to intervene immediately in crisis situations, and worked out a shorter and more practical technique of interviewing than social workers are traditionally taught. I suspect that many more social workers would do the same if given the chance. At present most of them can only be contacted during office hours and then only if the clerk in the social services department office chooses to tell them that you phoned. The ideal would be local-authority attachment to particular practices, but the next best thing would be reimbursement of the social worker's salary. —I am, etc.,

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Localization of Hepatitis B Antigen in Liver Organ Cultures

SIR,—Hepatitis B antigen has been produced in organ cultures of human embryo liver inoculated with a limited number of known infective sera.[1] One serum, referred to as G.C., was obtained from a young healthy volunteer blood donor whose blood recently caused two deaths from hepatitis in transfused recipients. Examination by electron microscopy of ultrathin sections of a liver organ culture inoculated with 0·1 ml of this serum revealed the presence of spherical particles measuring 20-22 nm in diameter in both the cytoplasm and nucleus of hepatocytes (see figure). The particles were detected four and seven days after inoculation of the organ culture. These particles were present in many of the cells, principally at the rim of the culture. Such particles were not found in control organ culture preparations inoculated with normal human serum.

These particles are very similar to the hepatitis B antigen particles described in antigen-positive liver biopsy material by a number of other investigators.[2-5] Nowoslawski *et al.*[6] demonstrated by immunofluorescence the presence of hepatitis B antigen in the cytoplasm as well as the nucleus of hepatocytes of six patients with lymphoproliferative disorders; but by electron microscopy only intranuclear particles were found. These particles were identical to those we describe now. Specific fluorescence was demonstrated in many of the hepatocytes by the direct immunofluorescent antibody technique[7] in 5-7 μm sections of the same liver organ culture preparation inoculated with serum G.C. No fluorescence was detected in the control organ cultures.—We are, etc.,

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Severely Malformed Children

SIR,—In the tape-recorded discussion on malformed children (5 May, p. 284) Mr. H. B. Eckstein draws attention to a strange anomaly—namely, that untreated babies in first-class centres of baby care have all died "within a month," "within eight months," or similar figures, and yet surgeons are seeing a number of untreated cases for salvage from other hospitals.

The "100% success" rate for the no-treatment policy contrasts with my own personal experience 25 years ago, when no patients received primary surgery and most of them received ordinary home care. The survival of quite a number of the latter makes one wonder whether the ordinary standards of baby care are worse than 25 years ago—or is there some other factor in their management?

Another impression which comes over in the recording—perhaps wrongly—is the apparent lack of concern for the maximum fulfilment and the happiness of these severely affected children during their life span, however long or short that may be. One is particularly concerned that the psychiatrist in the discussion does not even hint at the feelings of contentment and security which at this age are important aspects of happiness for the child and which come from knowing and being loved by one person (usually the mother).

A severely disabled child needs this personal affection and attachment, perhaps even more than an able-bodied one and if this poses a heavy burden in the mother and the family, I should have thought that the psychiatrist would be the very one to propose support for the family rather than elimination of the child from the family environment.—I am, etc.,

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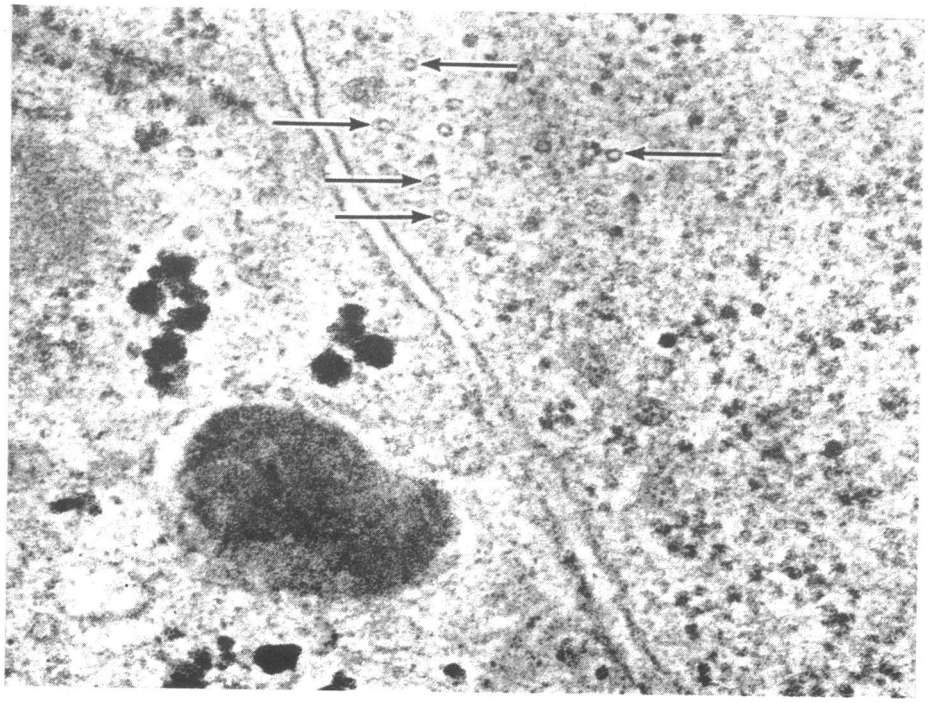

Virus-like particles of hepatitis B antigen in the cytoplasm of a hepatocyte from an inoculated human embryo liver organ culture at day 7 × 100,000.

Multiple Factors in Leukaemogenesis

SIR,—In their study of children with leukaemia Bross and Natarajan[1] investigated the association between irradiation in utero and some "indicators of susceptibility" (viral infection, bacterial infection, and allergy) shown by the leukaemic child from birth up to a time six months before diagnosis. They and you, in a leading article (21 October, 1972, p. 128), interpreted their results as showing that "the apparently harmful effects of antenatal irradiation are greatly increased in certain susceptible subgroups of children possessing the indicators associated with a slightly higher intrinsic risk of leukaemia." However, these findings may be interpreted as showing that children with leukaemia are simply more prone to viral and bacterial infections and allergies before clinical onset of the disease (or are more likely to report such conditions in a retrospective study) and that irradiation is a red herring in this argument. If this is correct, the relative risk of irradiation (that is, the ratio of the risk of a child irradiated in utero developing leukaemia to the risk of a child not so irradiated developing leukaemia) would be the same in children reporting such conditions as those not so doing.

Bross and Natarajan kindly supplied us with the data on their leukaemic patients and controls tabulated by age at diagnosis, intrauterine radiation history, and susceptibility indicators of infections or allergies (tables I and II). Table III shows the relative risks of irradiation in each age group for those reporting viral or bacterial infections or allergies (R_1) and those not reporting such diseases (R_2). For example, in the first row of table III the relative risk of irradiation in children 1-4 years old reporting viral infections is obtained from tables I and II by a comparison of cases and controls reporting virus infections—$R_1 = (15 \times 43)/(32 \times 12) = 1{\cdot}68$. Similiarly the relative risk of irradiation

TABLE I—*Leukaemia Patients*

Ages (Years)	Infections or Allergies							
	None		Viral		Bacterial		Allergies	
	I−	I+	I−	I+	I−	I+	I−	I+
1–4 ..	47	33	32	15	16	12	10	4
5–9 ..	14	4	23	8	10	3	8	4
10–14 ..	8	1	20	2	10	3	5	3
Total ..	69	38	75	25	36	18	23	11

I+ indicates irradiated in utero.
I− indicates not irradiated in utero.

TABLE II—*Controls*

Ages (Years)	Infections or Allergies							
	None		Viral		Bacterial		Allergies	
	I−	I+	I−	I+	I−	I+	I−	I+
1–4 ..	108	50	43	12	14	3	6	0
5–9 ..	78	18	108	35	25	10	10	4
10–14 ..	57	9	136	20	45	5	15	2
Total ..	243	77	287	67	84	18	31	6

I+ indicates irradiated in utero.
I− indicates not irradiated in utero.

in those not reporting viral diseases (or bacterial diseases or allergies) is given by $R_2 = (33 \times 108)/(47 \times 50) = 1{\cdot}52$. Our hypothesis states that these two relative risks should, except for random variation, be equal, that is $R_1/R_2 = 1$. The observed value of the ratio is 1·11 and we have calculated the one-sided exact probability (assuming all margins fixed in the $2 \times 2 \times 2$ table[2]) of observing by chance a ratio as great or greater than this if the true ratio is unity. In no age group and in no infection or allergy grouping does the calculated probability level approach conventional levels of statistical significance. Again, when the findings in the three age groupings are combined, using a modification for $2 \times 2 \times 2$ tables of the Mantel and Haenszel[3] method, none of the resulting χ^2 values approaches statistical significance.

Of course, a statistical non-significant difference does not mean that a difference is not present. There are insufficient data available to reject a ratio of relative risks considerably in excess of unity (see, for example, the allergy group in table III). However, we would conclude that the data are certainly compatible with the hypothesis that children with leukaemia are simply more prone to infections and allergies before clinical onset of the disease—these characterize the disease itself and do not relate to the child's inherent susceptibility to leukaemia.

Hollocher[4] reached a similar conclusion, using the data given in Bross and Natarajan's paper, that none of the groups were specially susceptible to radiation.

There are considerable problems associated with using post hoc markers as "indicators of susceptibility." The method of analysis we have used would be inappropriate if the "indicators" could not be considered as merely a possible result of the disease process. It should be noted, for example, that the finding of similar relative risks in those reporting infections and allergies and in those not reporting these conditions does not exclude the possibility that the conditions are indicators of a group particularly susceptible to radiation. So that if virus diseases are an indicator of a susceptible group to leukaemia induction by agents other than intrauterine irradiation the the *relative* risk of irradiation will be *less* in this group unless their susceptibility to radiation is also increased. (Rothman and Keller[5] have discussed this problem in relation to the joint effects of alcohol and tobacco on the risk of cancer of the mouth and pharynx.) Had we found the relative risks to be markedly different, then an alternative hypothesis to that of Bross and Natarajan would be that children with radiation leukaemia simply differ in their susceptibility to infections and allergies compared with children who develop leukaemia but who were not irradiated (that is, radiation leukaemia is a different disease).

If one wishes to specify susceptible subgroups, a way must be found of identifying susceptible parents or fetuses before the intrauterine radiation is administered.

We are grateful to Professor B. MacMahon and Dr. K. Rothman for helpful discussions on this problem.

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Redesign of Medical Records in General Practice

SIR,—Many doctors must have read the Department of Health's circular (ECN 946, April 1973) on the above subject with surprise and shock. We learn that the Department has adopted a recommendation that A4 international paper size requiring folders measuring $12\frac{1}{4}$ in $\times 9\frac{1}{2}$ in (310 mm $\times$ 240 mm) should be adopted for general practice record sheets. It is admitted that the storage space required for these documents would be at least twice that needed for the present ECs 5 and 6. Suggestions are made for "small mobile steps" and other devices for use by one's staff in filing these large records. It is to be officially recommended that extra space for secretarial work will now be required in practice premises, including health centres. The total cost of providing the new folders and medical records and in effecting the changeover, the new filing systems needed to accommodate them, and the alterations to buildings needed to accommodate the systems must run into tens of millions of pounds. Surely no Government should allow such expenditure.

I hope that the hitherto silent majority of family doctors who are quite content with the present conveniently small and portable record folders will unite in protest against this expensive new scheme. Imagine the inconvenience of having 30 or 40 of these large folders out on one's desk for a surgery, of having piles of them all over the office being got out for the next surgery, waiting to be filed, or for various administrative purposes. Imagine the large parcels to be posted to and from the executive council (or its successor) each week. Imagine having to carry 20 or 30 folders in one's car for patients being visited at home.

If those who are dissatisfied with the present medical record envelopes would take the trouble to "prune" unnecessary cards and correspondence and to staple everything in date order, I think they would find them reasonably satisfactory.—I am, etc.,

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SIR,—I have received and read with dismay the ECN 946 on the subject of the redesign of medical records in general practice. It would appear that wise persons have decided to adopt (and have no doubt already printed) a new A4 size of record folder.

The circular states that "floor space needed per 1,000 records . . . will be at least twice that needed for the present ECs 5 and 6." Leaving aside the question of whether or not the EC 5, which has lasted for 50 years, is not an excellent and adequate vehicle for general practice medical records, I think that most doctors in the country have probably not had cause or time to consider the very great alteration which will be necessary to accommodate the new medical record folders.

The dimensions of the present medical record card are 5 in $\times$ 7 in and have therefore an area of 35 in^2. The proposed new folder measures $12\frac{1}{4}$ in $\times$ $9\frac{1}{2}$ in, with an area of more than 110 in^2. Bearing in mind that the folder will be probably twice as thick as a present medical record folder, simple arithmetic shows that the volume, never mind the area, of a new medical record will be six to eight times the volume of the old one. I am sure that my situation is not unique, in that it is impossible to put seven times the volume of filing cabinets that we

TABLE III—*Relative Risks of Irradiation*

Ages (Years)	Viral Infections					Bacterial Infections					Allergies					Infections or Allergies				
	R_1	R_2	R_1/R_2	E.P.*	χ_1^2†	R_1	R_2	R_1/R_2	E.P.	χ_1^2	R_1	R_2	R_1/R_2	E.P.	χ_1^2	R_1	R_2	R_1/R_2	E.P.	χ_1^2
1–4	1·68	1·52	1·11	0·53		3·50	1·52	2·30	0·25		∞	1·52	∞	0·34		2·24	1·52	1·47	0·27	
5–9	1·07	1·24	0·86	0·72		0·75	1·24	0·60	0·85		1·25	1·24	1·01	0·72		1·07	1·24	0·86	0·73	
10–14	0·68	0·79	0·86	0·80		2·70	0·79	3·42	0·41		4·50	0·79	5·70	0·35		1·66	0·79	2·10	0·48	
					0·00					0·67					1·25					0·59

*E.P. = exact probability (one-sided).
†In each age group the expected number of irradiated leukaemia cases with infections or allergy was calculated on the hypothesis that $R_1 = R_2$. The variance was also calculated and χ^2 computed as ((Observed-Expected))$^2/\Sigma$ variance where the summation is over the three age groupings.