This investigation has shown that highly significant seasonal variations in bone mineral content occur, with increments from winter to summer and decrements from summer to winter; little change being seen from spring to autumn or vice versa. The increments could be explained by an increase in vitamin D activity from increased exposure to sunlight in the spring and summer. This would infer the presence of asymptomatic vitamin D deficiency. The total surface area of osteoid in the bones increases with age in women after the fourth decade of life[5], suggesting defective mineralization of osteoid as is seen in vitamin D deficiency states. Serum vitamin D activities in post-menopausal (Michigan) women are higher in the summer than the winter[6]. Also serum phosphorus[7] and calcium concentrations rise from winter to summer, and this is consistent with a humoral response to vitamin D. Whether or not such humoral changes could explain our findings must await further investigation, but the possibility that sub-clinical vitamin D deficiency might be a contributory factor in post-menopausal osteoporosis is of considerable interest.

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Tissue Zinc in Malignant Disease

It was reported by two of us that liver-zinc concentration is significantly higher in subjects dying from malignant disease than in non-malignant control series[1]. The increase was confined to parts of the liver which showed no macro or microscopic evidence of carcinomatous invasion. (The zinc content of the malignant deposits themselves is lower than that of normal liver.) Three explanations were considered. First, it was possible that the rise in liver zinc reflected a widespread premalignant change not peculiar to the liver. Second, it could be related to the poor nutritional state of most patients dying from malignant disease. Third, it could be a feature of the chemical defence reaction of normal liver tissue to invasion by malignant cells. These possibilities were further explored by measuring the zinc concentration in the liver, kidneys, heart muscle, spleen and pancreas of a further series of subjects. The analytical methods were as reported previously[1,2]. The results (Table 1) confirm the increase in liver zinc in apparently normal tissue in subjects dying from carcinoma but show no comparable increase in the zinc concentration of the kidney, heart, spleen and pancreas. The scatter of results in lung tissue was too wide to allow a firm negative conclusion.

Table 1 Tissue Zinc Levels in Subjects with and without Malignant Disease

Tissue	Malignant disease Mean	s.d.	Control series Mean	s.d.	*P*
Liver	837	204	538	95	<0.05
Kidney	502	154	505	106	>0.49
Heart	301	98	364	69	>0.25
Spleen	169	64	196	42	>0.25
Pancreas	263	104	291	126	>0.30

Zinc values in mg per 100 g ashed tissue.

The findings make it unlikely that the accumulation of zinc in the apparently healthy liver of carcinomatous subjects is a reflexion of a widespread premalignant change; and it is similarly improbable that the liver alone would be affected by the patients' poor nutritional state. We therefore conclude that liver zinc concentration rises probably as part of the normal tissue's biochemical defence reaction to invasion by malignant cells. Such an invasion in the course of a fatal malignant disease is probably invariable, the vast majority of invading cells being eliminated by the host tissue. Zinc also accumulates in granulation tissue and in and around healing wounds[3,4]; and it is conceivable that the two reactions have biochemical features in common.

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Cannabis Induced Impairment of Performance of a Divided Attention Task

An important factor in driving skill is the information processing ability of the driver. The human operator can process less information within a certain time if it must be received from more than one source[1]. Driving is such a situation and can be described as a divided attention task in which the driver is forced to perform a compensatory tracking task while searching for and recognizing environmental signals[2]. Our subjects were required to monitor and respond to two types of visual signals from different sources. We compared the effect of cannabis on the performance of subjects with and without previous experience of cannabis.

Ten male volunteer subjects had not used marihuana before the experiment and ten were experienced social users. Median use was once a week for three years but this varied within the group. The two groups were matched for age and education.