Preliminary Notice of a new Sunshine-Recorder

This content has been downloaded from IOPscience. Please scroll down to see the full text.

1884 Proc. Phys. Soc. London 6 216

(<http://iopscience.iop.org/1478-7814/6/1/319>)

View [the table of contents for this issue](#), or go to the [journal homepage](#) for more

Download details:

IP Address: 216.165.126.139

This content was downloaded on 31/08/2015 at 08:54

Please note that [terms and conditions apply](#).

ascending or salt branches of the curves are almost absolutely parallel, but exhibiting a slightly opposite curvature.

Perhaps the most salient fact concerning this group is that the methyl compound is intermediate in these of its physical properties between the ethyl and the amyl members. So interesting did this relationship appear, that we have determined the specific gravities of the three salts. Turpentine was used as the liquid displaced. The dry salt having been weighed in the specific-gravity bottle, a little turpentine was added and the air exhausted. The bottle was subsequently filled with turpentine in the usual way. The air-temperature was $19^{\circ}\cdot6$, and the specific gravity of the turpentine compared with water at the same temperature was $0\cdot86838$. It was found that

$$\text{at } 19^{\circ}\cdot6 \left\{ \begin{array}{ll} \text{sp. grav. of sulphomethylate of potassium} & = 2\cdot097, \\ \text{,, ,, sulphoethylate of potassium} & = 1\cdot843, \\ \text{,, ,, sulphoamylate of potassium} & = 1\cdot144. \end{array} \right.$$

Accordingly the densities of the salts are in the inverse order of their molecular weights, and the ethyl compound is in this respect in its usual place between the amyl and methyl relatives.

Physical Laboratory, Science Schools,
South Kensington.

XVIII. *Preliminary Notice of a new Sunshine-Recorder.*

By HERBERT M'LEOD, *F.R.S.**

BEING somewhat doubtful of the accuracy of the published reports of the duration of sunshine, in the summer of 1880 I tried to devise some apparatus by which the light, instead of the heat of the sun, would be used to produce the record of sunshine. Several trials were made; and in some of them clockwork was employed to move strips of sensitive paper. The simplest form of apparatus I have recently tried again, using the ferroprussiate paper now much employed by engineers for copying tracings, and which is preferable to silver paper, first, in consequence of its

* Read June 28, 1884.

cheapness, and, secondly, because of the ease with which the image is fixed, as for this purpose washing in water is sufficient.

The apparatus consists of a camera so fixed that its axis is parallel to the polar axis of the earth, the lens pointing northwards. Opposite the lens a silvered sphere is placed. The rays from the sun are reflected from the sphere through the lens of the camera on to the sensitive paper, on which a distorted image of the sun is formed; and the positions of the lens and sphere are so arranged that the image is a linear one and radial. By the motion of the earth the image is carried round in a circular arc, tracing a curve on the sensitive paper. In the instrument at present constructed, the sphere is a chemical round-bottomed flask silvered inside, and about 95 millim. in diameter; the distance from flask to lens is 76 millim., and from lens to sensitive paper 152 millim.; the lens has a focal length of 90 millim. and an effective aperture of 22 millim.

The circle traced by the sun in June is about 120 millim. in diameter. An impression is made on the paper by exposure for only 10 seconds; and when the lens is covered for one minute, a light line is produced in the circular band, so that the paper is sufficiently sensitive in the present apparatus to register short gleams of sunshine, and also the passage of small clouds. When the sun is shining through light clouds, an impression is produced on the paper, but somewhat blurred, and of a much less intense blue colour than is obtained by bright sunshine. The time-scale is made by drawing from the centre of the circular band radial lines, containing between them angles of 15° , each of which represents one hour of time.

It still remains to be found which are the most convenient dimensions for the globe and lens, so that the minimum of alteration of position will be requisite to obtain a sharp image during all times of the year; and also the best method of fixing the paper so that it may be easily changed and the time-scale marked on it.