to date found methylmethacrylate cement to cause worrying problems in the anaesthesi- 
metric management of total hip arthroplasty. In 
notion of such difficulties in these operations is safe, but an expert 
appraisal of the degree of plasticity of the 
mixed cement and the choice of the exact 
method for its introduction are, in our opinion, the important factors which ensure 
this freedom from complications.—We are, 

G. J. C. BRITAIN 
D. J. RYAN 

Regional Centre for Hip Surgery, 
Wrightington Hospital, 
near Wigan, Lancs. 

1 Phillips, H., Cole, P. V., and Lettin, A. W. F., 
2 Peetles, D. J., Ellis, R. H., Stride, S. D. K., 
and Simpson, B. R., British Medical Journal, 
1972, 1, 14. 
3 Ellis, R. H., and Dandy, D., British Medical 
Journal, 1972, 2, 713. 
4 Ellis, R. H., and McVicrein, J., British Medical 
Journal, 1972, 2, 528. 
5 Cade, D., et al., British Medical Journal, 1972, 
4, 107. 
6 Grahame, L., Acrylic Cement in Orthopaedic 
7 Cole, T., and Dandy, D., British Medical 
Journal, 1972, 4, 231. 

Radiography of Potentially Pregnant Females 

Sir,—Without wishing to deny the general 
Desirability of minimizing the exposure of the 
embryo and fetus to ionizing radiation, I fear Professor G. M. Ardran and Dr. F. 
H. Kemp (18 November, p. 422) might be 
basing their proposals on shaky foundations. 
They say that "... it is now universally 
accepted that radiation to the fetus can 
cause leukaemia or other neoplastic disease." 
In an editorial comment on a paper by Bross 
and Natarajan1 MacMahon wrote: "Implicit 
in the interpretation of their findings ... is 
the view that low-level prenatal irradiation 
indeed causes leukaemia. Although accepted 
by many (at least provisionally), this 
interpretation is not the only explanation of 
the existing evidence." A very recently published 
report of the United Nations Scientific 
Committee,2 which Professor Ardran and Dr. 
Kemp have seen, contains the following: 
"Thus, although children born from 
mothers x-rayed while pregnant seem to 
have an increased risk of cancer after birth, 
a positive causal relationship is not at 
least part of, it is caused by factors 
other than radiation... " 

These quotations suffice to show that Pro-
fessor Ardran and Dr. Kemp's claim of 
"universal acceptance is unjustified. How-
ever, even if it should subsequently be 
established that irradiation of the fetus does 
not cause childhood leukaemia, other possible 
consequences must not be overlooked. If 
experiments on mice can be used as a guide 
(see reviews by Upton3 and Rugh4), develop-
mental abnormalities can be expected to be 
a hazard of fetal irradiation in man. Some 
of radiotingesting mice are supported by 
follow-up studies at Hiroshima; thus all 
six survivors who were exposed within 1,200m 
of the nuclear explosion between the 7th and 
hours of gestation developed microcephaly.5 It remains to be determined 
whether small doses (~1 rad) of fetal 
irradiation produce developmental abnormalities. They might do so and this could 
be used as an argument to justify the proposals 
advanced by Professor Ardran and Dr. Kemp. 
—I am, etc., 
P. R. J. BURCH 

The General Infirmary, 
Leeds 

1 Bross, I. D. J., and Natarajan, N., New England 
Journal of Medicine, 1971, 283, 287. 
2 MacMahon, B., British Medical Journal, 
1972, 3, 287, 144. 
3 United Nations Scientific Committee. Ionizing 
Radiation, Levels and Effects, Vol. II, p. 428, 
4 Upton, A. C., Radiation Injury, Chicago and 
5 Rugh, R., Radiology, 1971, 99, 433. 
6 Miller, R. W., Pediatrics, 1956, 18, 1. 

Infectious Mononucleosis and Depression of 
Cellular Immunity 

Sir,—We wish to present evidence of de-
creased cellular immunity, measured by 
the tuberculin skin reaction, in 17 patients 
admitted to hospital with infectious mono-
nucleosis in whom the diagnosis had been 
confirmed haematologically or antigenically, 
or both. All but one patient had received 
antibiotics before admission. All patients 
had been B.C.G.-vaccinated before they 
were 1 year old and in 14 the results of 
earlier tuberculin tests were known (see Table). 
The date of onset of the disease varied from 
5 to 20 days before admission and the duration of fever varied from 9 to 
26 days. 

On admission each patient was injected 
intradermally on the dorsal surface of the 
forearm with 2 tuberculin units (TU) of 
purified protein derivative (P.P.D.). There 
were no skin reactions in any patient at 72 
hours. The P.P.D. test (2 TU) was repeated 
in 10 of the patients at different times after 
recovery from infectious mononucleosis. The 
time after recovery when the test was made 
in each case and the reaction are given in the 
Table. Patient 9, who was non-reactive 
three weeks after recovery, had had only a 
weakly positive reaction to 2 and 5 TU of 
P.P.D. 28 and 35 days before the onset of 
infected mononucleosis. He had previously 
been revaccinated 13 days before his illness. 
Patient 10 was non-reactive to 2 and 5 TU 
of P.P.D. 4 months after recovery and 
was therefore revaccinated. 

Transient depression of the tuberculin 
reaction has been noted in measles6 and 
with viral vaccines.7 During the acute stage 
of Mycoplasma pneumoniae infection the 
P.P.D. skin reaction is also negative (G. 
Stern, personal communication). Pro-
longed depression of the tuberculin reaction 
has been noted in some diseases of unknown 
etiologic context—e.g., sarcoidosis—in 
which raised E.B.V. titres have been 
reported8 and in Hodgkin's disease. The 
phenomenon expresses a general depression 
or lack of immunological reactivity of the 
delayed type. It seems from our findings 
that cellular immunity may be depressed for 
less than two months in infectious mono-
nucleosis. 

Thymus-derived (T) lymphocytes together 
with macrophages are considered the main 
reactors in the delayed type of immune 
reaction. If we accept T-cell reactivity as 
indicating P.P.D. skin reaction the find-

ings suggest a disturbance in the function of 
T cells during infectious mononucleosis. 

Earlier in vitro studies9 have shown that 
lymphocytes could not be stimulated by 
phagohagglutinin (PHA), which is con-
idered to be a T-cell stimulator. Taken 
together, these findings suggest either that T 
cells are not present in peripheral blood or 
that they are present but functionally de-
fective, possibly owing to alteration by the 
virus. On the other hand, the function of 
bone-marrow derived (B) lymphocytes, as 
judged by increased immunoglobulin levels 
in infectious mononucleosis10 and also in 
sarcoidosis,11 seems to be undisturbed de-
spite the fact that many of the established 
E.B.V.-carrying cell lines contain immuno-

globulin types on which B.C.G. cell 
proliferations are B cells. Possibly, therefore, E.B.V. 
primarily infects both types of lymphocytes but 
changes, decreases, or destroys some T-cell 
functions while B cells are unchanged or 
stimulated (producing heterophile antib-
odies in vivo or forming cell lines in vitro). 

A virus-induced T-cell defect may also 
account for atypical cell-mediated immune 
responses against infection. The milliary 
form of tuberculosis after measles is well 
known. Sarcoid reactions and sarcoidosis 
may also be atypical responses against 
several different but less deleterious antigens 
—e.g., example, B.C.G. If we accept this 
reasoning it was perhaps unwise of us to 
revaccinate patient No. 10 so early as four 
months after infectious mononucleosis, thus 
introducing B.C.G. antigen. We shall follow 
up the two revaccinated patients to see if 
they develop sarcoidosis in the future.—We 
are, etc., 

K. LANTORP 
Dunderr Hospital 
B. WAHREN 
State Bacteriological Laboratory 
A. HANNGREN 
Karolinska Hospital, 
Stockholm, Sweden 

1 Bensent, J. W., Tubercle, 1953, 34, 34. 
2 Brody, J. A., Overfield, T., and Hammet, L. M., 
New England Journal of Medicine, 1966, 271, 
1974. 
3 Hirschau, Y., et al., New England Journal of 
Medicine, 1970, 283, 502. 
4 Phillips, H., Cole, P. V., and Lettin, A. W. F., 
5 Upton, A. C., Radiation Injury, Chicago and 
6 Miller, R. W., Pediatrics, 1956, 18, 1.
Certification of Cot Deaths

Sr.-We wish to express our concern which may have been given in the article on the "Welfare of Families of Children Found Unexpectedly Dead" (4 March, p. 612) that in these cases the diagnosis of "cot death" or "sudden unexpected death in infancy" should not be given on the death certificate and that the most likely cause should be stated instead. This is not our intended wish.

We recommend that the information "sudden death" should be put on a death certificate but that it be entered as secondary information, not as the cause of death. In the absence of death in infancy the pathologist considers the most likely after all aspects of the case have been considered such as:

Example 1—(a) Acute cardiopulmonary failure due to 1/10 acute infection of respiratory tract (Haemophilus influenzae) (sudden unexpected death in infancy). Such a case was one in which there was pulmonary oedema, but no pneumonia or bronchitis was found on histological examination. There were minimal inflammatory changes in the nasopharynx and H. influenzae was grown from the respiratory tract.

Example 2—(a) Oedema of the lung and acute cardiac failure due to 1/10 acute infection of respiratory tract (Haemophilus influenzae) (sudden unexpected death in infancy). Such a case was one who had had, perhaps, two or three stools prior to death. The oedema of the lungs was found two from the gut or respiratory tract, and there were no signs of inflammation in the gut, minimal hypoxic and fatty change in the liver, and some oedema of the lung.

Example 3—(a) Oedema of the brain with convulsions due to 1/10 gram-negative infection of the gut, with or without death in infancy. This child had had a possible convulsion and vomited once the day before death. The brain was swollen and the only other finding, apart from some oedema of the lung, was a small amount of fatty change in the liver.

Example 4—(a) Acute laryngotraechitis due to 1/10 acute infection of the respiratory tract (organism not identified) (sudden unexpected death in infancy). This child had some symptoms of a respiratory tract infection and showed a small amount of infiltration of the mucosa of the trachea and a small amount of oedema of the lung but no more than is likely to have been found or have occurred in a child who could well have recovered from the conditions. There was respiratory tract infection in this case.

If this registration practice is used, and some have been using it in recent years, the deaths will be primarily allotted to the likely underlying disease group (acute infection, bronchiolitis, gastroenteritis, etc.) but it will be possible to extract and analyse this whole group of unexpected child deaths in their own right. In this way it will be possible for the Office of Population Censuses and Surveys to study the incidence and the different underlying causes of this distressing syndrome.—We are, etc.,

JOHN L. EMMERY

The Children's Hospital, Sheffield

JOSEPHINE A. C. WEATHERILL

Office of Population Censuses and Surveys, London

Dangers of Diazoxide

Sr.-With reference to the comments of Dr. M. S. Knapp and his colleagues (28 October, p. 229) concerning the dangers of diazoxide it should now be realised that this agent was being used hydrophobic and in labour for two years. Initially the drug was compared with intravenous benzathine penicillin and found to be more rapid and more predictable in its hypotensive action. Bethanidine, like other adrenergic agents, is not identified. Hyperglycaemia in the neonate was not a problem. In the paper by Milner and Chouksey,2 who describe the complication of alopecia in the neonate when diazoxide was used in pregnancy. In the four patients reported the drug was added for an additional period of 10-20 days and in doses up to 800 mg/day. The dose delivered to the fetus under these conditions can therefore be high. Two of these patients were diabetics. I must again stress that diazoxide in our series was only used in labour and not for long-term therapy. We have now used the drug intravenously 68 times in 53 patients with severe hypertension in labour. In only 10 patients was a total of three injections (900 mg) necessary and during a period of less than 24 hours. There was no evidence of congenital abnormalities in the infant, nor was there any перинатальной morbidity that could be related to the use of the drug. It is worthy of note that since diazoxide has been in use at this hospital there has not been a case of eclampsia in a booked patient. The paper describing our experience is awaiting publication.

We have not used the drug by the oral route because of the reluctance of the distribu- tor in Australia to release it for purposes of rickets. They have been aware of the potential hazards of prolonged oral treatment with respect to carbohydrate metabolism and fetal complications.

In the report of our initial investigation we have suggested that the use of diazoxide in pregnancy should be avoided in diabetic patients and that it should not be used on a long-term basis, but only in labour, nor combined with other hypotensive agents. In this way the side effects are minimal and there does not appear to be any adverse effect on the fetus in our experience. With these guide lines the dose of the drug used by Milner and Chouksy2 and Boulos et al.3 will not be reached in labour.

It is contended that provided caution is exercised (as with any effective hypotensive agent used in labour) intravenous diazoxide is a valuable drug in the treatment of hyper- tension crises in labour.—I am, etc.,

C. A. Michael

University of Western Australia, Department of Obstetrics and Gynaecology, King Edward Memorial Hospital for Women, Subiaco, Western Australia

Nutritional Rickets in Immigrants

Sr.-In their criticisms of our short report on the biochemical response of Pakistani immigrants with late rickets and osteo- malacia to a chappatry-free diet (9 August, p. 446), Drs. S. P. S. Teotia and M. Teotia (11 January, p. 111) have not mentioned in their detailed studies which we have previously carried out on the pathogenesis of these conditions.1,2 These specify the biochemical, histological, and clinical criteria which were used to establish the diagnosis of rickets and osteomalacia. In view of our recently published account of late rickets and osteomalacia in the Glasgow Pakistani community (17 June, 1972, p. 663) it is not thought necessary to reiterate these criteria in detail. Previous studies have included investigations to exclude renal disease and maldigestion; no evidence for these conditions has been found.

Serum proteins are estimated routinely with estimations of serum calcium, inorganic phosphorus, and alkaline phosphatase in our laboratory and have invariably been within normal ranges.2 We have never been able to show any relationship to serum calcium values. We have previously published an account of serum alkaline phosphatase levels in white Glasgow school children.3 The levels found in rachitic Pakistani children are in most cases greatly in excess of these or of any published data on normal serum alkaline phosphatase levels.4 Teotia and Teotia imply that dietary deficiency of calcium and vitamin D may play a part in the aetiology of late rickets and osteomalacia in the Glasgow Asian community. Detailed dietary studies have shown no evidence for this hypothesis and the nutritional status of Pakistani and Indian immigrants in Glasgow is good. Other workers have confirmed our findings that the vitamin D intakes of Asian immigrants are far lower than those of the local white population.5,6 The suggestion that soft water may be involved in the aetiology of rickets and osteomalacia is untenable. These conditions have been reported from most major centres of immigrant popula- tion in the U.K. and not simply from a soft water area such as Glasgow.

We find it difficult to understand Dr. Teotia's and Teotia's dismissal of the role of dietary phosphate in the aetiology of rickets in the U.K. in view of the striking biochemical responses noted in our subjects. Since the only variable in our experiment was that of phosphate intake, this would seem to establish a prima facie case for considering this substance as of aetiological significance. The absence of any significant phosphate changes would make the results obtained so far, which confirm those of M. R. Wills and his colleagues.4 Our data have the additional interest that it supports the heterogeneous nature of the disease with other environmental or dietary factors of possible aetiological importance. This situation would not obtain if the subjects were transferred to a more phosphate-rich environment. We cannot, of course, speak authoritatively of rickets and osteomalacia occurring in the Indian subcontinent. The cases reported by Teotia and his colleagues were involved in the aetiology of these conditions in communities in which unleavened bread is consumed as a main source of cereal in an unprocessed state. The addition of vitamin D has been shown to be of benefit in this situation.7 Our own studies have been advanced by J. G. Reinhold8 and by Wills et al.9 perspicacious. Clearly, dietary phosphate is not the only possible cause of rickets and osteomalacia,