Table 1. Free-Radical Content of Rat Liver and Hepatoma obtained from Electron Spin Resonance Measurements carried out at −130° C.

Sample type	No. of samples	Free-radical content in molecules × 10^{9}/gm. wet weight*
Freeze-dried rat liver	2	10
Immediately frozen rat liver	3	1·9
Rat liver stored at 0–25° C. from 22 hr. to 2 weeks	3	1·3
Immediately frozen rat hepatoma	3	0·67

* Values given are based on an estimate of the electron spin resonance spectrometer sensitivity obtained using a 6×10^{-4} gm. diphenylpicrylhydrazil sample for calibration.

resonance signal from lyophilized tissue arises from sorbed molecular oxygen.

Although storage of the unaltered samples at 0–25° C. causes a reduction in electron spin resonance signal strength compared with that observed for instantly frozen samples (Table 1), no significant difference in signal amplitude was found for storage periods ranging from twenty-two hours to two weeks. Therefore, the conclusion is that some of the free radicals initially present in the instantly frozen samples are unstable at room temperature; the remainder appear to be extremely stable.

Quite possibly part of the observed electron spin resonance signal (particularly that part which is stable at room temperature) observed in frozen liver tissue is caused by the presence of certain paramagnetic trace elements. From the careful investigations of Heggen and Strock[3] it is concluded that for those paramagnetic ions exhibiting a g value close to 2·00, only one or two trace elements occur in large enough concentrations to contribute to the signal. However, more work is being carried out at the present time to determine to what extent such ions are affecting the signal intensities.

Investigations of hepatoma tissue were carried out using Novikoff tumour transplant material originally induced by use of diacetylaminofluorene. As seen from Table 1, the free-radical content of instantly frozen rat hepatoma is only roughly one-third of that found in similarly processed normal liver.

Thus, the number of unpaired electrons observed in frozen samples is much lower than that obtained for freeze-dried specimens. The differences in signal strength between instantly frozen rat liver and rat hepatoma is much greater than that reported by Commoner[1], who used the freeze drying process.

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Detection of Polarization by Biological Organisms

For the construction of colour filters Christiansen[1] had the idea of using scattering to attenuate unwanted wave-lengths. He used a finely divided isotropic scatterer in an isotropic medium to achieve partial monochromatization. One of us (A. N. F.), in connexion with a Science Fair project on these filters, suggested the use as a scatterer of a bundle of parallel transparent birefringent fibres immersed in an isotropic medium the refractive index of which matched one of the refractive indices of the fibres. Light vibrating in a direction characterized by this index will then be transmitted unattenuated by scattering. A Patent Office search reveals a number of patents involving scattering to attenuate unwanted components[2]. However, there seems to be no recognition of this method of achieving polarized light in the scientific literature. These patents seem to have been largely overlooked.

There are a large number of papers devoted to the responses to polarized light of various biological organisms[3]. In most cases, the method used to determine the plane of polarization is not known.

We wish to suggest that the above-mentioned polarizing mechanism may well play the necessary part in such determination. Animal tissues often contain bundles of parallel transparent birefringent fibres immersed in a liquid or gel medium. If the index of refraction of the medium is other than the average of the two refractive indices of the fibres, then any transmitted light will be partially polarized. If it matches one of the refractive indices, then that component will be a maximum in intensity. We intend to search for such polarizers.

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Stable Test-Papers for Seminal Acid Phosphatase

The acid phosphatase test has proved its usefulness in seminal stain examinations and is now in widespread use[1–4]. The desirability of preparing a stable form of the reagent was obvious, more especially for 'scene-of-crime' searching, post-mortem examinations and for scientists and clinicians without laboratory facilities.

We have prepared stable test papers as follows.

200 mgm. α-naphthyl phosphoric acid and 400 mgm. diazo-*o*-dianisidine (as 'Brentamine Fast Blue *B* Salt', Imperial Chemical Industries) are dissolved in 100 ml. *M*/5 citric acid/sodium citrate buffer of *p*H 4·9. Filter papers soaked in this solution are immediately blotted and left to dry singly at room temperature. These manipulations are best carried out in light of low intensity. The papers are