

CORRESPONDENCE

Fungus Research

SIR,—It is becoming increasingly obvious that diseases of fungal origin are of major importance. The use of cytotoxic and immuno-suppressive drugs, corticosteroids and broad spectrum antibiotics is leading to an increasing number of local and generalized mycotic infections. The need for control of non-bacterial infections in extensive—for example, open heart—surgery is a major problem. Even dermatophyte infections are responsible for serious morbidity and wastage of man-hours. In industry, for instance, there were more than 5,000 spells of incapacity attributable to dermatophytosis from June 1967 to June 1968. The average length of absence from work was 13 days and a total of more than 111,000 man-days was lost (Department of Health and Social Security, 1969). In the veterinary field, mycotic abortion and *Dermatophilus* infection are also of considerable economic importance.

In order to gain some information concerning the amount of work being done in the United Kingdom in the field of medical and veterinary mycopathology, the Medical Mycology Subcommittee (disbanded 1969) of the Medical Research Council sent a questionnaire and a letter explaining the aims to a number of centres and individuals. The distribution list was compiled on the basis of persons known to be associated with the subject, either because of their membership of the British Society for Mycopathology or because of their personal contact with members of the Medical Mycology Committee. In fact, almost all of the medical teaching centres in the country and the majority of veterinary teaching establishments were included. The results of this were communicated to the MRC which has since given mycology a high priority. The main points elucidated are set out as follows.

Of 87 replies received out of 92 questionnaires sent out, 10 were from departments or sections employing at least one trained mycologist. All were engaged in research, a diagnostic service was provided by 8 and teaching was carried out in 6.

Replies from 34 medical centres (dermatological, bacteriological and pathologic departments) indicated that although teaching was carried out in the majority this was mainly clinical and in dermatology departments. Of the 34 replies from veterinary establishments (largely ARC sponsored units) 33 offered a diagnostic service but only 8 and 7 centres also contributed to teaching and research respectively. It was clear that medical mycology was taught piece-

meal to medical and veterinary students (one or two lectures) and hardly ever to science students.

The survey also emphasized that there is a remarkably small number of persons employed in medical and veterinary mycology. This was confirmed by reference to membership list of the British Society for Mycopathology. Of the 83 British members only 31 had received formal training in mycology and of these 9 were young individuals still under training.

One of the elements involved in this unsatisfactory situation is the lack of a firm career structure for medical mycologists. Implementation of the Zuckermann report in the NHS might alleviate this but nevertheless the training of more medical mycologists is essential.

A place should be found in undergraduate curricula in science and medicine for more extensive teaching in medical mycology, and the institution of an MSc course would also be of the utmost value. In this way, a supply of adequately trained workers for university and hospital departments would become available and thus provide a better mycological service throughout. Fundamental research would also be stimulated and would have an influence beyond mycology itself. The fungi provide excellent systems for the study of the general problems of host-parasite relations and there is no lack of subjects which urgently require direct investigation.

Yours faithfully,

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Transferrin

SIR,—In a recent *Nature* article¹, Chernelch and Brown concluded that their *in vivo* experiments designed to test the Fletcher-Huehns hypothesis of functional differences of iron atoms bound to transferrin² failed to support the predictions of this theory. These authors apparently have overlooked or misinterpreted two earlier publications which indicate that an exchange of iron atoms occurs among molecules of transferrin and apotransferrin. Morgan *et al.*³ have shown that *in vivo* experiments in

humans "provided evidence for the return to the plasma of appreciable amounts of radioiron attached to a second transferrin". Aisen and Leibman⁴ demonstrated that at physiological concentration of citrate and at pH 7.4, there was complete and rapid exchange of iron atoms between transferrins and apotransferrins. In light of this evidence it is difficult to understand how Chernelch and Brown could be able to follow the course of transferrins selectively labelled predominantly on sites A or B of transferrin molecules in an *in vivo* study wherein exchange would occur. The failure of their experiments to behave in the predicted manner does not invalidate the Fletcher-Huehns theory as they have suggested.

As a criterion for their hypothesis, Fletcher and Huehns postulated that there be no redistribution of iron from one binding site to another. This is not a mandatory dictate for their theory. If iron exchange among transferrin molecules is mediated by a low molecular weight chelating agent such as citrate, possibly by the formation of a ternary complex⁵ or if the exchange is due to feedback from a second reflux compartment of the iron pool³, then even in the event of complete equilibrium of iron transferrin binding site exchange, there still will be equal numbers of molecules with iron bound to either site and metabolism would be regulated by the number of receptors and their rates of reactivity.

Yours faithfully,

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¹ Chernelch, M., and Brown, E. B., *Nature*, **226**, 356 (1970).

² Fletcher, J., and Huehns, E. R., *Nature*, **218**, 1211 (1968).

³ Morgan, E. H., Marsaglia, G., Giblett, E. R., and Finch, C. A., *J. Lab. Clin. Med.*, **69**, 370 (1967).

⁴ Aisen, P., and Leibman, A., *Biochem. Biophys. Res. Commun.*, **32**, 220 (1968).

⁵ Bates, G. W., Billups, C., and Saltman, P., *J. Biol. Chem.*, **242**, 2810 (1967).

Meat Factories

SIR,—For several reasons, the practice of killing animals for their meat may well become more and more impractical in the future. There is a moral standpoint, for instance, from which one perhaps ought not to eat meat if one is not at least prepared to kill the animal personally; however, vegetarianism seems a dubious (not to say unsatisfactory)