

of slope of the curve. This temperature was incorrectly held by many authors to be the freezing point.<sup>4</sup> In the present study I have definitely found that the freezing point is at 5.5°; at 5.7° nitrobenzene is distinctly liquid.

It is to be noted that the slope in the density temperature graph is the more interesting because at the same temperature of 9.5° the dielectric constant of nitrobenzene, as was shown previously by me, shows a very sharp decrease. Both this sharp change of the value of dielectric constant and the sharp change of slope in the density curve in the neighbourhood of 9.5° lead to the assumption that at this point nitrobenzene undergoes some, as yet not clearly understood, energy transformation.

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<sup>1</sup> NATURE, 126, 993, Dec. 27, 1930; and *C.R. Sci. Soc. Polon. de Physique*, 5, 3; 1931.

<sup>2</sup> *Comm. Leiden*, No. 170b.

<sup>3</sup> NATURE, 127, 270, Feb. 21, 1931; and *C.R. Sci. Soc. Polon. de Physique*, 5, 4; 1931.

<sup>4</sup> Landolt und Börnstein, "Tabellen".

### The Effect of X-Rays on Hair.

IN NATURE of May 2, Messrs. Asprey and Woods, writing on the subject of the molecular weights of proteins, mention that they have recently been doing some work on the effect of X-rays on the elastic and other properties of animal hair. They state that, after exposing unstretched wool for sixty hours to the full beam of a Shearcr X-ray tube, the fibres show many of the properties characteristic of wool which has been exposed in a stretched state to the action of steam. They refer the effect to the disruptive action of high-energy quanta on the length and adhesion of peptide chains, and mention that it must be closely related to the influence of various radiations on biological activity.

The accompanying photograph (Fig. 1) may be of

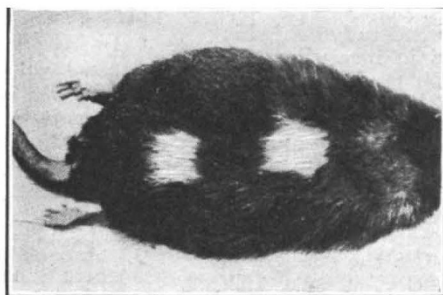


FIG. 1.

interest in this connexion, and is one which I showed a few years ago at a joint meeting of the Physical and Röntgen Societies. The photograph is of a black rat which has been exposed over two small areas of the back to X-rays generated in the region of about 150 kilovolts. Some weeks after the dose had been given, the hair fell out and the new hair which grew was devoid of pigment and considerably altered in texture, the normal straight hair of the animal being changed to a rather thinner fibre which appeared slightly curly. This result must, of course, be attributed to some action of the radiation upon the hair follicles, and the curliness of hair which regrows, once the surface has been epilated, is a not uncommon

observation in children where epilation of all the hair of the head has been purposely brought about. The doses in the cases mentioned are probably many times smaller than those mentioned by the authors.

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### Stellar Structure.

By an unaccountable slip, a numerical error crept into our recent communication<sup>1</sup> concerning the nuclei of planetary nebulae. With the assumed data for a typical nucleus, it is the superficial area which is 1/43 of the sun's. With mass equal to the sun, the mean density comes out 400 gm./cm.<sup>3</sup>, and with the probable mass 80 suns, as 32,000 gm./cm.<sup>3</sup>. This is still high enough to justify the classification of these stars with the white dwarfs; but degeneracy of the gas appears to be only beginning, rather than far advanced.

The suggestion that the nuclei of planetary nebulae are of high density and comparable in physical condition to the white dwarfs was made by Prof. D. H. Menzel,<sup>2</sup> who gave convincing arguments in favour of his position. We regret that we did not notice this in time to mention it in our letter.

The subject has also now been dealt with by Gerasimović.<sup>3</sup> It seems possible that further additions to the list of 'white' dwarfs which we gave may be made from among the *O* and *B* stars, in accordance with the suggestion of K. F. Bottlinger.<sup>4</sup>

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<sup>1</sup> NATURE, May 2, p. 661.

<sup>2</sup> *Publications Astron. Soc. Pac.*, 33, 302; 1926.

<sup>3</sup> *The Observatory*, April.

<sup>4</sup> *Zeits. f. Astrophysik*, 2, p. 153; 1931.

### University Representation.

"UNFORTUNATELY, the case of the universities has been weakened by their own action in selecting members according to their political complexion rather than for their intellectual stature." (News and Views, NATURE, May 30.)

The abolition of plural voting will inevitably result in a decrease (which may be considerable) in the number of votes cast in university constituencies. The *Times* has represented the expected neglect of the university vote as virtual extinction. Voting will tend to be left to those whose interest in the representation of 'stature' is strongest, and the ordinary politically-minded voter with a degree may easily be in the minority.

Is there no organisation adapted to turning this situation to advantage? The special opportunity seems to be this: The assumed majority will be compact, relatively small, and accessible. Its members, with special national needs in mind, should be prepared to excuse their representatives from attendance on those occasions when Parliament is pursuing what many of us regard as the merely political game. The universities' representatives need not, therefore, find their work unduly heavy, although it might for some time be discouragingly light.

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