

direction, and so to draw our attention away from the serious dangers. In fact, we agree . . . that a man may improve his reasoning habits by studying logic, but we would lay rather more stress on the condition, 'if he has the sense to know when formalities are out of place.' Mr. Sidgwick sketches the main points of his objections to the scholastic logic in a way which can be easily followed; and in his last chapter, on "How Logic might be Taught," he gives a succinct and simple explanation of the main processes which are employed in reasonable hinking.

*Holidays in Eastern Counties.* Edited by Percy Lindley. Pp. 96. (London: 30 Fleet Street, E.C.)

IT would be easy to select many places in which to spend a restful holiday from those described and attractively illustrated in this guide-book. The eastern counties possess many points of interest to students of nature and archæology, and are worth exploration in the days of leisure.

#### LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

##### A Vertical Light-beam through the Setting Sun.

THE not very frequently observed appearance of a vertical pillar of light through the sun when nearly setting was so very remarkably distinct and bright this evening as to deserve, perhaps, a particular description. I observed it in the Victoria Park, near Hackney, in the north-eastern part of London, from about 7h. 30m. to 8h. 10m. p.m. The setting sun at the first of those times was about 7° or 8° above the horizon, and its light was but little dimmed and tinged with yellow yet, by faint cirro-stratus cloud-bands among which it was shining, which ruled the western sky obliquely downwards towards a point of the horizon about 45° northwards from the sun. The light-column then, when I first saw it, was yellow coloured, bright and narrow at the base, but more diffused above, where it could be traced up to a length of 5° or 6°, while its base rested upon, or extended very little, if at all, below the sun. The summit grew narrower and higher as the sun descended lower, while the base became brighter and followed the sun down until, at about ten or fifteen minutes to 8, the sun was much dulled in light and assumed an orange yellow colour in entering a bank of haze about 5° from the horizon. Below that altitude the light-column's base never descended; but when at about 8 p.m. the sun had acquired the magnificent appearance of a great crimson disc, still about 2°, or some four of its diameters, clear from the level park horizon, the tall column shone beautifully above it as a perfectly straight, vertical, narrow streak of light about the sun's apparent diameter in width and 8° or 10° in length (from about altitude 5° to altitude 15°, and very faintly rather higher), bright yellow at its base, but becoming insensibly whiter and dimmer, without lateral diffusion till lost across the faint cloud-streaks which seemed here and there just visibly to lengthen it and very faintly extend it somewhat higher. It shortened gradually, and died out at last about 8h. 10m. p.m., soon after the sun itself vanished in the haze before reaching the horizon, but without changing the altitude, about 5°, of its base; and it retained to the last the straight, vertical appearance of which many of the vast number of people enjoying the fine evening in the extensive park were admiring watchers. I noticed no horizontal belt of light through the sun, nor mock-suns at their usual distances on its right and left hands, where the bands of cirro-stratus yet extended far enough to have given rise to them if they had consisted of cloud-materials of a fit and suitable description to produce them; and nothing very notable, except the vertical light-beam across the streaky clouds and the sun's intensely red-coloured orb below it, seemed to be of very marked meteorological significance in the beautiful display.

It seems hardly doubtful that the vertical light-beam must proceed in some way from passage of the sun's nearly level rays through horizontal refracting surfaces, such as those, for example, of thin, flat, hexagonal snow-crystals. A natural tendency which

such floating crystals and collections of them into flat snow-flakes possess, in fact, of remaining horizontal while falling through perfectly still air, as flat leaves of paper, especially symmetrically shaped ones, if started horizontal on their journeys also may be seen to do,<sup>1</sup> affords fair grounds for an assumption that the sun's slightly sloping rays are really dispersed into these observed vertical light-beams by passing through the horizontal faces of such thin, flat, floating crystals. In what further way the light is spread upwards and downwards in passing through the thin transparent plates seems, indeed, to be a rather more doubtful subject of conjecture; but either want of perfect parallelism of the plates' flat surfaces, perhaps through partial melting, or refractions through the thin plates' bounding faces which give them chisel-edges, supposing these edges to be also slightly rounded off by partial melting, would certainly suffice, in the large proportion of a snow-cloud's floating crystals which optical considerations show must always be suitably oriented to produce refractions of the sun's rays upwards or downwards in directions either vertical or as nearly vertical as possible, to account for the columnar light-beam's well-defined extension in a vertical direction. Yet for better insight into its origin and surer proofs of the correctness of its theoretical explanation, fresh attention to the features and meteorological circumstances of the beam's display when it is well developed would certainly be desirable, and of great value to increase and improve our knowledge of this rather rare and singular form of halo, or occasional form of cloud illumination by the sun and moon. A light north-west wind was blowing on the ground, and the sky seemed to be dimmed by the faint streaks of cirro-stratus only in that quarter of the horizon where the slender beam of yellow light was visible; but the air might easily be quite calm and motionless aloft, in that thinly clouded region of its very high upper strata.

A. S. HERSHEL.

Observatory House, Slough, June 26.

##### A New Method of using Tuning-forks in Chronographic Measurements.

THE tuning-fork, when used for making time traces in chronographic work, is usually made to vibrate, by bowing with a violin bow, or by percussion, or by rapidly removing a metal block from between the two prongs, or by an electro-magnet the circuit of which is interrupted by the fork itself. When many details have to be attended to in an experiment, the first-mentioned methods are inconvenient, and the last one, namely the electrical, is not without an element of error. In order to obtain the convenience of the electrical method without introducing the error due to the electrical driving of the fork, two forks of the same period are used; the fork which makes the trace is furnished with an electromagnet, but no contact-breaker, the current being controlled by the second fork, which has a contact-breaker. This method of driving a chronographic fork is well known. My new way of using this combination is to cause the chronograph, during the short period during which the records are made, to cut out entirely the electrical circuit from the fork used to make the time trace and to close the circuit again immediately after the records are made. By this means the recording fork is not hampered with a contact-breaker, nor is it subject to the influence due to the electro-magnet, while its trace is being made on the moving surface of the chronograph. After the time trace is made, the circuit is again established, so that the vibration is maintained, and the fork is ready for the next experiment.

Trinity College, Oxford, June 28. F. J. JERVIS-SMITH.

##### Long-tailed Japanese Fowls.

WITH reference to Mr. J. T. Cunningham's letter on these birds in NATURE of June 13, I should like to be allowed to point out that the very interesting evidence he gives is yet not sufficient to prove his point. The words of his correspondent do not necessarily imply that he had personally witnessed the manipulation part of the process adopted to secure extreme length of

<sup>1</sup> This is a rather surprising experiment to those who may have been accustomed, as I have always been used hitherto, to see paper clippings, when tossed up at random, pirouette like little windmills or teetotums in falling through the air. But held by a corner for a moment, out of draughts, horizontal, if the hand's support is withdrawn quickly, letting them go at the same time without any impulse, squares, circles, hexagons, or other small cuttings of flat paper will all be found to fall to the ground from any height with very little oscillation, or even sometimes remaining throughout their fall quite horizontal.