

The Apparent Size of the Sun

THE illusion described by Dr. Vaughan Cornish in NATURE of December 25, 1937 (140, 1082) can be seen if the sun is looked at for an instant and then the observer turns and looks towards the horizon. An after-image will be seen. Carry this up in the sky, and it will be seen to shrink.

Another trick to play with this after-image is to stare at the setting sun; shut your eyes and turn them through about ten or fifteen degrees; open them and turn them slowly and *as regularly as possible* towards the sun and beyond it. The after-image will not be a streak but a row of separate images.

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Greystones,
Teffont,
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Jan. 1.

Axial Spin and Weapons of the Ancients

I THINK the answer to Mr. L. J. D. Richardson's query¹, "Does an arrow rotate?", is that some do and some do not.

A toxophilite may assure us that, by the feathering of his arrows, a slow rotary motion is imparted, and, from an examination of some modern examples, it would appear to be a just claim. But there is no evidence that the arrows of the ancients closely resembled the modern types. Many of the flint heads of great antiquity are of such a shape and size that their use would be likely to prevent sustained rotation and, as is well known, the feathers may be tied to, as well as inserted in, the butt-end. Sometimes pieces of leaf or skin were used in place of feathers, so that there was diversity of type as well as crudeness in construction.

In the crude examples, the feathering could serve only as resistance to that portion in rear of the centre of gravity, as Sir Gilbert Walker states, but I should prefer to describe it as a definite aeronautical device whereby any deviation from the true flight path was automatically corrected by reason of the fact that some of the surfaces (there were usually three set at angles of 120° to one another) were presented to the air at an angle and a righting force thus exerted.

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¹ NATURE, 140, 1016, Dec. 11, 1937.

Points from Foregoing Letters

A NEW device for obtaining photographs of lightning in daylight is described by Dr. B. F. J. Schonland. The electromagnetic pulsations sent out by the 'leader' stroke which initiates the lightning discharge are picked up by an aerial circuit and used to pull a trigger opening the camera shutter. The lag is less than 0.005 sec., so that the shutter is open before the first return stroke of the lightning occurs.

Drs. H. von Halban and H. Paxton have found evidence of broadening of the absorption line for slow neutrons in silver when the absorber is heated. This effect is identified with the Doppler broadening resulting from the thermal motion of the capturing nuclei.

No change in temperature (Thomson effect) is observed at a given point in a supraconductor in which a temperature gradient exists, when a current is reversed, according to Dr. J. G. Daunt and Dr. K. Mendelssohn. The authors suggest that this, together with the fact that the specific heat is not zero, indicate that, in general, electrons in a supraconductive metal exchange thermal energy with the lattice, whereas those taking part in a persistent current do not.

Dr. N. Kemmer suggests a modification of Yukawa's theory of the nuclear field which, it is claimed, describes completely the known exchange character of nuclear forces as well as their range and magnitude.

On the same subject, Dr. H. J. Bhabha gives equations and describes the properties of 'U-particles' bearing positive charge and having a mass about 200 times that of an electron. The existence of a neutral particle *N*, of the same mass, is also allowed for, so that nuclear physics would then have three symmetrical groups of particles, each having a neutral, a positive and a negative constituent. The particles of the first group have mass equal to that of an electron, those of the second group being 200 times heavier, and the third group (protons and neutrons) 1,840 times heavier than the electron.

Further evidence that the cortical and cuticular cells in the wool fibre contain more sulphur than the total wool (from which they are obtained by the action of trypsin) is adduced by Dr. J. B. Speakman and Dr. P. R. McMahan. This indicates that the intercellular phase contains less sulphur than the cells.

K. V. Giri reports that in a system containing vitamin C, glycerophosphate and phosphatase, when the vitamin C is oxidized by metallic catalysts like copper ions and other oxidizing agents the activity of the phosphatase is inhibited. Glutathione and other reducing agents remove this inhibition.

A group of workers from the University of California presents results, obtained with radioactive phosphorus as indicator, showing that phospholipids are synthesized by surviving liver, intestine and kidney.

J. B. Loughnane and Dr. Paul Murphy report that they have obtained free transmission of potato virus X by leaf contact especially under the influence of air currents, and they suggest that this explains the ubiquity of this virus, the distribution of which probably does not depend on biological agents.

Serious effects of infestation of Canadian spruce forests by the sawfly, *Diprion polytomum*, and steps taken for its control, are reported by Dr. S. G. Smith. The Canadian variety of sawfly differs from the European in that the unfertilized eggs give rise to females instead of males. Also the basic chromosome number is seven instead of six. The author suggests that the Canadian variety may exist in small numbers in Europe, whence it may have been introduced into Canada.

From hydrodynamic relations between internal friction and particle size and from observations on double refraction of flow, R. Signer, Prof. T. Caspersen and Prof. E. Hammarsten deduce that the molecules of sodium thymonucleate, a constituent of chromosomes, have, in solution, the form of thin rods, and a molecular weight of between 500,000 and 1,000,000.