

and pressure in certain regions of the corona are favourable not only for the production of the lines of a given element but also for the appearance of groups of lines which are not given by ordinary laboratory methods of excitation.

A more detailed presentation will appear soon in the *Astrophysical Journal*.

IRA M. FREEMAN.
Ryerson Physical Laboratory,
University of Chicago.
Jan. 5.

A Simple Rainfall Law.

I HAVE recently prepared statistics giving the maximum total rain falling on any n consecutive days, for selected stations in Ceylon, and over certain periods. These figures, with a discussion, are being published as a paper, "Heavy Rainfall in Ceylon," in the *Transactions of the Engineering Association of Ceylon* for 1927.

In the course of this investigation I discovered a very simple law, which Ceylon rainfall seems to follow very closely, but which, so far as I am aware, has not been pointed out elsewhere.

Consider the maximum value of the total rain falling in n consecutive days during any one year. Let R represent the mean of a number of such values for different years; then, if this mean is taken over a sufficient number of years, we have

$$R = Qn^K,$$

where Q and K are constants for any particular station and period of years, and n is small. This formula holds with remarkable accuracy, when the means are taken over, say, 40 years or more.

In the table below, figures are given for four stations. The first row for each station gives R , the

| STATION. | $n =$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Q | K |
|----------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Avisswella (47 years) | Actual mean maxima | 5.89 | 8.16 | 9.66 | 11.20 | 12.59 | 13.94 | 15.17 | 16.13 | 17.15 | 18.09 | | |
| | Theoretical mean maxima, = Qn^K | 5.68 | 8.05 | 9.87 | 11.40 | 12.75 | 13.97 | 15.10 | 16.15 | 17.12 | 18.06 | 5.68 | 0.502 |
| | Percentage excess of actual | +3.6 | +1.4 | -2.1 | -1.8 | -1.3 | -0.2 | +0.5 | -0.1 | +0.2 | +0.2 | .. | .. |
| Haldummulla (40 years) | Actual mean maxima | 4.64 | 6.46 | 7.97 | 9.26 | 10.46 | 11.46 | 12.42 | 13.10 | 14.08 | 14.84 | | |
| | Theoretical mean maxima, = Qn^K | 4.58 | 6.52 | 8.02 | 9.29 | 10.40 | 11.42 | 12.35 | 13.23 | 14.04 | 14.83 | 4.58 | 0.510 |
| | Percentage excess of actual | +1.3 | -0.9 | -0.6 | -0.3 | +0.6 | +0.3 | +0.6 | -1.0 | +0.3 | +0.1 | .. | .. |
| St. Martin's (37 years) | Actual mean maxima | 10.34 | 15.38 | 19.16 | 21.54 | 24.31 | 27.00 | 29.21 | 31.34 | 33.45 | 34.97 | | |
| | Theoretical mean maxima, = Qn^K | 10.54 | 15.15 | 18.74 | 21.78 | 24.47 | 26.92 | 29.17 | 31.30 | 33.27 | 35.16 | 10.54 | 0.523 |
| | Percentage excess of actual | -2.0 | +1.5 | +2.3 | -1.1 | -0.7 | +0.3 | +0.1 | +0.1 | +0.5 | -0.5 | .. | .. |
| Jaffna (56 years) | Actual mean maxima | 5.17 | 6.95 | 7.93 | 8.78 | 9.53 | 10.24 | 10.93 | 11.42 | 11.88 | 12.45 | | |
| | Theoretical mean maxima, = Qn^K | 5.24 | 6.79 | 7.91 | 8.81 | 9.58 | 10.26 | 10.87 | 11.42 | 11.94 | 12.42 | 5.24 | 0.375 |
| | Percentage excess of actual | -1.4 | +2.3 | +0.2 | -0.3 | -0.5 | -0.2 | +0.5 | 0.0 | -0.5 | +0.2 | .. | .. |

actual mean yearly maximum rainfall, in inches, extracted from the daily records of that station.

The columns headed Q and K give the constants deduced from these straight lines, while the second row for each station gives values of Qn^K , computed from these constants. The third row gives the percentage excess of the first row over the second, and it will be seen that the agreement is remarkably close.

As the stations examined represent a considerable diversity of rainfall types, depressional, north-east monsoon, south-west monsoon, and diurnal local circulation, it seems probable that this is a general law, universally applicable, in which case it affords a means of classifying rainfall by two numbers only. Such a simple numerical classification may be of value in regional studies of precipitation.

I have submitted a paper on this subject to the *Ceylon Journal of Science*, and this will appear in the next issue of Section E, while further investigations on the variations of K and Q , over Ceylon, will be undertaken.

H. JAMESON.
Colombo Observatory,
Dec. 27.

The Two Calories.

I HAVE read with appreciation Mr. Marks's letter in NATURE of Jan. 14. May I recall that fifty-seven years ago Thomas Muir, the mathematician (now Sir Thomas Muir), suggested the names therm and kilotherm for them (see NATURE, vol. I, p. 606). Since then the Gas Companies have appropriated the name therm and defined it as 100,000 British Thermal Units. It seems to me that from the scientific, the engineering, and the practical points of view, the best units for heat are the kilowatt-hour, its multiples and sub-multiples.

ALEXANDER RUSSELL.
Faraday House,
Southampton Row, W.C.1.

THE confusion between the two calories referred to by Mr. Marks in NATURE of Jan. 14 would be made worse by his suggestion that the kilogram calorie should be written as K calorie, since it could then be confused with the so-called Ostwald calorie—a unit which should never be used and is now obsolete, because the latter is denoted by K . The matter of differentiating between the gram and kilogram calories was considered by the Bureau of Chemical Abstracts some little time ago, and the chairman of the board, Prof. J. C. Philip, informs me that it was decided to use 'g. cal.' and 'k. cal.' for the two units. It is highly desirable that this method should be generally adopted, since much confusion and even error is undoubtedly caused by the use of 'cal.' and 'Cal.' The question of the unit calorie, whether 15° or 20°, etc., adds a further source of confusion to very accurate work, and when this is known it may be

stated as a suffix, say g. cal.₁₅, as is also done by the Bureau of Chemical Abstracts.

The whole matter of physico-chemical symbols was considered some time ago by a small committee of the Chemical Society, of which I was a member, and some trouble was taken with it. The results, however, which were handed over to some international body or other, have disappeared without trace.

J. R. PARTINGTON.
Kingsbury Close,
London, N.W.9.

A Proposed Biological Flora of Britain.

In the preface to the first edition of the "Students' Flora," published in 1870, Sir Joseph Hooker expressed the hope of being able to undertake a companion volume in which "the physiological and morphological observations" on British species should be recorded. Ever since that time this idea has been in the minds of botanists, but so far no serious attempt has been made to bring the project to fruition.

Such aut-ecological data are of great value, not only