some of these characteristics.¹ However, the report by Prof. N. R. Butler and Mr. H. Goldstein (8 December 1973, p. 573) that children of smoking mothers have lower reading scores and lower I.Q.s than the children of non-smoking mothers prompts me to offer a third sort of explanation. It is that the life-style and environment of children of smoking mothers has the deleterious effect.

People who smoke seem to be more impetuous and more excitement-seeking,² to be more neurotic, and to change jobs and spouses more often than non-smokers.³⁻⁷ I quote Yerushalmy⁸: "When we investigated and compared our smokers and non-smokers, we found striking differences in mode of life characteristics between the two groups. Smokers were less likely to use contraceptive methods than non-smokers. They were less likely to plan the pregnancy. They were more likely to drink hard liquor, beer and coffee, while non-smokers were more likely to drink tea, milk and wine." Though Yerushalmy does not say so, almost all of these differences seem to be subsumed under the suggestion that smokers are more extraverted than non-smokers.

Now given this maternal impulsiveness and search for excitement, it seems likely that in the households of smokers less emphasis will be placed on academic achievement and in particular on reading. So in this context the low reading scores of children of smoking mothers is not surprising.

This sort of explanation would perhaps be less plausible in regard to the low I.Q. scores (as opposed to the low reading scores) of children of smokers. However, it seems that among smokers those who discontinue are more intelligent than average.⁹ It would seem to follow that I.Q. is associated negatively with smoking itself. For (unless life-long non-smokers are particularly unintelligent) if the mean I.Q. of smokers who quit is higher than average, then that of those who do not quit is less than average.

Hence it seems reasonable to wonder whether the smoking mothers (rather than the environment or the cigarettes) are the cause of their children's low I.Q. It would be interesting to know whether mothers who smoke are, in fact, less intelligent than those who do not.—I am, etc.,

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¹ James, W. H., *Nature*, 1973, **246**, 235.

² Jacobs, M. A., et al., *Journal of Nervous and Mental Disease*, 1965, **141**, 161.

³ Waters, W. E., *British Journal of Preventive and Social Medicine*, 1971, **25**, 162.

⁴ Lilienfeld, A. M., *Journal of the National Cancer Institute*, 1959, **22**, 259.

⁵ Eysenck, H. J., *British Medical Journal*, 1960, **1**, 1456.

⁶ Heath, C. W., *Archives of Internal Medicine*, 1958, **101**, 377.

⁷ Thomas, C. B., *Annals of Internal Medicine*, 1960, **53**, 697.

⁸ Yerushalmy, J., in *Proceedings of the Sixth Berkeley Symposium on Mathematical Statistics and Probability*, ed. L. M. Le Cam, J. Neyman, and E. L. Scott, p. 336. University of California Press, 1972.

⁹ *Sunday Times*, 28 April 1974, p. 32.

Smoking and Leucocyte Count

SIR,—In 1970 I reported the mean white cell count in heavy smokers to be strikingly higher than in non-smokers,¹ with a reversal in those who gave up smoking to

levels near those of men who had never smoked. These findings of high white cell counts in heavy smokers have been confirmed in France,² in the U.S.A.,³ and in pregnant women in England.⁴ However, it has been suggested to me that these findings might reflect constitutional or personality differences rather than a direct link with smoking habits.

The men in my study had also completed the Middlesex Hospital Questionnaire (M.H.Q.),⁵ a short self-rating scale of psychoneurotic symptoms and traits comprising six subtests. These subtests are called "free floating" anxiety (fear without an object), phobic anxiety (fear of specific objects or situations), obsessiveness (orderliness, meticulousness, conscientiousness), somatic anxiety (breathlessness, dizziness), depression (sad mood), and hysteria (fondness for display, shallow emotional feeling). Total score from all subtests has been shown⁶ to be a good discriminator.

The importance of social class in biological tests has earlier been pointed out;⁷ the results in the accompanying table relate only to manual workers in social classes 3 and 4 (skilled and semi-skilled) aged 40-54 years. The results show quite clearly that while there are clear and consistent differences in mean leucocyte counts between ex-smokers and heavy cigarette smokers within each personality range, no such consistency arises between personality ranges within individual smoking habits. Lest the choice of these arbitrary personality ranges should hide a more positive relationship than appears likely from the table, correlation tests were carried out between individual leucocyte counts and personality scores. There was no significant correlation between personality score and leucocyte count, nor was there any significant correlation between personality score and white cell count in any of the separate smoking habits shown in the table. Incidentally, a χ^2 test showed no significance between the distribution of men by personality group and smoking habits, so that there appeared to be no particular relationship between smoking habit and personality trait. The finding of high leucocyte counts in heavy cigarette smokers in itself provides no evidence that such smokers are subject to higher morbidity or mortality.

Mean White Cell Count (mm^3) of Male Manual Workers aged 40-54 by Smoking Habit and Personality Score (Numbers of Men in parentheses)

Smoking Habit	Personality Score (M.H.Q.)		
	0-12	13-24	25 and over
Never smoked	5,470 (3)	6,070 (8)	5,450 (4)
Ex-smoker	6,100 (41)	6,130 (90)	6,530 (49)
Cigar/pipe only	6,100 (14)	5,920 (28)	6,320 (29)
Less than 20 cigarettes daily	7,330 (79)	7,250 (139)	7,060 (86)
20 or more cigarettes daily	7,400 (23)	7,370 (63)	7,490 (48)

The available data also confirmed Cattell's findings⁸ that there was no striking or simple correlation between personality score and blood group (A, B, O, AB), nor was there any significant correlation between these factors in any single smoking habit.

One possibility which has to be borne in mind is that the M.H.Q. is not adequate or sensitive enough for the purposes con-

sidered here, and for this reason it would be useful to have further data using other psychological tests.—I am, etc.,

R. W. HOWELL

Reading

¹ Howell, R. W., *Lancet*, 1970, **2**, 152.

² Corre, F., Lellouch, J., and Schartz, D., *Lancet*, 1971, **2**, 632.

³ Friedman, G., Siegelant, A. B., and Seltzer, C. C., *Archives of Environmental Health*, 1973, **26**, 137.

⁴ McGarry, J., *British Medical Journal*, 1974, **1**, 160.

⁵ Crown, S., and Crisp, A. H., *British Journal of Psychiatry*, 1966, **112**, 917.

⁶ Howell, R. W., and Crown, S., *British Journal of Industrial Medicine*, 1971, **28**, 126.

⁷ Howell, R. W., *Lancet*, 1970, **1**, 1343.

⁸ Cattell, R. B., Young, H. B., and Hundleby, J. D., *American Journal of Human Genetics*, 1964, **16**, 397.

Factors Affecting Recognition of Infant Leukaemias and Lymphomas

SIR,—The purpose of this letter is to draw attention to some epidemiological data which suggest that when haemopoietic neoplasms combine embryonic origins with rapid growth rates they cause disturbances of fetal erythropoiesis and leucopoiesis or invisible damage to the reticuloendothelial system which prevents smooth passage from a prenatal to a postnatal environment and thus allows leukaemia and lymphoma to be causes of unexpected (and unexplained) stillbirths and infant deaths. The data also suggest that the reason why childhood leukaemias are more often lymphatic than myeloid is because the latter have faster growth rates than the former, thus allowing the cases which are exceptionally difficult to recognize (because they have reached an advanced stage of preleukaemia by birth) to consist mainly of myeloid embryomas.

The possibility of there being unusual modes of dying when birth coincides with a late phase of preleukaemia has been envisaged ever since Kneale discovered that though it is relatively common for infants to die from leukaemia within a year of having a pulmonary infection, nevertheless preleukaemia deaths before 2 years of age are far less often ascribed to pneumonia than are later deaths.¹

Following these observations data from the Oxford Survey of Childhood Cancers (O.S.C.C.) were examined for evidence of unrecognized leukaemia deaths among children who had been exposed to a relatively high risk of dying during labour (when survival depends upon there being ample reserves of fetal haemoglobin); also among children who run a high risk of dying from infections within six months of birth (when survival depends upon passive immunity being replaced by active immunity). For example, twins are more likely to die during labour than singletons, and the risk is greater for monozygotic than dizygotic twins, and also greater for second deliveries than first deliveries. In addition, babies who are born during the period when summer conditions are being replaced by winter conditions (that is, during the second half of the year in the northern hemisphere or during the first half of the year in the southern hemisphere) have a higher than average risk of dying from respiratory infections during infancy (a) because they have longer exposure to winter conditions

Relations between Season of Birth and Subsequent Seasons

Periods	Calendar Months of Birth	No. of Months Exposed to:	
		Winter Conditions (Oct.-March)*	Summer Conditions Apr.-September)*
Neonatal	January-June	3	3
	July-December	3	3
	April-September	—	6
	October-March	6	—
1-5 months	January-June	6	24
	July-December	24	6
	April-September	15	15
	October-March	15	15
6-11 months	January-June	27	9
	July-December	9	27
	April-September	15	21
	October-March	21	15

*Northern Hemisphere only.

between 1 and 6 months than children who are born in other seasons (see table); and (b) because respiratory infections are twice as common in winter as in summer and cause twice as many deaths between 1 and 6 months as during the rest of infancy.²

The first study revealed a deficit of childhood leukaemias among the O.S.C.C. twins who were not x-rayed before birth which affected like-sex twins (60% deficit) more than opposite-sex twins (30%);³ also second deliveries (62%) more than first deliveries (34%).⁴

In the second (unpublished) study⁴ the O.S.C.C. cases were compared with children whose deaths were either unexpected and unexplained (cot deaths) or were ascribed to pulmonary infections. The relevant findings relate to deaths within six months of birth because this is the period most affected by the switch from passive to active immunity and also the period when the risk of an infection death is most strongly influenced by season of birth (see table). Among the cancer deaths in this age range there was a deficit of births in the second half of the year which affected leukaemias (54% deficit) and lymphomas (46%) far more than other cancers (3%). And among the other deaths there was a deficit of births during the first half of the year which affected the unexplained deaths (47%) more than the deaths which were obviously caused by infections (35%).

Finally, the unpublished O.S.C.C. data⁴ showed that there was a rapid replacement of myeloid by lymphatic leukaemias after the second month of life. For deaths within two months of birth the myeloid to lymphatic ratio was 3.50; for deaths between two and six months the ratio was 0.69; and for later deaths it was 0.41.

To sum up, it clearly requires more than epidemiological data to establish the existence of a group of haemopoietic neoplasms which are associated with such profound disturbances of the reticuloendothelial system as to be causes of unexpected and unexplained stillbirths and infant deaths. There are, however, indications that myeloid leukaemia has remained a rare cause of childhood deaths only because cases with embryonic origins are exceptionally difficult to recognize; also indications that it is only during the period when passive immunity is operative that there is any relaxation of these diagnostic difficulties.—I am, etc.,

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² Registrar General's Statistical Review for England and Wales for 1970, Tables, pt. I Medical. London, H.M.S.O., 1972.

³ Stewart, A. M., *British Journal of Cancer*, 1973, 27, 465.

⁴ Oxford Survey, U.S. Public Health Service and the Medical Research Council. Unpublished data.

Septic Abortion and the Dalkon Shield

SIR,—The Dalkon Shield intrauterine device has now been on the market in the U.K. for approximately three years and for one year longer in the U.S.A. and up to the present time approximately 2½m. insertions have taken place.

Recently it has come to the attention of my parent company in the U.S.A. that there has been an apparent increase in the number of cases of septic abortions, many mid-trimester in timing, occurring in patients purportedly wearing the Dalkon Shield. Four fatalities have been reported but there is no evidence of a direct cause-and-effect relationship between the wearing of the Dalkon Shield and the occurrence of septicemia. I am certain that the apparent increase is due more to the increased number of physicians and women who prefer this method of contraception than to any inherent fault in the Dalkon Shield itself.

We are of course exploring every reasonable approach to determine whether any unique relationship exists between the Dalkon Shield and septic abortions and in this connexion I would be most grateful if any cases which occur in patients could be reported to me with as full details as possible. In the meantime I feel that the following precautionary steps should be followed in the management of patients:

(1) Every patient who misses a menstrual period should have a pregnancy test.

(2) As soon as a pregnancy is confirmed the device should be removed if it is possible to do so by traction with the string.

(3) If the device cannot be so readily removed serious consideration should be given to offering the patient a therapeutic abortion.

(4) If the pregnancy is allowed to continue, whether or not the device is removed, the patient should be followed very closely for early signs which will alert the physician to potential severe complications.

It is suggested that all patients in whom a Dalkon Shield is considered for contraceptive purposes, should be advised prior to insertion that a therapeutic abortion may be recommended in the event of an accidental pregnancy.—I am, etc.,

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Can I Have an Ambulance, Doctor?

SIR,—Dr. D. E. Ford (4 May, p. 278) suggests, on the basis of our paper (9 February, p. 226) that outpatient physiotherapy at Northwick Park Hospital is likely to be ineffective because of its infrequency. This raises several points.

First of all, this was not physiotherapy at Northwick Park Hospital, but was in fact physiotherapy at the Harrow Physical Treatment Centre. Because we had the opportunity to take over this unit for a short time before the opening of the physiotherapy department at Northwick Park Hospital, it seemed to us to be an excellent opportunity to carry out a number of surveys.

Secondly, of course, we were referring to the minority (12% of patients) who require ambulance transport. These tend to be the elderly (50% were over the age of 65).

A further point is that it has never been convincingly demonstrated that the presumed effectiveness of physiotherapy depends upon its frequency of application by the therapist. On the contrary, in an ongoing trial concerning the value of outpatients with strokes this appears to be not so. Well-instructed patients who do not attend the department seem to be doing at least as well as those who are attending five whole days per week.

Until Dr. Ford and his colleagues have demonstrated the comparative value of his basic 47-hour week (37 hours in the department and 10 travelling), despite the resultant social inconvenience, we would prefer to emphasize the teaching role of the physiotherapist at the present for this type of patient.—We are, etc.,

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Assessment of Surgical Treatment

SIR,—Your leading article "Do We Know What We Are Doing?" (13 April, p. 73) on the supposed continuing difference between physicians and surgeons was at least more restrained than the American article to which it referred.¹ Cast more in the style of a hospital pantomime than in the language of a scientific journal this asserted that there was a double standard, both in practice and in clinical journals, in regard to the assessment of medical as distinct from surgical treatment. But is the distinction really as clear-cut as that?

In medically developed countries well-balanced teams of physicians and surgeons are now the rule, at least where major specialist enterprises are being undertaken. I have recently pointed out that the physicians in such teams are often the enthusiasts who are pressing reluctant surgeons to operate.² Surgeons deserve sympathy rather than scolding, because their position is peculiarly difficult. They are exposed to pressure for action from both colleagues and patients; any surgical operation is still a dramatic experience for the individual who undergoes it, and patients naturally cherish high expectations of its result. In spite of these difficulties academic surgeons of standing frequently undertake controlled trials when the value of an

¹ Kneale, G. W., *British Journal of Preventive and Social Medicine*, 1971, 25, 152.