protection into proper perspective. When excessively "coned" views are taken, or an incomplete examinattion is performed, the dose to a patient may well be increased if more radiographs have to be taken or if the examination has to be repeated. There is no substitute for an efficient adequate examination carried out at the first attendance and a proper history taken by the doctor performing the examination.

As Dr. P. R. J. Burch (16 December, p. 668) said it is not yet universally accepted that prenatal radiation causes leukaemia or neoplasia. He pointed out that fetal irradiation may cause developmental abnormalities and quoted the findings from Hiroshima where eight survivors irradiated between the 7th and 15th weeks of gestation developed microcephaly.—I am, etc.,

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1 *Daily Mail*, 3 September 1973, p. 11.
2 Ardran, G. M., and Kemp, F. H., *British Medical Journal*, 1972, **4**, 422.

Surgery on Day Patients

SIR,—I would like to reject emphatically Mr. A. B. Cassie's suggestion that any extension of day patient surgery (8 September, p. 542) need involve a second class standard of patient care.

Having been responsible for the running of a surgical day unit for the past three years, I read memorandum (HM(73)32) with interest, and found nothing sinister in it. There is now abundant evidence that a large number of patients can be dealt with comfortably and with complete safety as outpatients. The types of case suitable are well documented, and there is no need and, indeed, no suggestion, that any expansion of this group of cases be made. What is quite properly suggested is that greater use should be made of this service for patients already recognized as being suitable for it. I submit that Mr. Cassie's claim that when safety and quality of care "are not prejudiced such arrangements are generally already implemented . . ." is simply not true.

In Coventry over 2,500 patients have been operated on annually in the surgical day unit over the past three years; the numbers are limited by the facilities, not by the number of cases suitable for day surgery. The standard of care has been such that no mishap causing serious anxiety has occurred. It may well be that similar numbers have been dealt with in Burnley, but I doubt if such implementation is widespread.

I am convinced that a well run day unit offers surgical care of first-class quality and safety, and it has a marked effect in shortening the surgical waiting list. Most patients waiting for operation worry about it to some extent, and some are distressed. A long wait in itself means to some people a second-class service, and any action aimed at reducing the wait should be welcomed and encouraged.

I agree with Mr. Cassie that eternal vigilance is required against possible interference by administrators in clinical matters, but I think his indignation and suspicion are in this case misplaced.—I am, etc.,

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False Interpretation of Fetal Heart Monitoring

SIR,—The availability of cheap disposable scalp electrodes has enabled more reliable continuous recording of the fetal heart rate during labour than that obtained from the use of external recording systems, since direct attachment to the fetus is possible at an early stage of cervical dilatation.

However, despite this facility we wish to draw attention to one limitation of this system of monitoring—that is, false interpretation of the heart rate due to interference with, or substitution of, the fetal pattern by maternal signals. It is possible that the maternal rather than the fetal rate may be recorded, giving rise to a false sense of security about the condition of the fetus. Such an occurrence is a possibility if the maternal rate is high and the fetal signal is weak or absent.

An example of this is seen in the figure below, where the rate recorded by the fetal scalp electrode is approximately 120 per minute, showing normal variations and free from decelerations. However, in this instance intrauterine death had occurred a few hours earlier, as assessed by failure to hear the fetal heart with a portable Sonicaid D205 machine and absence of bleeding on fetal blood sampling. The rate recorded by the scalp electrode was synchronous with the maternal rate throughout labour up to delivery of a stillborn infant. An explanation of this occurrence is as follows.

Normally the maternal signal is about one tenth of the strength of the fetal E.C.G. signal, the latter having a voltage varying from 30 μv to 800/μv. In order to cope with this range the monitoring apparatus is equipped with some means of adjustment so as to scale up or scale down the variations of signal strength to enable a good rate trace to be recorded. This is effected by either an automatic gain control or manually operated sensitivity control. If the fetal heart stops or the signals reduce in amplitude monitoring equipment with a manual sensitivity control will normally register a zero rate since the circuit will not be activated. However, if the sensitivity control is turned up the maternal signal may trigger the circuit in which case the maternal rate will be recorded, or alternatively a random rate without specific pattern may result from interference signals generated by other electrical equipment in the vicinity.

Equipment with an automatic gain control will automatically increase its sensitivity in the same situation until it can obtain a signal sufficient to operate its rate circuit and the same result described above may occur. If the fetal heart fails gradually, resulting in a fall in voltage, though not necessarily in rate, eventually the monitoring equipment may record the relatively stronger maternal signal. If the fetal signal varies below and above the strength of the maternal signal abrupt changes in rate may be seen on the trace and may precede a continuous maternal recording when the fetal impulse becomes irrevocably weak. Therefore when the maternal pulse rate is found to be high and in the range normally associated with the fetus, a check should be made to establish that the maternal rate is not the same as that indicated by the fetal scalp electrode.—We are, etc.,

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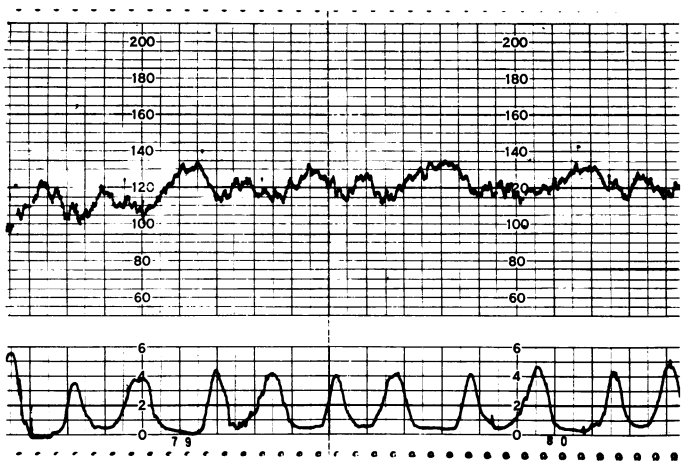
Risks of Small Dentures

SIR,—Small dental prostheses are becoming very popular. Their dangers are perhaps not sufficiently understood by those who wear them particularly during violent physical exercise.

Recently a patient arrived in the casualty department quite unable to speak and with some respiratory difficulty. While diving into a swimming pool he inhaled a small dental prosthesis on which two teeth were mounted and it became impacted in the larynx. There was no radio-opaque material included in the prosthesis and consequently nothing was visible on *x*-ray. When anaesthetized, the teeth could not be seen on direct laryngoscopy and, as they were not visible on subsequent bronchoscopy or oesophagoscopy, the patient was sent back to the ward on the assumption that the prosthesis would either pass on from the stomach or would have to be retrieved by gastrotomy. As the patient was asymptomatic the following day and requested to leave hospital, he was allowed to do so. However, hardly had he reached the street but he vomited and was once more unable to talk though there was little respiratory difficulty on this occasion. As the prosthesis was once more invisible on direct laryngoscopy, the patient was with a little difficulty intubated and oesophagoscopy was performed. No dental prosthesis was visible and laparotomy was performed but the teeth were nowhere to be found. The mystery was solved when the anaesthetist removed the intubation tube and on bronchoscopy they were located in the right main bronchus. Clearly they had been



Heart rate recording is shown on the upper tracing. The lower tracing records the pattern of uterine contraction.

pushed into the trachea during intubation. It was then rather difficult to remove the prosthesis without damaging the vocal chords.

Attention was recently drawn to this problem when Coman described three similar cases in Australia.[1] The most alarming situation was when a patient inhaled his partial denture at the beginning of a parachute jump.

There is an obvious need for greater awareness of the risks of wearing these prostheses. Various measures would minimize the risks to which the case described draws our attention. Firstly, there should be some radio-opaque material included in the prosthesis. Secondly, the incorporation of metal clips to attach the prosthesis to neighbouring teeth reduces the dangers of dislodgement—though such hooks are not without dangers. Coman describes a para-oesophageal abscess resulting from a hook causing the prosthesis to become stuck in the oesophagus for some three weeks. Thirdly, regular checks to ensure that the prosthesis fits well are essential.

It would seem a wise precaution to remove these potentially lethal pieces of apparatus before engaging in violent exercise and probably also at night. Neither of these pieces of advice was given to the patient in question. —I am, etc.,

HARVEY WHITE

London N.1

1 Coman, W. B., *Medical Journal of Australia*, 1972, 2, 1126.

The Cystic Meniscus

SIR,—The assertation in your leading article (1 September, p. 466) that "removal of the cysts alone results in a high proportion of recurrence" is not my experience in operating on 19 cases of cystic menisci without tear, treated by local excision of the cystic areas. Eighteen cases were followed up, all for more than two years and some dating back to 1961. No recurrence of the cystic condition was found. I agree that complete removal of the cysts and meniscus may sometimes be a difficult procedure. Removal of the cystic area leaving the intact meniscus spares the joint much trauma. The convalescence following preservation of the meniscus is quicker. The meniscus has important functions and should be preserved if possible. Removal of the cystic area relieves symptoms and gives a stable knee joint.

The patient is positioned as for meniscectomy with tourniquet. Incision is made over the centre of the swelling downwards and medially. The capsule is split in line with the skin incision. This is usually slightly more posterior than the capsule incision for lateral meniscectomy—that is, it is not through the weak area which is situated between the patellar tendon and the strong band which forms the medial margin of determination of the iliotibial tract. The capsule is undermined with a scissors. Oedema of the synovia overlying the cystic area is often noted. The outer margins of the cystic area are defined through the split capsule before anything further is done. A small transverse incision is made along the joint line—above the cystic area if possible. This opens the joint and with a three pronged retractor, the meniscus is pulled towards the operator. If a tear of the meniscus is present, the meniscus is removed together with the cystic area. If the meniscus is intact, the cystic degenerated area is cut cleanly off the meniscus with a knife. The raw area of the intact meniscus is inspected and if any glistening spots are present, they are scraped off with a knife until the remaining meniscus is clear of all little cystic areas. The capsule is closed without difficulty sometimes leaving a gap in the synovia, which does not seem to matter.—I am, etc.,

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Seat Belts

SIR,—To date, the seat belt balance sheet in Victoria, Australia, is impressive. On the one side is the compulsory fitting of seat belts in cars manufactured in the year 1969 and subsequently. On the other side is the lowered mortality and dramatically reduced incidence of eye injuries, facial middle third fractures and lacerations, spinal and head injuries, and crushed chests. Injuries caused by seat belts are minor compared with the certain death prevented.

No claim is made that the best designs are used, but it is known that the simple two-point lap belt is effective; the three-point lap-sash belt more so. And it is known that people will not wear seat belts until it becomes compulsory, as it is in any airliner taking off or coming in to land.

So definite is the evidence in favour of seat belts that the Road Trauma Committee of the Royal Australasian College of Surgeons now seeks extension of the legislation to make it compulsory that all occupants of all motor vehicles be restrained at all times. The design of a suitable harness for small children imposes a problem, but it is one that must be solved because of the merciless way that children are tossed about inside a motor vehicle which brakes sharply, or is involved in a collision.

Professor W. Gissane is correct when he concludes his letter (30 June, p. 772), by saying: "Perhaps, after all, the Australian legislators were right in introducing compulsory belt wear even at this stage of belt design development."—I am, etc.,

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Royal Australasian College of Surgeons

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Grades of Hypothyroidism

SIR,—We have noted the comments of Drs. R. L. Himsworth and Patricia M. Fraser (4 August, p. 295) and would like to take up the points they raise.

They claim that the group of subjects with subclinical hypothyroidism are the key patients in this group. We would not support this view, and would point out that the purpose of our original paper was merely to demonstrate that there is a spectrum of thyroid function between normality and overt thyroid disease. The placing of patients in categories was carried out to allow the data to be examined more easily. Clearly other classifications could be evolved with more or fewer categories, but it is our view that the definitions which we have suggested provide a practical classification for the further study of subjects with thyroid failure. More detailed studies in the future may demonstrate that some other classification is more suitable, which we shall then be very happy to adopt.

Drs. Himsworth and Fraser are quite correct in saying that we do not state the absolute upper limit of serum TSH in the normal population, and we would apologize for the incorrect reference. The upper limit of normal which we use is 4 μU/ml. The problem of defining a normal range is a complex one since all published TSH assays contain normal values which are derived from hospital populations, and the use of such data has considerable limitations.[1] This is particularly true in relation to thyroid disease in view of the high prevalence of undetected autoimmune thyroid disease and goitre in the general population. We are currently carrying out a large scale community survey to clarify this and other problems. It is, however, pertinent to raise two points which would suggest that the value we currently use is probably very close to the "true" upper limit of normal.

(*a*) A preliminary assessment of data from 236 subjects in our community survey reveals that values in excess of 4 μU/ml have been found in only seven subjects (2·9%) and only two of these values exceeded 5 μU/ml (5·8 and 7·0). The subjects reported in our paper had a mean serum TSH of 11·2 μU/ml, and 20% of these subjects had values greater than 20 μU/ml. Clearly there may be some overlap between our groups 3 and 4 and this was implicit in our description of a spectrum of thyroid function. However, nearly all these subjects had TSH values in excess (and often greatly in excess) of any value which we have observed in a normal subject.

(*b*) The subjects with subclinical hypothyroidism were selected on the basis of a raised TSH concentration alone, in the absence of symptoms. All but three of these subjects were later found to have circulating thyroid antibodies—emphasizing the presence of thyroid disease.

It is, of course, not possible to state with certainty the mechanism by which an elevated TSH is sustained in the patients with subclinical hypothyroidism. We would generally assume that such subjects were compensating for marginally reduced thyroid function by an elevated TSH. It seems likely to us that this is mediated through the circulating T4 and T3 concentrations since it has been demonstrated that very small variations in thyroid hormone concentration (within the normal range for the population) can have a major effect on TSH secretion.[2,3] We would agree that this remains an open question.

Finally, one must take issue with Drs. Himsworth and Fraser's last sentence. The term subclinical hypothyroidism does seem appropriate since the subjects were asymptomatic and had an elevated serum TSH concentration implying suboptimal circulating thyroid hormone concentration at hypothalamic-pituitary level. Clearly it is possible