

II. Those of which the left half is the mirror image of the right half.

III. Those of which the upper half is the mirror image of the lower half.

IV. Letters which can be rotated over half a circle without changing; they remain the same when the page is turned upside down.

V. Letters which have all the above characteristics combined.

What stands out in this classification is that the letters *N*, *S* and *Z* are together in one group. They are just the characters which are always written

incorrectly by uneducated people. It seems, therefore, that their type of rotation symmetry is slightly more difficult to grasp than the more common reflection symmetry. In this connexion it may be noted that many of the magic symbols used by ancient people possess such rotation symmetry over a half, a third or a quarter of a circle. This may perhaps help to understand why various primitive tribes independently have come to worship symbols like the swastika.

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### Points from Foregoing Letters

PROF. E. A. MILNE relates considerations recently advanced by Dirac with his own results, but concludes that there is no inference as to the creation of matter. The form of the differential relation connecting intervals for the  $t \rightarrow \tau$  transformation is stated.

Under very feeble illumination the eye sees the visible spectrum in a uniformly grey colour (scotopic vision). It had been found that the maximum luminosity for equal energy is at 5000–5040 Å., while the maximum absorption of the visual purple pigment in the eye is at 5100 Å. Dr. H. J. A. Dartnall and C. F. Goodeve point out that if instead of comparing energies one compares equal quantum intensities, then the two maxima coincide. They consider this, and also further approximate calculations of the relative intensities of the light absorbed at different wave-lengths, to give support to the hypothesis that the primary process in scotopic vision is the absorption of light quanta by visual purple.

Recent experiments on the resistance of ferromagnetics show a sharper Curie point than the specific heat measurements. Prof. N. F. Mott and Dr. H. H. Potter state that this is to be expected, because the resistance depends on long-range order (domain of more than about 8,000 atoms) and the magnetic energy depends on the interaction of electronic spins at close range.

The percentage of glutamic and aspartic acids in Cotswold wool and in seagull quill has been determined by Dr. J. B. Speakman and F. Townend. They conclude that the results support the 'salt-linkage' theory developed by Speakman to account for the elastic properties of wool-fibres in solutions of varying acidity. According to that theory, the long peptide chains of the keratin molecule are bridged by linkages arising from the combination of the acid side-chains of aspartic and glutamic acids, with the basic side-chains of arginine, lysine and histidine.

A study of spore-forming bacilli by a vital staining technique leads Dr. L. A. Allen, Miss J. C. Appleby and J. Wolf to the conclusions: (1) that a single species of bacillus may show alternative methods of forming endospores, resulting in two different cell structures extraneous to the spore; (2) that the spores, after being released from the cells, are at first refractile, but may later (in old cultures) take up stain, revealing an internal structure which undergoes rearrangement during a considerable period of time.

The ovary and testis of young and embryonic rats and mice have been grown *in vitro* by P. N. Martinovitch. The ova developed and survived for three weeks, but at the end of a month the whole organ degenerated. Spermatogenesis was less successful, stopping at the pachytene phase during the chromosome reduction stage during meiosis.

Some of the changes taking place when the larvæ of the oyster settle and become 'spat' are described by H. A. Cole. Within ninety hours a considerable metamorphosis occurs while the diameter of the shell increases from 0.3 mm. to 0.6 mm. There is still a gap in the life-history of the oyster, since the next stage described is one in which the diameter of the shell has reached 1.2 mm.

It is suggested by Dr. J. R. Baker that the breeding seasons of equatorial birds may be controlled by changes in the intensity of visible and ultra-violet illumination.

Lieut.-Colonel L. M. Davies finds evidence that the Ranikot (Palæocene) Sea of India extended from Sind to the Tirah, and from the Tirah to Tibet. It was apparently isolated from the contemporary marine waters of Europe.

A. M. Hocart adduces a few examples and impressions of lineages which voluntarily isolate themselves for breeding purposes. These he considers give a clue to the segregation of species in Nature.

From recent observations by Rossi and Benedetti, H. J. Bhabha infers that the number of cosmic particles arising from a direction 30° west of the meridian is appreciably less than the number arriving vertically. These, he reasons, must be negatively charged, and if the radiation formulæ of quantum mechanics hold for the high energies involved, then either negative protons or some other negatively charged particles hitherto unknown must be assumed to be present in appreciable numbers in cosmic radiation.

An effect of increased resolving power of telescopes and microscopes produced by means of reduced light intensity in some diffraction experiments is described by Dr. K. B. Merling-Eisenberg.

S. G. Gibbons and J. H. Fraser have experimented with a modern high-speed centrifugal pump for collecting plankton, and find that even delicate organisms are undamaged. They claim that accuracy is obtained by this quantitative method of sampling.