

An Optical Illusion

IN the course of some cinematographic tests, I observed a visual effect which may be of some interest to readers of NATURE and is probably open to a ready explanation.

A cage consisting of two bright wire rings crossing at right angles and about 8 in. in diameter was rotated about its polar axis, at varying speeds. The object was to produce a bubble-like appearance on a film. During rotation three optically black lines appeared, one apparently reaching from pole to pole in a straight line and the other two stretching from pole to pole in right and left hand curves. It is obvious that these dark lines are caused by the passage of the parallels of longitude across each

other; thus the vertical line appears when one circle is edge on to the line of sight, and the curved lines when rotation through 45° from that position has occurred.

I should value an explanation of the cause of the lines. It is probably needless to add that they do not show on the cinematograph film. The lines are seen quite distinctly at low speeds—even oscillating the cage with the fingers—and in any light. A spot light and dark background gives the best effect.

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Points from Foregoing Letters

S. Kownacki and J. A. Ratcliffe outline a method for investigating 'electron-inertia' effects in thermionic tubes. They point out that if positive ions of atomic mass are used instead of electrons, the frequencies involved are very much smaller and more manageable. They have investigated some 'electron-resonance' effects with tubes in which positive ion emitters were used, and the frequencies involved were about 5×10^6 and 10^6 c./sec. when caesium and lithium ions respectively were used.

Sir Arthur Keith, after examining a cast of the South African 'Florisbad' skull, concludes that it is an important evolutionary link indicating that South Africa, like Java, has been an independent centre of development from a sub-human form to the modern Bushman and Hottentot.

Prof. C. N. Hinshelwood differs strongly from Prof. Travers in the interpretation of the kinetics of certain gaseous organic reactions, and gives as an example data obtained by Seddon and Travers for the decomposition of acetaldehyde at 400°, from which he would draw quite different conclusions.

An electron-counting device based upon the secondary emission principle has been constructed by Prof. Z. Bay. It does not involve cooling in liquid air to suppress thermal ionization, but utilizes a very thin layer of barium oxide on a nickel base with a high 'work function', and a ten-stage multiplier which gives a ten thousand fold increase. The instrument has a resolving ability which greatly surpasses that of the gas-filled counters.

When negative ions are formed at metal surfaces by bombardment with positive ions, the resulting negative ions need not be of the same element as the bombarding positive ions, according to Dr. F. L. Arnot and C. Beckett. As an example, they describe experiments showing that positive mercury ions may produce negative oxygen ions.

The exchange of hydrogen atoms between secondary alcohols and ketones, or similar compounds, under the influence of ultra-violet light (a reaction important also in the photochemistry of ergosterol) has been investigated by Ch. Weizmann, Y. Hirshberg and Dr. E. Bergmann. They consider that it comes about through the activation of the carbonyl group, CO, which afterwards reacts with the secondary alcohol group, splitting the C—H bond, and giving two free radicals which may either join together or be stabilized by a second oxidation-reduction process.

The fact that mitoses occur in follicles of rats some time after hypophysectomy leads Dr. J. Freud to the view that follicular growth is perhaps only indirectly dependent on the pituitary. It is assumed that the pituitary produces a hormone causing growth of eggs. When the egg volume reaches twenty-five times the original, the production of a hormone by the egg itself becomes apparent by the mitogenic response of the follicle. The folliculogenic hormone is therefore not of pituitary origin but is produced in the egg-cell.

Histamine hydrochloride injected into white mice is found by Dr. F. Ellinger to decrease the body weight in the same way as irradiation with ultra-violet light. He considers that histamine exerts its action by stimulating the thyroid gland.

Several stages in the development of the giant salivary gland nuclei in the fruit fly, *D. repleta*, are described and illustrated by S. L. Frolova. She finds that all resting nuclei in the larvæ and imago of *Drosophila* are alike and do not differ from the spireme-like salivary nuclei.

From new determinations of the true specific heat of potassium and lithium, together with previously known values for lithium and sodium, L. G. Carpenter, T. F. Harle and C. J. Steward have drawn curves showing that the abnormal rise of specific heat, extending over a considerable range below the melting point, is common to these three alkali elements.

A new technique for the calibration of microphones, by substituting in the 'free field' a search tube of small diameter connected to a condenser microphone, is described by A. J. King and C. R. Maguire.

Dr. T. F. Wall finds that the magnetic permeability of an iron wire is notably increased when covered with a thin coating (about 0.002 in.) of manganese.

A redetermination of the viscosity of air by Dr. G. B. Banerjee and B. Pattanaik gives a value of $1.833 \cdot 3 \times 10^7$ c.c.s. units, which when introduced in Millikan's data from his oil-drop experiment, gives a value of 4.811 for the electronic charge, in close agreement with the value obtained from X-ray experiments.

Dr. R. Schmid and collaborators have identified in the Al I spectrum a $^4P \rightarrow ^4P$ transition, which necessitates the dropping of a previously accepted 2D term.