

2367 A. If, however, the pressure of the absorbing vapour is made very small, then the rotational fine structure of the previously diffuse bands will reappear.

All bands which are usually found to be diffuse in absorption are entirely missing in the emission spectrum because the excited molecule dissociates before the radiation is emitted. In a letter to NATURE, Asundi² has reported experiments on the emission spectrum of S₂ vapour in the presence of a large amount of a rare gas. In this case, most of the otherwise missing bands reappear, not diffuse but sharp, in the spectrum.

An interpretation of the experiments referred to above may be given as follows: sulphur is strongly inclined to polymerise to form complex molecules such as S₆ or S₈. If therefore an S₂ molecule is approached by another sulphur atom or molecule, the potential field surrounding the molecule is strongly affected, and this will lead to a deformation of the potential curves representing the nuclear vibration. The phenomenon of predissociation is theoretically interpreted by the intersection of two potential curves of the same molecule, one of these leading to repulsion of the nuclei. In the case of sulphur, the influence of collisions with sulphur leads to a deformation of the potential curves in such a way that the transition to the 'repulsion' curve is made more easy. This explains why so many bands of S₂, obtained from heated sulphur, are diffuse in absorption. In emission, the S₂ molecule will predissociate out of its excited state, perturbed as it is by its neighbours, unless it is screened from sulphur by a rare gas. In the latter case the bands will reappear and may be found sharp if the energy difference to the intersection point of the potential curves is sufficiently large.

It may be mentioned that the pressure effect on the predissociation spectrum of S₂ is closely related to the phenomenon of induced predissociation which has been found in the spectra of I₂, Br₂, N₂ and NO.

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¹ Kornfeld and Wegmann, *Z. Electrochem.*, **36**, 789 (1930).

² Asundi, NATURE, **127**, 93 (1931).

Cultivation of the Unfit

E. W. M. SAYS that the minimum size of family required to maintain a population constant is four children; but, happily for women, at least one eminent statistician (Dr. Louis I. Dublin) has indicated that an average of three children per fertile couple will be sufficient. Next he raises a bogey when he declares that "sterilisation is a mutilation to which few will consent"; because, in males, it is merely a ligaturing of two superficial ducts and may become the commonest contraceptive method. Next he says that the only remedy for the over-production of children by the least fit is "compulsory sterilisation as a *punishment* for parents who have to resort to public assistance in order to support their children", although this would be an injustice until the popular remedy of abortion were legalised.

My population idea is that, whatever the social system may be, the women in the poorest classes should, so far as possible, have less than three children per family and most of the others not less, and that

sterilisation and abortion should at least be available to any person with two children.

In one of the book reviews in NATURE of January 18 (p. 88) the suggestion is made that "there is no general law of population—certainly no Malthusian law". I submit that Malthus's doctrine, that an unrestricted birth rate in a long-settled country must cause food shortage, constitutes a law of population.

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It is impossible to let the article "Cultivation of the Unfit", signed by E. W. M. in NATURE of January 11, pass without comment. With remarkable inconsistency, the author felicitates Sir Arthur Keith's apologia for war as being "the result of increasing population and race pressure" and "the means by which Nature decides which race shall 'inherit the earth'"; yet admits in an adjacent paragraph that the spread of birth-control will bring to an end the "cultivation of the unfit". If birth-control can be made to do this, why can it not also be made to bring to an end the existence of War, with all its horrors? Population-control by a world authority is the obvious goal towards which all our efforts should be tending.

E. W. M. then describes the weeding out of the (physically) unfit in animal communities, and goes on to refer to the "elaborate and costly social services" which keep alive the "morally, mentally, and physically" human unfit. This apparently guileless transition seems to involve several non sequiturs. Thus we are given no evidence that the deformed specimens of chamois or red deer were also morally and mentally unfit, or if so, unfit for what? The application of purely biological concepts to sociological phenomena is surely inadmissible.

Finally, the compulsory and *punitive* sterilisation of parents who "have to resort to public assistance in order to support their children" is offered as a remedy. Are we to assume that E. W. M. includes shipowners, beet-sugar shareholders, and other persons receiving financial benefit other than wages from industries subsidised by the State, though privately owned, in this category? And can he even be serious in suggesting biological "punishment" for the two million unemployed?

It is difficult to express the dismay experienced in seeing these doctrines, so dangerous for humanity, receiving the imprimatur of what is perhaps the most famous scientific weekly in the world.

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MY article on "The Cultivation of the Unfit", published in NATURE of January 11, has drawn several criticisms including those from Dr. B. Dunlop and Dr. Needham printed above. Dr. Dunlop criticises me because I have estimated the number of children necessary to maintain the population constant as four instead of three. All I can say is that I derived my information from Major Leonard Darwin, who had looked thoroughly into the matter. It may be that subsequent research has proved Major Darwin to be mistaken, but in such matters a policy of caution is essential. It is rash to base a sweeping statement on the results of one worker—it is better to wait and see.