

ml.; but an unexpected abnormal E.E.G. was obtained showing fast activity typical of barbiturate intoxication (see figure). Three days later, the E.E.G. had reverted to normal. The patient's subsequent progress was satisfactory. The results of liver-function tests and a blood-count were normal.

The changes in the E.E.G. are similar to those in barbiturate intoxication; but a rapid recovery from drowsiness is never seen with barbiturates. As far as we know, E.E.G. abnormalities associated with chlorodiazepoxide intoxication have so far been described only in the United States by Randall.<sup>2</sup>

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**MODERN DEVELOPMENTS IN LIVER SURGERY**

SIR,—I have read with great interest the Occasional Survey by Mr. Brearley.<sup>3</sup> The only thing I regret is that he did not mention the important contribution to the subject made by the staff of the Municipal Hospital at Arnhem, the Netherlands.<sup>4-6</sup>

Experimental work on the regenerative power of the liver has led these clinicians to design an operative procedure ("Schalm's operation": ligation of one of the hepatic bile-ducts) which might be of value in treating liver cirrhosis. A limited number of patients have already been operated upon. Dr. Bax and Dr. Schalm have travelled to South Africa in order to discuss the possibilities of this treatment in the Bantu among whom cirrhosis of the liver is notoriously common.

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**MUSHROOM POISONING**

SIR,—The article on mushroom poisoning by Dr. Elliott and others (Sept. 16) ended with a recommendation that made me a little sad. This was to avoid fungi growing near trees or those with a volva. If one follows this rule one will miss two of the best edible fungi: *Amanita rubescens* (the Blusher) and *Russula cyanoxantha*.

*A. rubescens* may be distinguished from its lethal cousin by the fact that the cut surface of the cap and stem turns a brownish red on exposure to the air. *R. cyanoxantha* cannot be confused with *R. emetica*, which has a bright red cap, but needs to be distinguished from certain inedible species of the genus *Lactaria*. The latter give off a white milky fluid, when broken, which tastes peppery.

Most of the other really good edible fungi grow in the open. I particularly recommend *Lepiota rachodes* (a near relative of *L. procera*, the parasol mushroom, also edible), *Clitocybe nebularis*, *Tricholoma nudum* and its relative *T. personatum*, both Blewits, and *Lactaria deliciosa*, which is yellow and rather like a Chantarelle. Members of the *Boletus* genus, with their tubular gills, are much recommended, but with the exception of *B. edulis* their flavour leaves much to be desired. Besides one has to avoid *B. satanus*, the flesh of which turns blue on exposure to the air. So it does with some other species, but it is a useful guide, and the change does not occur in the good ones.

Perhaps I should add that before eating an unfamiliar fungus I always get it identified by a competent mycologist.

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SIR,—The excellent article on mushroom poisoning contains what I take to be a few errors.

The diagram of the fungus concerned is misleading because

2. Randall, L. O. *Dis. nerv. Syst.* 1959, 21, suppl. 3, p. 7.  
3. Brearley, R. *Lancet*, 1961, i, 935.  
4. Schalm, L., Schulte, M. J., Miete, M., Bax, H. R., Mansens, B. J., Rodrigues Pereira, A. *ibid.* 1952, i, 75.  
5. Schalm, L., Bax, H. R., Mansens, B. J. *Gastroenterology*, 1956, 31, 131.  
6. Bax, H. R. *Arch. chir. neerl.* 1956, 8, 331.

although *Amanita phalloides* may retain part of the volva adherent to the cap, it does not do so characteristically, and indeed the drawing is more suggestive of *A. mappa*. Surely volva and ring are found also in the genus *Annelaria*. Although, very possibly, healthy people do not often succumb to other forms of poisoning by fungi, apparently well-authenticated deaths have occurred from *Entoloma lividum* and *Inocybe patouillardi*, and if eaten raw *Helvella (Gyromitra) esculenta* has proved fatal. Although Neuhann's remarks about the significance of psychological symptoms are worth quoting, death does not invariably follow their appearance.

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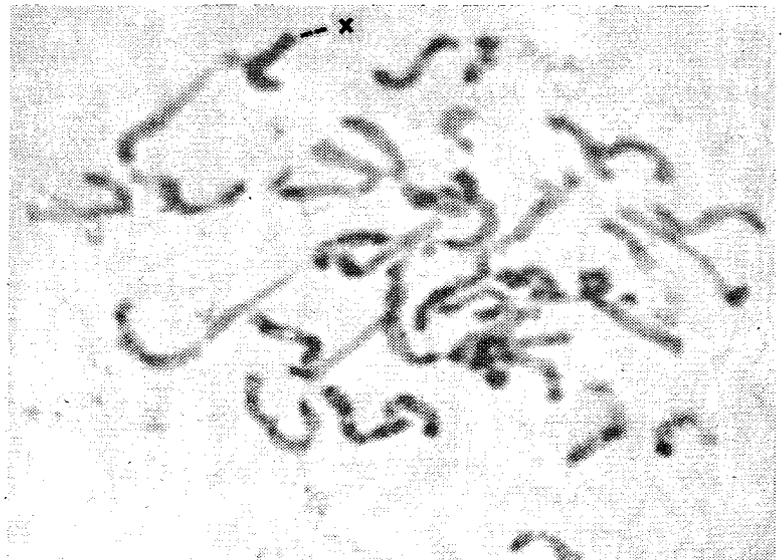
**PROPERTIES OF X CHROMOSOMES**

SIR,—The attractive hypothesis formulated by Lyon<sup>1</sup> to explain the ambiguous behaviour of X-linked recessive genes in heterozygous female mice was introduced in this journal by Polani and Hamerton<sup>2</sup> who were considering the phenotypic expression in man of the X-linked recessive gene responsible for colour-blindness. Lyon contends that an individual X chromosome which remains heavily condensed during somatic interphase is restrained from exerting any genic influence. Since in mammals one of the two Xs in the female somatic cell always forms the sex-chromatin body,<sup>3</sup> only one X chromosome in both female and male cells is actually functioning.

In *Drosophila melanogaster*, the X chromosome is composed of two distinct areas. The euchromatic region containing most of the genetic factors invariably remains in an extended state, while the heterochromatic region condenses to form a chromosome at somatic interphase in both sexes.<sup>4</sup> In man and other mammals, quite another situation exists. The X chromosome is not made of two regions; rather, each X chromosome behaves differently from its homologue. Thus, an entire X, when heteropyknotic, forms the sex-chromatin body (see figure); when isopyknotic, the X is indistinguishable from the euchromatic autosomes.<sup>5</sup> Because of this remarkable disparity in the properties of the X chromosome, analogies between *drosophila* and man, at least so far as X-linked traits are concerned, may be hard to find. Lyon's hypothesis has taken into account this ambivalent behaviour of mammalian X chromosomes and provided us with a new insight into several situations in man.

The normal male is naturally monosomic for the X, and the

1. Lyon, M. F. *Nature, Lond.* 1961, 190, 372.  
2. Polani, P. E., Hamerton, J. L. *Lancet*, July 29, 1961, p. 262.  
3. Ohno, S., Makino, S. *ibid.* 1961, i, 78.  
4. Kaufmann, B. F. J. *Morphol.* 1934, 56, 125.  
5. Ohno, S., Weiler, C. *Chromosoma (Berl.)* 1961, 12, 362.



A somatic cell in mid-prophase from a 4-month-old female foetus containing one chromosome precociously condensed along its entire length, presumed to be an X.