If γ be the white vector, the third term represents the change in the sensation of saturation as we pass from the colour vector α to the colour vector β; and the second term gives the corresponding change in the sensation of hue. It is evident from the form of the curve in Maxwell's triangle that, on this representation, the peculiar shape of Helmholtz's differential insensitivity curve arises in connexion with variation of hue.

The representation of Q' as a sum of three logarithms is an extension of Fechner's law for brightness.

W. PEDDIE.

University College,
Dundee.

Parasitic Autotomy in Worms and its Possible Significance.

WHILE examining certain Enchytræid worms for the stages of two cœlomic gregarines having periods of infection at different times in the year, namely, spring and autumn respectively, I found that the cœlom quickly became free from cysts at the end of the life-cycle of each type.

During June and July of 1929 I kept six heavily infected worms in the laboratory for the purpose of allowing the parasites to attain a certain stage in development. In the first week in August four of these worms were removed for examination and the remaining two left in the soil. On examining the latter two weeks later (Aug. 24) I found that both had lost the posterior segments, while the cœlom of one was free from parasites and that of the other contained a single cyst only.

Autotomy caused by parasites has been described in Echinoderma and in Polychæta, and Hesse ("Contribution à l'étude des Monocystidées des Oligochètes", *Arch. Zool. Exp. et Gén.*, 1909, (5), III., p. 27 à 301) mentions it as a possible mode of dissemination of parasite spores from the cœlomic cavities of Oligochætes. Dr. Keilin (*Parasitology*, **17**, pp. 170-172; 1925) has observed parasitic autotomy to be one method of liberation of the spores of gregarines from the cœlom of such earthworms as *Allolobophora* and *Helodrilus*. In my specimens of Enchytræid worms, large phagocytic cysts such as Dr. Keilin describes are not formed, but the cysts of the gregarines do tend to mass together in the posterior region, and there they displace and press upon the intestine. I have seen heavily infected worms showing constriction of the body and have noted many instances of regeneration of the terminal segments, but until now have never obtained proof of the actual loss of this part of the body. Two results follow: first, the spores are shed into the soil, where they may be taken up by, and infect, other worms—a simple method of disseminating infection; and, secondly, the cœlom is cleared before the invasion by the other type of gregarine which enters it very soon after the cycle of the first is completed.

When the parasites are present in the head region, the cysts accumulate in the segments anterior to the reproductive organs. I have not had the opportunity of keeping such a specimen for any length of time, but have frequently observed very heavy infection in this region. Further, on several occasions I have found worms in which the head region was being regenerated, and have also seen two examples of a length of an Enchytræid worm regenerating both head and "tail". Perhaps parasitic autotomy occurs in the head region also?

MABEL FULLEGAR.

Natural History Department,
University College, Dundee, Oct. 24.

The Physical Identity of Enantiomers.

IT has always been stated that, apart from the sign of the rotation and the solubility of their salts with optically active bases or acids, the physical properties of dextro and lævo enantiomers are identical. In an investigation (*Jour. Chem. Soc.*, 1111; 1929) of certain physical properties of the liquid active and racemic esters of tartaric acid, it appeared that in the case of this series there is a great difference in the degree of association of the active and inactive forms. It is usual to attribute association to something of the nature of the 'a' factor of the van der Waals' equation, that is, to stray fields, free energy, etc., in the immediate neighbourhood of the molecule, and, when this action takes place between molecules of the same kind, it is thought to be physical rather than chemical in its nature. If, now, we suppose combination to have taken place between the dextro and lævo forms, energy will have been evolved, and the stray field reduced, with consequent decrease of the degree of association. This is the observed fact; the inactive form is less associated than the active.

In view of the above, and of the fact that the existence of racemic compounds in the solid state (in certain cases, at least) has never been doubted, it seems that chemical combination can take place between dextro and lævo forms, and that this action is different from that acting between molecules of the same form to produce association. Therefore, there must be a slight difference in chemical nature between the opposite active forms, since, if there were not, they would combine together to the same extent to which they combine (associate) with themselves. Finally, if there is a difference in chemical nature, there must also be a difference in physical properties. It has always been assumed that there is no difference, and, since the difference is no doubt slight between, for example, the freezing points of the dextro and lævo forms, it may very well have been overlooked or attributed to experimental error.

It is possible, however, to determine certain physical properties with very great accuracy, and an investigation directed, first towards the preparation of both active forms in a state of the highest purity, and, secondly, to the determination of such physical constants, for example, the freezing points, as are susceptible of very accurate determination, would perhaps yield results of great theoretical interest. In an investigation of this kind, the utmost care must be taken in purifying the materials, in drying thoroughly (and to the same extent in each case), etc. The freezing point, solubility, and specific rotation are properties which can be determined with great accuracy. I am investigating the physical constants of the esters, simple and substituted, of tartaric acid. In view, however, of the very great experimental difficulties involved in the preparation, and of the scepticism with which positive results may be received, it is very desirable that similar work on other series should be undertaken by other workers.

A. N. CAMPBELL.

Department of Chemistry,
University of Aberdeen.

Alternating Intensities in the Spectrum of Nitrogen.

THE rotational Raman bands excited by the λ2536 mercury line in nitrogen and hydrogen show the alternating intensities characteristic of a symmetrical molecule with a nuclear spin. In my communications on the subject (NATURE, May 18, 1929; *Proc. Nat. Acad. Sci.*, **15**, 515; 1929) I reported the lines