, and seventeen days from August 2 to 18. Rain fell on 156 days during the year; December had twenty-three wet days and November twenty.

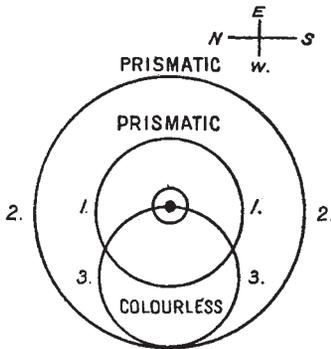
In the Ebbw Vale Sir Alexander Binnie measured 29.23 inches of rain from October 18 to December 31, and during the whole of this period there were only nine days without rain.

The duration of bright sunshine at Greenwich was 1780 hours, which is 425 hours in excess of the average of the past thirty years, and is the brightest year on record since 1881; the next brightest year was 1906, with 1735 hours. July had 335 hours' sunshine, which is the sunniest month since the establishment of sunshine records in 1881. The duration of sunshine was in excess of the average in each month, with the exception of January and March.

CHARLES HARDING.

OBSERVATION OF SOLAR HALOS IN AFRICA.

AN optical phenomenon is reported by a correspondent from Elobey Island, lat. 1° N., long. 9° 30' E., in the Gulf of Guinea. On October 11, 1911, between 1 and 2 p.m., he observed "a large light, of different colours as the rainbow, encircling the sun, and at times only visible on the east side and sometimes only on the west of the sun, and at 2 p.m., our time, disappeared altogether." During this time the sky was covered with swiftly passing small clouds, and shortly after the disappearance of the phenomenon heavy rains began to fall. Without information as to the angular diameter of the ring or the order of the colours it is not possible to say with certainty whether it was a halo or a corona, but its appearance with low clouds makes it



OCT 17<sup>th</sup>  
10.30 A.M. MOON.

probable that the phenomenon was a corona. The corona sometimes appears round the sun when it shines through thin cloud or mist. It is coloured, red being outermost, and several successive sets of coloured rings are usually formed. They are due to the diffraction which the light undergoes in passing among drops of which the cloud is composed. The radius of the first ring of the corona varies from 1° to 3°, according to the size of the drops, and radii of the others are successive multiples of that of the first. As the drops of water in the mist or cloud become larger the rings grow smaller. Their diminution consequently implies approaching rain.

Six days after the observation at Elobey Island, on October 17, the combination of halos shown in the diagram was observed by Mr. J. G. Orchardson at Kericho, in British East Africa. The halos 1 and 2 are probably the two of most common occurrence, with radii of about 22° and 46° respectively. The altitude of the sun at the time of the occurrence was presumably about 65°-70°, and for this altitude the horizontal circle through the sun, on which mock suns are usually found, would just touch the larger halo and appear to have its centre on the smaller halo. This ring would be produced by reflection at the vertical faces of ice crystals in the higher atmosphere. It seems most likely that this is the origin of ring No. 3. If, however, the circle had been parallel with the horizon, it is probable that the fact would have been mentioned by the observer. The other possibility is that the circle was a secondary halo formed about a mock sun

in the same way as the 22° halo is formed about the sun itself. Such secondary haloes are very rare. The position of the mock sun which could produce one in the present case would be at the point where the vertical through the sun met the halo of 22° either at the zenith or half way between the horizon and the zenith. In the former case the secondary halo and the mock sun ring would coincide.

PRIZES PROPOSED BY THE PARIS ACADEMY OF SCIENCES FOR 1913.

**GEOMETRY.**—The Francœur prize (1000 francs), for discoveries or works useful to the progress of pure or applied mathematics; the Bordin prize (3000 francs), for improving in some important point the arithmetical theory of non-quadratic forms.

**Mechanics.**—A Montyon prize (700 francs), for inventing or improving instruments useful in agriculture or the mechanical arts or sciences; the Poncelet prize (2000 francs), for a work on applied mathematics.

**Navigation.**—The extraordinary prize of 6000 francs, for a work increasing the efficiency of the French Navy; the Plumey prize (4000 francs), for improvements in steam engines or any other invention contributing to the progress of steam navigation.

**Astronomy.**—The Pierre Guzman prize (100,000 francs), for the discovery of a means of communicating with a star other than the planet Mars; the Lalande prize (540 francs), for the most interesting observation, memoir, or work contributing to the progress of astronomy; the Valz prize (460 francs), for the most interesting astronomical observation made during the year; the G. de Pontécoulant prize (700 francs).

**Geography.**—The Tchihatchef prize (3000 francs), for the encouragement of explorers of the lesser known parts of Asia; the Gay prize (1500 francs), for a study of the reptiles of warm countries, especially the reptiles of Mexico.

**Physics.**—The Hébert prize (1000 francs), for the best treatise or most useful discovery for the practical application of electricity; the Hughes prize (2500 francs), for discoveries or works contributing to the progress of physics; the Gaston Planté prize (3000 francs), for an important discovery or invention in the field of electricity; the Kastner-Boursault prize (2000 francs), to the author of the best work on the various applications of electricity in the arts, industry, and commerce.

**Chemistry.**—The Jecker prize (10,000 francs), for works contributing to the progress of organic chemistry; the Cahours prize (3000 francs), for interesting researches in chemistry; a Montyon prize (unhealthy trades; a prize of 2500 francs and a mention of 1500 francs), for the discovery of a means of ameliorating an unhealthy trade or occupation; the Vaillant prize (4000 francs), for the discovery of a photographic layer without visible grain and as sensitive as the gelatino-bromide now used.

**Mineralogy and Geology.**—The Victor Raulin prize (1500 francs), for assisting the publication of works relating to geology and palæontology; the Delesse prize (1400 francs), to the author, French or foreign, of a work on geological or mineralogical science; the Joseph Labbé prize (1000 francs), for geological works or researches putting in evidence the mineral riches of France, its colonies or protectorates.

**Botany.**—The Desmazières prize (1600 francs), for the best work published during the year on Cryptogams; the Montagne prize (1500 francs), for works on the anatomy, physiology, development, and description of the lower Cryptogams; the de Coincy prize (900 francs), for a work on Phanerogams; the grand prize of the physical sciences (3000 francs), for the geographical study of the flora of French western Africa; the Thore prize (200 francs), for the best work on the cellular Cryptogams of Europe; the de la Fons-Mélicocq prize (900 francs), for the best work on the botany of the north of France.

**Rural Economy.**—The Bigot de Morogues prize (1700 francs), for a work contributing to the progress of agriculture in France.

**Anatomy and Zoology.**—The Savigny prize (1500 francs), for the assistance of young travelling naturalists, not receiving Government assistance, who specially work on the invertebrates of Egypt and Syria; the Cuvier prize