

observations but he also uses language so ambiguous that it is scarcely possible to guess what he means. Thus, he concludes that the process of combustion is "autocatalytic." This sounds very learned. The statement must carry profound conviction and endless joy to the 'anti-knock' soul. Yet, what does it mean, how will it help us to make the internal combustion engine efficient? 'Catalytic' is one of those blessed words which carry no particular meaning—the shibboleth of the day, lisped in every scientific nursery. At least three special perambulators have been chartered to carry the infant catalysis 'hopping' in chemists' gardens: yet neither the Cambridge nor the Princeton nor the Johns Hopkins nurse can tell us what mission the baby is bawling. I see the note dates from Oxford. Looking this up in my Gazetteer, I find: A place where grass grows and dictionaries are made, but the meanings of words are not calculated in use. Then, in the new volume of the "Dictionary of National Biography," I find the statement made of the late Lord Rayleigh: "There still lingers in Cambridge a tradition as to the lucidity and literary finish of his answers in this examination [the Mathematical Tripos]. Every paper he wrote, even on the most abstruse subject, is a model of clearness and simplicity of diction." When we can say this of the papers we write on combustion, perhaps we shall begin at least to know where we are not.

HENRY E. ARMSTRONG.

Movements of the Lower Jaw of Cattle during Mastication.

AMONG the biological phenomena exhibiting a definite sense of rotation, as, for example, the growth of certain creepers and of the shells of snails, one that does not seem to have been studied and to which we wish to direct attention here, is the masticating motion of cattle. Close investigation shows that the lower jaw of the animal is displaced with respect to the upper jaw, not in a purely horizontal or a purely vertical direction, but simultaneously in both directions with such a phase difference that a clearly evident rotation results. Theoretically this can, of course, take place in two senses, and observation teaches that both possibilities are realised in Nature. Taking the direction of the food as positive, we shall denote as right- and left-circular cows those of which the chewing motion, viewed from the front, turns clockwise and counterclockwise respectively.

This nomenclature is based on the tacit assumption that one and the same cow always maintains its sense of rotation. We could confirm this by a limited number of observations but are aware that more complete data, extending over longer periods of time, are necessary definitely to settle this point. Statistical investigations on cows distributed over the northern part of Sjælland, Denmark, led to the result that about fifty-five per cent. were right-circular, the rest left-circular animals. As one sees, the ratio of the two kinds is approximately unity. The number of observations was, however, scarcely sufficient to make sure if the deviation from unity is real. Naturally these determinations allow no generalisation with regard to cows of different nationality.

The fact that both senses of rotation are realised raises the question if simple laws govern the hereditary transmission of the property referred to. Concerning the snails mentioned above, one knows that Mendel's laws in their simplest form apply, while in most other cases the actual occurrence of only one sense of rotation makes such investigations impossible. Particularly it would be interesting to ascertain which of the two modifications is the dominating one. We

are, unfortunately, not in a position to bring evidence on this important point, but believe that those having a more intimate acquaintance with cattle will find it easy to give an answer.

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Polarisation Effects in Measuring Electrostatic Fields.

IN listening to a lecture by Dr. Aston, in which the mass spectrograph was described, the writer was interested to hear that a polarisation of the plates of the condenser determining the electrostatic deflexion of the positive rays affected the field to such an extent to be one of the causes which made it necessary to recur to relative measurements in interpreting the results. Dr. Aston mentioned that the effect could be reduced by gilding the plates.

A few years ago attention had been centred on these polarisation or double layer effects in connexion with X-rays, in discussing the question how far such a layer formed under the influence of the electronic bombardment of the anticathode might affect the velocity of the electrons reaching the target. It is remarkable that they are so prominent in positive ray experiments, where the cathodic bombardment cannot be intense.

In Dr. Aston's determinations the polarisation was a disturbance, which he was able to trace in his results and to eliminate entirely.

Few physicists are in this fortunate position and to the writer it seems of interest to direct attention to the fact that, so long as no greater knowledge as to the conditions determining the magnitude of these polarisation effects is obtained, they constitute a particular source of error, which is but too easily overlooked in a number of cases where the production of stray rays cannot be eliminated, for example, in the determination of e/m for the electron according to some classical methods.

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Manchester, Nov. 12.

Biology and Birth-Control.

IT would interest me, and possibly some of your readers, if the writer of the review of my "Right of the Unborn Child" in NATURE of Nov. 5 would cite the sentences in which, according to him, I make "contemptuous remarks about God." KARL PEARSON.

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London, W.C.1.

THE answer to Prof. Pearson's question is that he quoted with approval, as expressive of his meaning, J. C. Squire's lines, including "'Good God!' said God, 'I've got my task cut out.'" This seems to me contemptuous, and even blasphemous.

E. W. MACBRIDE.

The 'Green Flash.'

REFERRING to page 728 of NATURE of Nov. 19, greenish appearances at sunset and sunrise may be due to various causes; but I am personally convinced that the sudden green flash, seen by some people when the last rim of the sun disappears behind a sharp horizon, is mainly physiological; for I see (if it can be called seeing) a momentary greenness when I switch off a bright lamp, with metallic filament, suspended above my bed.

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