are very uncommon and are probably fewer than when other methods are used.

Reports advocating its use have been published including recent series of cases from the U.S.A.,¹ Uruguay,² Holland,³ and Britain.⁴ Complications have been negligible. One advantage of the operation, most commonly performed as a prophylactic measure during operations for other abdominal conditions, is that it avoids cutting across the appendix with the risk of infection that this entails, as when the ligated stump is buried in the wall of the caecum under a purse-string suture.

The principle of the operation is to turn the appendix completely outside in, as one does with the finger of a glove, so that it comes to lie in the lumen of the caecum. It is usually done by stripping the appendix of its mesentery and turning in its tip with a probe, which is advanced until the appendix has completely disappeared into the interior of the caecum, leaving only a tiny depression. This is oversewn with a non-absorbable cross-stitch which also includes any remaining blood vessels going to the appendix, which will then slough off and be digested. Radiographic studies show that this happens after a week or so. In any event appendicitis cannot occur because of the changed anatomy.

Gynaecologists have most opportunity of incidental elimination of the appendix, and it has been my routine to do so in all appropriate cases during pelvic surgery. I have employed the inversion technique exclusively since 1958 and have used it over 1,000 times. In no case has there been any post-operative complication whatever and I am unaware of any at a later date. Colleagues who have adopted the same procedure have had similar results. I therefore support the view of Edelbohl's⁵ who in 1895 wrote: "Inversion of the normal appendix is so simple and easy a matter, withal in itself so devoid of danger, that the writer is prepared to advocate inversion of the appendix whenever for any reason the abdomen is opened. There are those surgeons who under the conditions just stated advocate ligature and removal of the normal appendix. How much more does their logic apply to the inversion of the entire appendix as contrasted with ligature and ablation."—I am, etc.,

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¹ Hallatt, J. G., *American Journal of Obstetrics and Gynecology*, 1958, 75, 1043.

² Lopez, M. B. R., *Archivos des Ginecologia y Obstetricia del Uruguay*, 1962, 20, 140.

³ Aartsen, E. T., *Nederlandsch Tydschrift voor Verloskunde en Gynaecologie*, 1966, 66, 100.

⁴ Young, H. B., and Goodhead, B., *Journal of the Royal College of Surgeons of Edinburgh*, 1972, 17, 55.

⁵ Edelbohl, G. M., *American Journal of the Medical Sciences*, 1895, 109, 650.

Multiple Prescribing

SIR,—It has been said that geriatrics is the art of taking patients off tablets. In the example I am reporting your readers may like to work out which tablets were treating the effects of others and in what order they were accumulated.

The patient, a 75-year-old woman whom I was asked to see at home because she was "arthritic and becoming unable to cope," was sitting in a chair, mildly confused, incontinent of urine, and un-

willing to walk because she had been falling often. The only physical abnormality of note was osteoarthritis of the knees. She said she was "on rather a lot of pills but was managing to get them all down." Inspection of her bedside table revealed tablets containing the following: (1) dextropropoxyphene and paracetamol; (2) phenylbutazone; (3) aspirin, codeine, and caffeine; (4) aspirin, magnesium carbonate, and aluminium glycinate; (5) aluminium hydroxide; (6) dicyclomine hydrochloride, doxylamine succinate, and pyridoxine hydrochloride; (7) alkaloids of belladonna leaf, ergotamine tartrate, phenobarbitone; (8) medazepam; (9) prochlorperazine; (10) calcium lactate; (11) sodium chloride; (12) Senokot; (13) ferrous sulphate; and (14) proteolytic liver and vitamin B₁₂. There were also liquid paraffin; chlorpromazine linctus; and a "vegetable treatment for rheumatism" containing watercress, celery, horse-radish, parsley, lettuce, and mint.

This patient was taking a total of 26 different drugs together with a liver paté and salad. Should this be entered in the *Guinness Book of Records*? She was admitted to hospital, all tablets were stopped, and she returned home fully mobile 10 days later.—I am, etc.,

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Intradermal Influenza Vaccination

SIR,—The possibility of achieving satisfactory immunization against influenza with a small intradermal dose of vaccine has obvious attractions, as Dr. J. D. Avison has pointed out (10 November, p. 358). Tauraso and others¹ showed that 0.1 ml of killed vaccine given intradermally with syringe and needle produced as good an antibody response as a standard 0.5-ml subcutaneous dose, but this method is unsuitable for mass vaccination. Jet injectors can be adjusted to deliver intradermally but the entire dose may not always be implanted in the skin, and their use in this way for vaccination with killed vaccines has been criticized.^{2,3} Recently we were able to assess this method using a Portojet gun. Though the results were not clear cut we think they are worth recording.

In two local boarding schools, one with 600 boys and the other with 240 girls, influenza immunization has been carried out each October for several years by the Schuco Jet Injection Service. In 1973, owing to manufacturing difficulties, there was insufficient vaccine to give both schools the usual 1-ml dose, so a decision was made to give a reduced dose intradermally. A volume of 0.15 ml was chosen on Schuco's recommendation, based on experiments showing that a leakage of 0.05 ml may occur with this method. Simultaneously a trial was conducted on 87 volunteers (51 boys, 8 girls, and 28 staff). They were divided into two groups—those born on odd dates were given 1 ml Admune vaccine subcutaneously, and those born on even dates 0.15 ml of the same vaccine or 0.15 ml Influvac intradermally. Each 1 ml Admune contained 400 IU A/England/42/72, 100 IU B/Vic. 98926/70, and 100 IU B/Hong Kong/8/73. Thus

0.15 ml Admune contained 60, 15, and 15 IU of the three viruses respectively. Each 0.15 ml of the Duphar vaccine contained 120 IU A/England/42/72, 60 IU B/Berkeley/1/71, and 60 IU B/Hong Kong/8/73. Blood samples from the volunteers were taken at the time of the inoculation and again three weeks later. Haemagglutination inhibition tests were run in parallel on the paired sera against three virus antigens: A/England/42/72, B/England/1/68, and B/Hong Kong/5/72. The method used was that described by Hoskins⁴ in which the reagents are used in 0.25-ml amounts in W.H.O.-type plastic agglutination trays.

Fewer people in the intradermal group showed a four-fold or greater rise of antibody to the three viruses than the subcutaneous group (table I), but the differences were not statistically significant. In the case of virus A preinoculation titres were generally high and this may have modified the overall antibody response, for even in the subcutaneous groups only about one-third of the subjects showed a four-fold antibody rise. Response to the B viruses was poor in both groups, even though initial antibody titres were low, and the proportion of the subcutaneous control group showing a four-fold rise was less than half that found by Schild and his colleagues.⁵ We can offer no explanation for this. Within the intradermal group responses to the Admune and Influvac vaccines were not significantly different, though surprisingly there seemed to be less response to the vaccine containing the larger amount of virus (Influvac). Reactions to intradermal inoculation were minimal and local discomfort less than with subcutaneous jet inoculation; also the need for preliminary skin testing of "allergic" patients was eliminated.

We believe that the economic and other advantages of this method merit its further assessment and that on existing evidence its use might well be justified when vaccine supplies are limited.—We are, etc.,

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¹ Tauraso, N. M., et al., *Bulletin of the World Health Organization*, 1969, 41, 507.

² *British Medical Journal*, 1970, 4, 64.

³ Roberts, T. E., *British Medical Journal*, 1973, 4, 738.

⁴ Hoskins, J. M., *Virological Procedures*, chap. 20. London, Butterworth, 1967.

⁵ Schild, G. C., et al., *British Medical Journal*, 1973, 4, 127.

Self-administered Clinical Questionnaires for Outpatients

SIR,—Reading Drs. J. M. Gumpel and A. M. S. Mason's interesting paper (27 April, p. 209) on medical questionnaires made me wonder again why they are so slow to catch on. Patients like them, and once one has used them in a clinic there is a real sense of deprivation if they are not available. It may be just conservatism that has delayed their more widespread acceptance, but I think the real reason is the feeling that forms equate with bureaucracy, a condition rightly

TABLE I—Antibody Responses

Vaccine Dose	No. of Persons Tested	No. (%) with 4-fold rise of H.I. Antibody		
		A/Eng/42/72	B/Eng/1/68	B/HK/5/72
1 ml subcutaneous ..	37	14 (38)	10 (27)	8 (22)
0.15 ml intradermal ..	50	12 (24)	10 (20)	7 (14)

TABLE II—Mean (Geometric) H.I. Antibody Titres before and after Vaccination

Vaccine Dose	No. of Persons Tested	A/Eng/42/72		B/Eng/1/68		B/HK/5/72	
		Before	After	Before	After	Before	After
1 ml subcutaneous ..	37	105	263	12	30	2.2	8.6
0.15 ml intradermal ..	50	81	175	14	36	2.6	8.9

regarded as incompatible with clinical medicine.

The construction of questionnaires remains a ticklish problem. I have recently attempted to simplify my own questionnaire¹ by identifying and rejecting redundant questions. A correlation matrix was drawn up from 100 consecutive completed forms. The matrix showed which pairs of questions were or were not obtaining substantially the same information from the patient. If they were, then one of the pair could be left out. Furthermore, even elementary cluster analysis of the matrix revealed significant grouping of symptoms. "Neurotic" and "senile" groups were easily definable, and a more detailed factorial analysis is at present being undertaken. The emergence of factors—that is, symptom patterns—raises interesting questions as these do not always seem to correspond to our preconceived notions of so-called objective diagnoses.

Anyone who uses questionnaires will soon find himself fascinated and stimulated by the light they throw on the theory and practice of the medical interview.—I am, etc.,

G. H. HALL

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¹ Hall, G. H., *British Medical Journal*, 1972, 1, 42.

Radiographic Location of the Dalkon Shield

SIR,—The use of radiographic methods to establish the possible expulsion or translocation of a Dalkon Shield entails considerable irradiation of the patient, especially if one of the "soft tissue" techniques suggested by Dr. Ursula E. Mountrose and Mr. L. Whitehouse (1 June, p. 503) is used and both anteroposterior and lateral films are taken.

In the majority of cases an ultrasonic scan of the uterus through a full bladder is all that is required.^{1,2} The procedure is quick, simple, and free from harmful irradiation.

The Dalkon Shield in the uterus is arrowed. The vagina (V) and bladder (B) are clearly seen.

All types of intrauterine devices can be readily shown (see fig.). If the uterus is empty, then x-rays will of course be necessary to exclude translocation.—I am, etc.,

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¹ Cochrane, W. H., and Thomas, M. A., *Radiology*, 1972, 104, 623.

² MacKay, D., and Mowat, J., *Lancet*, 1974, 1, 652.

Lactose Intolerance in San Populations

SIR,—In a recent paper (6 April, p. 23) we described the investigation of a San ("Bushman") population for lactose tolerance and animadverted on the possibility (to which others^{1,2} have drawn attention) that the supplementation with dried milk of the diet of peoples in which adult tolerance of lactose is very unusual might be inadvisable. We have recently investigated two further Khoisan peoples by the same methods and present a brief summary of our findings.

The populations investigated were:

(1) the ǀkhuā, a small San group found scattered in southern Botswana, the subject of some speculation regarding the affiliations of their language, which appears not to fall into any of the hitherto reorganized Bush groups;³ and (2) the Nama of Keetmanshoop, representatives of the largest extant group of Khoi ("Hottentots"), resident in the semi-desert south of South-west Africa. The ǀkhuā, like the !Kung, are not known ever to have been cattle-keepers or milk-drinkers; some of them do, however, live in a client/patron relationship with cattle-keeping Kgalagadi, and the latter, in common with the other Tswana, use both fresh and sour milk.⁴ The Khoi peoples first enter recorded history⁵ as cattle-keepers, and though the Nama of Keetmanshoop today possess few bovine cattle they do have an abundance of goats, whose milk they drink both fresh and sour.

Lactose tolerance tests were performed on 34 ǀkhuā, but nine were excluded from the final calculations because of close family relationship or technical faults. Of the remaining 25, two proved to be tolerant, giving a phenotypic frequency for lactose tolerance of 8%. With the exception of three children about 10 years old, all of them intolerant, all persons in the ǀkhuā series were adult. Among the Keetmanshoop Nama the results, after the exclusion of closely related individuals, showed a 50% frequency among children (4 out of 21); the difference was significant at the 5% level ($\chi^2=4.18$ for 1 D.F.).

The frequency of lactose-tolerant individuals in San populations seems to be turning out to be rather higher than the hypothesis put forward by Simoons,⁶ that lactose tolerance represents an advantageous adaptation consequent on the development of dairying, would lead one to expect. Moreover, the significant difference between adults and children among the Nama would appear to favour the possibility that induction of lactase in response to milk-drinking plays a larger part in the production of adult tolerance than has previously been supposed, were it not that the youngest member of our series, a 7-year-old, was lactose tolerant. It seems to us that our latest findings may be of some interest in the study of human evolution.

We should like to thank the Director, Professor J. F. Murray, and the Deputy Director, Professor J. Metz, of The South African Institute for Medical Research, as well as the Directors of Medical Services of Botswana and South West Africa, the medical superintendent and staff of Keetmanshoop Hospital and the District Surgeon, Keetmanshoop, the Rev. Fr. Jansen, the Sister Superior and staff of the Don Bosco Nama Laerskool, Keetmanshoop, Mr. Thompson of the S.A.I.M.R. Laboratories in Keetmanshoop, Mr. Tony Traill, the Ministry of Commerce and Industry, Gaborone, Botswana, and, of course, the 77 volunteers who made the whole project possible. The work of the unit is

supported in part by the Medical Research Council of South Africa.

—We are, etc.,

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¹ Cook, G. C., and Kajubi, S. K., *Lancet*, 1966, 1, 725.

² Jersky, J., and Kinsley, R. H., *South African Medical Journal*, 1967, 41, 1194.

³ Traill, A., *African Studies*, 1973, 32, 25.

⁴ Schapera, I., *The Tswana*. London, International African Institute, 1953.

⁵ Nienaber, G. S., *Hottentots*. Pretoria, Van Schaik, 1963.

⁶ Simoons, F. J., *American Journal of Digestive Diseases*, 1970, 15, 695.

B.M.A. and B.M.S.A.

SIR,—On behalf of past members of the British Medical Students Association, we would like to express our sincere gratitude to the B.M.A. for all the help that they gave the association over the years. We would also like to thank Mr. A. E. Vince for his hard work and forbearance in dealing with our many problems.—We are, etc.,

H. G. STURZAKER
J. E. P. SIMPSON
ALAN BAILEY
MICHAEL GARRAWAY

Harrow, Middlesex

Temporarily Dependent Patients in General Practice

SIR,—I would like to reply to the letters of Drs. Joyce E. Leeson and R. J. Robertson (18 May, p. 385). It is impossible to say whether the patients described in my article (30 March, p. 625) are ill or not ill in the absence of a universally accepted definition of illness; hence my use of such terms as "undiagnosed," "successfully untreated," and "ill in the accepted sense of the word."

These patients were called "temporarily dependent" because, having come to their doctor with no objective evidence of disease and having been given no pharmacologically effective treatment, they made no further effort to seek help either by returning to me, as they were invited to do, or to any of my three partners, as they could easily have done. The implication is that in that particular situation at that particular time they were in a state which was altered and improved by reassurance from their doctor. Dr. Robinson's point is well taken. It would have been more accurate to say "patients who received no pharmacologically effective treatment."—I am, etc.,

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Drugs and Xylose Absorption from Intestine

SIR,—Absorption of xylose from the human intestine has been reported¹ to be decreased by metoclopramide and increased by propantheline. These drugs also alter the absorption of paracetamol² and digoxin.³ These effects were thought to be due to delayed gastric emptying³ or to altered gastrointestinal motility.³ The indirect evidence quoted in support of this view does not ex-