

of the surrounding air, it appears that the phenomenon is due only to the effect of atmospheric condition and composition.

It would be worth while, therefore, to collect data concerning the height and velocity of meteors along their tracks of *maximum* visibility, as distinct from their entire visible courses.

Meteors seen with very long streaks are doubtless those that move more or less horizontally, the major part of their journey being accomplished in the region of right density and composition.

It is common knowledge that only the brighter meteors have more or less persistent trains. This may be due to the 'gas-mantle' surrounding them, which gives them a higher luminosity and the air left in their tracks greater facility of ionization.

Meteors of low luminosity that appear as reddish (or reddish-white) specks, moving generally with small apparent velocity, rarely, if ever, develop persistent trains. Their tracks probably lie above the region of appropriate density and composition.

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### Curve Fitting

IN *Biometrika*, 28, 34-59, the late Prof. Karl Pearson published a severe criticism of some work on curve fitting by the Indian statistician, R. S. Koshal. Since the criticism, if taken at its face value, is likely to injure the reputation and prospects of Mr. Koshal, I take this opportunity to point out that in the table (p. 44) in which Pearson contrasts his results with those of Koshal, much to the latter's disadvantage, Pearson's theoretical frequencies, said to be derived from his equation ( $v$ ), are seriously in error. In consequence, his equation is made to appear to be a closer fit than that obtained by Koshal, although in reality it does not fit the data so well.

In this letter I cannot deal with the numerous points of Pearson's criticism. It is only fair, however, to recognize that it was evidently written under a misapprehension of the numerical values he was discussing.

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### Points from Foregoing Letters

PROF. H. A. HARRIS puts forward the view that the even-toed ungulates are not so highly specialized as would appear to be the case in view of the reduction of the digits to two and the absence of a clavicle. In the sheep embryo, a clavicle appears and various additional digits in the fore and hind foot. These are rapidly lost, either by absorption as in the case of the clavicle, or by incorporation in the neighbouring bony elements. The second and fifth metatarsals are buried in the substance of the rapidly growing third and fourth, which fuse to form the cannon bone.

Sir Joseph Larmor suggests that the potency of a minute amount of active principle from liver extract in staving off pernicious anaemia, may be accounted for on the supposition that the active principle is arrested in the affected lumbar bone marrow which, under normal conditions, is the seat of production of red blood corpuscles, and that it restores to it for a while its function.

Prof. W. T. David agrees with Prof. W. A. Bone that during the passage of a flame through an inflammable gaseous mixture the initial slow movement is accompanied by 'incomplete combustion'. He stipulates, however, that this incomplete combustion does not imply incomplete combination, but indicates that a certain amount of 'latent energy' formed in the flame front is left behind in the flame gases. This assumption he considers to be necessary in order to account for the duration of the afterglow of the inflamed gases, seen in wide tubes.

Recent observations of the spectra of northern lights (both 'red' and 'sunlit' auroras) indicate, according to Prof. L. Vegard, that the night temperature in the auroral region is  $-30^{\circ}$  to  $-47^{\circ}$  C. Therefore, he concludes, any inferred decrease in the density of the atmosphere from 100 km. upward cannot be accounted for by an increase in tempera-

ture; it may, however, be due to the presence of electrons and of free atoms, which would be equivalent to a decrease in the average molecular weight. Prof. Vegard finds, further, that under certain conditions the intensity of the red line (6300 A.) relative to the green line (5577 A.), increases upwards, and recalls his previous suggestion that the enhancement of the red line is due to the action of 'activated nitrogen' upon ozone molecules.

F. Hope-Jones describes a new clock showing simultaneously mean and sidereal time. With the help of a more accurate value for the ratio between the solar and the secular day, calculated by Dr. L. J. Comrie, and with a corresponding train of gears in the ratio  $\frac{45 \times 71 \times 257}{29 \times 151 \times 187}$ , the clock error has been reduced to one second in about 100,000 years and, by means of a simple device, the problem of giving dead-beat seconds hands on both dials has been solved.

Features concerning the stability of the spiral sinusoidal forms assumed by threads under rotation are described by H. W. Hall. Conditions of rotation for three cases have been examined; in the first two, fixed lengths loaded by weights were used, and, in the third, the thread was withdrawn vertically at high speeds from a stationary bobbin. Examination with stroboscopic illumination showed that in air and under all conditions imposed, the thread spirals through an angle  $\pi$  for each complete loop.

New determinations of the ascorbic acid (vitamin C) in cauliflower and potato, carried out by Dr. L. F. Levy, employing several methods of extraction, lend support to the hypothesis that the ascorbic acid exists partly in a combined state and is freed during boiling. On the other hand, oxidases which are active during the boiling process reduce the amount of ascorbic acid.