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## LEADING ARTICLES



## PAPERS AND ORIGINALS



## MEDICAL PRACTICE



### NEWS AND NOTES



### SUPPLEMENT



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# CORRESPONDENCE



*We may return unduly long letters to the author for shortening so that we can offer readers as wide a selection as possible. We receive so many letters each week that we have to omit some of them. Letters must be signed personally by all their authors. We cannot acknowledge their receipt unless a stamped addressed envelope or an international reply coupon is enclosed.*

## Oral temperature and hypothermia

SIR,—Dr James Carne (10 March, p 690) should not be surprised that in a majority of his elderly patients attending surgery during the recent cold winter weather oral temperatures were 35°C or below. He was not observing hypothermia in these patients but the effect of a cold external environment on the temperature of the tissues inside the mouth. Oral temperature readings are recognised to be notoriously misleading when taken in either low or high ambient temperature conditions.

In a recent series of investigations on 16 young adults aged 20-40 years and 16 elderly people 70-85 years of age sitting comfortably (wearing normal indoor winter clothing) in a temperature-controlled room, five-minute oral temperature readings measured by a thermistor decreased progressively, in both groups, approaching 35°C in the elderly at the end of two hours in 12°C ambient air conditions. Similarly, lagged (but not servo-controlled) ear temperatures measured by thermistor in the external auditory canal decreased significantly at 12°C, but there was no significant change in urine temperature taken at the beginning and end of the experiment.

The diagnosis of hypothermia must be based on measurement of the deep body temperature. This can be carried out by recording urine temperature, as has been shown in domiciliary studies in the elderly.[1]

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[1] Fox, R H, *et al*, *British Medical Journal*, 1973, **1**, 200.

## Is hyperthermia a teratogen?

SIR,—We wish to make several comments regarding the recent article (9 December, p 1586) entitled "Is hyperthermia a teratogen?" There are different causes of raised body temperature, and physiological responses evoked by fever are quite different from responses to hyperthermia (such as that induced in a sauna bath). Most investigators in thermoregulation consider that fever results when deep body temperature matches a raised thermoregulatory "set point," induced by pyrogen. In hyperthermia, the set point is lower than body temperature.[1] The significance of the physiological differences between fever and hyperthermia has recently been discussed elsewhere.[2]

The article in question did not differentiate between fever and environmental hyperthermia, nor did it consider the possibility that raised body temperature in these two different physiological states might produce different pregnancy-related problems (ranging from abortion to learning disabilities).

The article also left an impression that lesions either develop exclusively as a consequence of "hyperthermia" or are exclusively due to some other cause. We suggest, and have reported elsewhere,[3] that fever may exacerbate developmental problems caused by another agent. These effects might then be expressed by increased severity of a syndrome characteristic of the primary teratogenic agent. Preliminary data from our laboratory indicate that in rabbits exposure to rubella vaccine and prostaglandin-induced fever produces fewer young, reduced body weight, and heart and dental defects. Controls had normal litter-size and weight and no defects.

For the following reasons it seems that comparing the incidence of microphthalmia or anencephaly, or both, in young born in Finland (where saunas are taken frequently) with the incidence of these defects in other countries cannot be used to either support or deny the proposition that hyperthermia is a teratogen. Firstly, the short period of maternal hyperthermia developed in a sauna may not be severe enough to cause easily detected birth defects in healthy humans. The 1·6-2°C increase in rectal temperature for less than two hours due to sauna exposure[4] is near the minimum reported to cause defects in animals.[3 5 6] Secondly, a high frequency of sauna bathing might, conversely, prevent implantation or cause early miscarriage, thereby drastically reducing the number of malformed fetuses brought to term. Thirdly, recording the incidence of manifestation of a syndrome attributed to febrile illness and then expecting to find a high incidence of that syndrome in a population of predominantly healthy individuals having relatively short exposures (as compared with defect-related fever of two days-one week[6]) to environmental hyperthermia does not seem valid.

We feel that although definitive evidence for the teratogenicity of fever or hyperthermia, or