remains obscure. Parish *et al.* (1960) have presented evidence of the presence in infancy of circulating antibodies to milk proteins and have attempted to relate them to the occurrence of sudden "cot death," resulting from aspiration of even small quantities of regurgitated cow's milk. They supported their view by animal experiments in which guinea-pigs sensitized to milk proteins by single intraperitoneal injection of milk died suddenly when small quantities of milk were introduced into the trachea. They postulated that circulating or other antibodies to milk might sensitize the tissues of babies.

We have sensitized guinea-pigs to each of the three milk proteins used in the experiments in this paper, employing the complete Freund adjuvant technique and multiple intradermal and subcutaneous injections. The dose of protein in each instance was 10 mg. Our findings are shown in Table XIII. Skin tests were positive at 42 days. Precipitating antibodies were found only in the case of lactalbumin. The coated-tanned-red-cell test was positive in high titre against the corresponding antigens in the case of casein and lactalbumin, but was positive only in low titre in the case of lactoglobulin.

TABLE XIII.—Findings in Guinea-pigs Sensitized to Individual Cow's Milk Proteins

Antigen	Skin Test (Performed 42 Days after Sensitizing Injection)	Precipitins by Gel- diffusion Test	Coated Tanned Red Cell Test Against Appropriate Antigen
Casein	+	—	1/20,000
α -Lactalbumin	Not done	+	1/20,000
β -Lactoglobulin	+++	—	1/200

The animal results differ sharply from the reactions in man. Skin tests to the common foodstuffs have been made by our colleague, Dr. R. M. Morris-Owen, in patients with ulcerative colitis and a control group of subjects, using proprietary test extracts. Occasional positive reactions were present in both groups of subjects, but there was no suggestion of an unduly high frequency of positive skin reactions in ulcerative colitis. Similar tests with the purified milk proteins have not yet been made.

Summary

A study has been made of some immunological reactions to purified cow's-milk proteins in ulcerative colitis and in health.

The Ouchterlony gel-diffusion test was uniformly negative.

The passive cutaneous anaphylaxis test in guinea-pigs was also negative.

The coated-tanned-red-cell test showed the presence of circulating antibodies in some normal subjects and in some patients with ulcerative colitis. The proportion of subjects showing antibodies in high dilution of sera was much greater in ulcerative colitis than in health.

Analysis of the data in relation to various clinical features of the 75 patients with ulcerative colitis showed that the increased incidence of high-titre reactions to milk proteins could not be explained on the basis of (a) age and sex of the subjects studied; (b) effect of a milk-free diet; (c) activity or quiescence of the disease; (d) radiological extent of the disease; (e) corticosteroid therapy. The one feature which has emerged is that, for casein only, patients in their first attack of ulcerative colitis resemble normal subjects and

a marked preponderance of high-titre reactions occurs only among patients with established chronic disease.

These findings are discussed in relation to immunological concepts of disease.

We are very grateful to Dr. R. Aschaffenburg for making a gift of the purified milk proteins used in this study. We thank Miss Marjory Alcock for technical assistance. We also thank our colleague, Dr. John Morton, and Dr. J. G. Feinberg, of Beecham Research Laboratories, who gave us technical advice on certain aspects of the study. Some of the expenses were covered by a grant from the Medical Research Council.

REFERENCES

- Andresen, A. F. R. (1942). *Amer. J. dig. Dis.*, **9**, 91.
 Asherson, G. L., and Broberger, O. (1961). *Brit. med. J.*, **1**, 1429.
 Borgström, B., Dahlquist, A., Lundh, G., and Sjövall, J. (1957). *J. clin. Invest.*, **36**, 1521.
 Boyden, S. V. (1951). *J. exp. Med.*, **93**, 107.
 Broberger, O., and Perlmann, P. (1959). *Ibid.*, **110**, 657.
 Du Bois, R. O., Schloss, O. M., and Anderson, A. F. (1925). *Proc. Soc. exp. Biol. (N.Y.)*, **23**, 176.
 Gunther, M., Aschaffenburg, R., Matthews, R. H., Parish, W. E., and Coombs, R. R. A. (1960). *Immunology*, **3**, 296.
 Ouchterlony, O. (1948). *Acta path. microbiol. scand.*, **25**, 186.
 Ovary, Z. (1958). *Progr. Allergy*, **5**, 459.
 Parish, W. E., Barrett, A. M., Coombs, R. R. A., Gunther, M., and Camps, F. E. (1960). *Lancet*, **2**, 1106.
 Perlmann, P., and Broberger, O. (1960). *Nature (Lond.)*, **188**, 749.
 Platt, J. W., Schlesinger, B. E., and Benson, P. F. (1960). *Quart. J. Med.*, **29**, 257.
 Schloss, O. M. (1924-5). *Harvey Lectures, Baltimore, Series XX*, p. 156.
 Thayer, W., Spiro, H. M., and Calabresi, P. (1960). *Clin. Res.*, **8**, 369.
 Truelove, S. C. (1961). *Brit. med. J.*, **1**, 154.
 Witebsky, E., and Rose, N. R. (1956). *J. Immunol.*, **76**, 408.

EARLY WEANING IN THE AETIOLOGY OF ULCERATIVE COLITIS

A STUDY OF FEEDING IN INFANCY IN CASES AND CONTROLS

BY

E. D. ACHESON, D.M., M.R.C.P.

AND

S. C. TRUELOVE, M.D., F.R.C.P.

Nuffield Department of Clinical Medicine,
University of Oxford

(From the Radcliffe Infirmary, Oxford)

During the past few years it has been found that some of the patients with ulcerative colitis attending the Nuffield Department of Clinical Medicine have shown a very beneficial clinical response when cow's milk and cheese have been entirely excluded from the diet. In five of these patients, milk or cheese has been reintroduced into the diet—in one patient on two separate occasions—and in every instance this was followed by a sharp clinical relapse of the ulcerative colitis. There was a strong positive correlation between the time the patient had been symptom-free on a milk-free diet and the time taken to relapse when milk was reintroduced (Truelove, 1961).

These clinical observations prompted us to consider a number of possible explanations. One of them was the possibility that liability to ulcerative colitis might have some connexion with artificial feeding in infancy. The present article is concerned with some observations we have made on this topic.

Material and Method

The material of the study consisted of all the patients with definite ulcerative colitis who attended the Nuffield Department of Medicine, either as in-patients or as out-patients, in the first six months of 1961. Patients in whom the disease had remained localized to the rectum or in whom the diagnosis was in doubt were not included. We were left with 152 patients with classical disease. Each of these was interviewed personally by one of us (E.D.A.) and was asked a number of standard questions, the answers to which were the basis of this paper. The questions were:

1. Were you breast-fed or bottle-fed from birth?
2. If breast-fed, how old were you when breast-feeding was stopped?
3. Is your mother or any other person with first-hand evidence about your infant-feeding alive and prepared to answer a postal questionnaire?
4. What is your (or your husband's or father's) exact current occupation?
5. How many live-born brothers and sisters did you have and what is your rank of birth in the family?

Where first-hand evidence was available the parent or other relative was sent an additional questionnaire by post, which asked for detailed information about the patient's feeding as an infant, including the date at which breast-feeding was stopped and the date at which artificial feeding was begun if this was different. With the questionnaire was sent a standard covering letter stating that the propositus was a patient of the department and that a research survey was being carried out to determine the infant-feeding history in our patients.

Control patients who were not suffering from ulcerative colitis were selected from general medical out-patients and in-patients of the Nuffield Department of Medicine. They were given an identical interview by the same person, and an identical postal questionnaire was sent to their relatives. They were matched for age and sex, and the two series of interviews ran concurrently.

It is convenient at this point to give definitions of the terms and conventions we used.

(a) A patient was regarded as having ceased to be breast-fed as soon as artificial feeding was started. Thus a period during which breast-feeding was supplemented by artificial feeds did not count as breast-feeding.

(b) Breast-feeding was considered to have been "established" if the patient was kept at the breast for more than 14 days (Douglas, 1950). In the interest of brevity those in whom breast-feeding occurred for 14 days or less are referred to as "bottle-fed."

(c) Where the answer to the first question in the questionnaire was "breast-fed but duration unknown" it was assumed that breast-feeding had been established for at least 14 days.

(d) Where the patient's account of his infant-feeding history conflicted with that of a witness (for example, his mother) the witness's account was preferred.

Results

It will be seen from Fig. 1 that in 92 of the ulcerative colitis cases and in 110 controls breast-feeding was established, and Table I shows that in 19 patients with ulcerative colitis and in 23 controls no information could be obtained about the infant-feeding history. The vast majority of these subjects were in the older age-groups (all but eight were born before 1912), and it was possible to discard them from the analysis without interfering with the age-balance of the two groups (Table II).

FIG. 1.—Distribution of early weaning in 132 cases of ulcerative colitis and in 129 controls in whom a history was obtainable.

TABLE I.—Duration of Breast-feeding

Stated Duration of Complete Breast-feeding	Ulcerative Colitis			Controls		
	First-hand Evidence	Other Evidence	All	First-hand Evidence	Other Evidence	All
Breast-feeding not established:						
0 weeks ..	20	4	24	7	2	9
2 weeks ..	15	1	16	8	2	10
Breast-feeding established:						
4 weeks ..	7	1	8	14	0	14
3 months ..	16	0	16	17	0	17
6 " ..	17	0	17	10	1	11
12 " ..	19	5	24	30	7	37
More than 1 year	3	1	4	4	0	4
Breast-fed, but period unknown	4	19	23	8	19	27
Total known ..	101	31	132	98	31	129
Unknown ..	—	—	19	—	—	23
Grand total ..			152			152

TABLE II.—Breast-feeding by Year of Birth

	-1911		1912-21		1922-31		1932 +	
	U.C.	Controls	U.C.	Controls	U.C.	Controls	U.C.	Controls
Breast-feeding not established	6 (18.2)	3 (9.7)	11 (33.3)	5 (18.5)	14 (43.8)	7 (17.5)	9 (26.5)	4 (12.9)
Breast-feeding established	27	28	22	22	18	33	25	27
Total ..	33	31	33	27	32	40	34	31
Unknown ..	16	19	3	3	1	1	0	0
Grand totals ..	49	50	36	30	33	41	34	31
Median year of birth ..	1904	1905	1918	1916	1926	1926	1941	1942

Figures in parentheses in this and other tables are percentages.

Of those in whom an infant-feeding history was obtained 18.2% of the ulcerative colitis patients and 7.0% of the controls had never been breast-fed ($\chi^2=7.42$; $0.001<P<0.01$) (Table I).

If those in whom breast-feeding occurred but was not established are added (that is, for 14 days or less) the difference is twofold and the proportions are 30.3% (ulcerative colitis) and 14.7% (controls). This difference is still highly significant ($\chi^2=9.05$; $0.001<P<0.005$) (Table III). A similar level of significance is obtained when only those cases in the two groups where first-hand evidence was obtained are considered ($\chi^2=9.90$) (Table I). If the proportions of the two groups weaned at 1 month are considered the difference largely disappears ($\chi^2=3.54$; $0.05<P<0.1$). The important difference between the groups is thus limited to the first few weeks of life.

Age and Sex.—The distribution by year of birth of patients in whom breast-feeding was not established is shown in Table II. The proportions were higher in the ulcerative colitis patients in all age-groups. This also held true for each sex considered separately. The figures also suggest that early weaning was commoner in both groups between 1912 and 1931 than it was either before or since.

Location.—The study was complicated by the fact that as a result of the department's special interest in ulcerative colitis these patients were drawn from a wider area than were the controls. For this reason the cases were divided at the outset into two groups: (a) those resident within the territory of the Oxford Regional Hospital Board (Group 1); (b) those from outside the region (Group 2).

Group 1 was matched with controls resident within the region and it was planned to match Group 2 with patients of similar age and sex from outside the region. In fact, only six control patients of the appropriate ages could be found from outside the region, and as the proportions of bottle-fed ulcerative colitis patients within and outside the region were closely similar (Table III) it was decided to make up the control numbers with patients from within the region. Table III shows the

cases broken down into Group 1 (ulcerative colitis patients resident within the region and matched controls) and Group 2 (the remainder). Significantly higher proportions of bottle-fed patients are found among the ulcerative colitis patients in each group.

The Group 1 cases were subdivided further by residence into urban (resident in Oxford or other municipal or urban districts within the region) and rural. While the proportions of bottle-fed controls were evenly distributed in town (16.1%) and country (17.0%), in the ulcerative colitis patients early weaning seemed to be more common in country (34.7%) than in town (25.9%), but this difference could easily be due to sampling error ($\chi^2=0.99$; $P=0.3$).

Social Class.—The current occupation of each patient, or in the case of women of the patient's husband, was taken as an index of social class and classified according to the Registrar-General's List (1950). In the control group the frequency of early weaning increased steeply from Social Class I to Social Class V (Table IV). A less striking trend in the same direction was seen in the ulcerative colitis patients. An excess of bottle-fed subjects occurred in the ulcerative colitis group in each social class except V, where the numbers are small and sampling error is large. The excess is less well marked in the lower social strata than in the higher. These trends are more clearly shown by compressing the data as has been done in Fig. 2.

Family Rank.—Because the length of lactation has been shown to vary slightly with the birth order of the infant (Douglas, 1950), each patient was questioned

FIG. 2.—Early weaning becomes more common as the social scale descends in both groups, but is commoner in ulcerative colitis patients throughout.

TABLE III.—Breast-feeding by Residence at Interview

	Within the Region		Outside the Region		All	
	U.C.	Controls	U.C.	Controls	U.C.	Controls
Breast-feeding not established	32 (29.9)	17 (16.5)	8 (32.0)	2 (7.7)	40 (30.3)	19 (14.7)
Breast-feeding established	75	86	17	24	92	110
Total	107	103	25	26	132	129
Unknown	15	19	5	4	20	23
Grand total	122	122	30	30	152	152
	$\chi^2=5.27$ $0.02<P<0.05$		$\chi^2=4.78$ $0.02<P<0.05$		$\chi^2=9.05$ $0.001<P<0.005$	

TABLE IV.—Breast-feeding by Social Class of Patient

Breast-feeding:	Ulcerative Colitis				Controls			
	Not Established	Established	Total	Unknown	Not Established	Established	Total	Unknown
Social class I	4 (24.0)	12	16	1	0 (0.0)	8	8	1
" II	8 (25.8)	23	31	3	2 (11.7)	15	17	2
" III	19 (32.2)	40	59	8	9 (13.2)	59	68	16
" IV	7 (41.2)	10	17	3	4 (18.2)	18	22	2
" V	2 (22.2)	7	9	4	3 (25.0)	9	12	2
Total	40 (30.3)	92	132	19	18 (14.2)	109	127	23
Social class unknown	0	0	0	1	1	1	2	0

about his rank in the family. This inquiry was regarded as of particular interest because it has often been said (though with no reliable evidence) that ulcerative colitis is unduly frequent in "only" children. It was found, however, that the proportion of patients who had been "only" children was similar in the two groups (ulcerative colitis 8.6%, controls 9.9%). Early weaning occurred more often in every group of ulcerative colitis patients except one, when classified by family rank (Table V).

TABLE V.—*Breast-feeding by Rank of Patient in Family*

Family Rank	Ulcerative Colitis		Controls	
	Breast-feeding Not Established (%)	Total No. at Risk	Breast-feeding Not Established (%)	Total No. at Risk
1st	38.1	42	17.4	46
2nd	28.0	25	17.2	29
3rd and 4th ..	39.3	29	6.4	31
5th and more ..	16.7	36	17.4	23
Total ..	30.3	132	14.7	129

Discussion

Possible Bias in the Data

We were surprised by the high proportion of patients and their relatives who gave unequivocal answers to questions about events in the remote past. However, it would be prudent to assume that even answers readily given about the period of nursing and the date of weaning were often inaccurate. Such inaccuracies could be expected to bias the result of the survey if they acted in one direction for one group but not the other, or in inverse directions in each group concurrently. No doubt many unknown factors influenced the relationship of the answers to the truth; but two obvious ones—namely, the interval between the events and the interview and the professional relationship between the interviewer and the patient (or his relative)—were identical for both cases and controls. In addition, no knowledge of the real reason for the survey was communicated to the patient in the personal interview, and a number of other questions not concerned with infant-feeding were asked. The possibility that the interviewer (E.D.A.) influenced the answers in one or other groups is fortunately ruled out by two considerations. In the first place, the majority (74%) of the answers to the crucial questions used in the analysis came from the postal questionnaire, and these were classified by an independent person who was also responsible for the matching by age and sex. Secondly, in the minority in whom the information from the personal interview was used (Table I, "other evidence") the trend in favour of an excess of early weaning in ulcerative colitis was less marked than in the remainder. Short of the possible bias mentioned above, any inaccuracies about the infant-feeding histories within the survey would tend to blur rather than exaggerate the differences which were found.

A more serious possibility is that the control patients were dissimilar to the ulcerative colitis patients in some important particular with a bearing on early weaning, and that this depressed the control frequency of bottle-feeding. According to the literature, important factors which inflate the frequency of early weaning are confinement at home rather than in hospital, social factors such as overcrowding in the home, a short interval between successive births, and being the wife of a

manual worker. Most of these factors are correlated with social class and are dealt with in Table IV and Fig. 2. In 1946 (*Maternity in Great Britain*, 1948) striking and unexplained differences in the early-weaning rate were found between different areas of Great Britain with comparable social conditions. For example, in that year 19% of mothers in Scotland did not start breast-feeding, as opposed to 7% in England and Wales, and there were other more local fluctuations. It is in respect of this variable that the present survey may be most open to criticism; for, in spite of the precaution taken of considering the ulcerative colitis patients from within the region separately from those outside the region, even within the region itself it was found that the ulcerative colitis patients were more likely to have come from farther afield than were the controls. However, some assurance can be gained from the fact that if the immediate area served by the Oxford United Hospitals be considered alone, early weaning was twice as common in ulcerative colitis patients (33.8%) as in controls (16.6%) ($\chi^2=6.13$; $0.01 < P < 0.02$). Unfortunately no help can be obtained from the literature because there are no published reports of the frequency of early weaning in the Oxford area before 1952, and even for this and subsequent years figures are given only for the frequency of breast-feeding at one and two months (Annual Report of Medical Officer of Health, Oxford, 1954). In the present study only 6% of the patients interviewed were born after the end of the second world war.

The only report dealing with infant-feeding trends in England over a long period is from Liverpool (Robinson, 1939). This study, based on large numbers of babies attending welfare clinics before the second world war, gives the percentages weaned by the end of the second week for the following years: 1918, 23.7; 1922, 25.1; 1930, 18.5; 1934, 15.7; 1937, 22.0. Even if no allowance is made for the fact that almost all of these babies were from Social Classes III–IV, the figures given are closer to those in our control group than in the ulcerative colitis group for corresponding years.

Possible Interpretations of the Findings

If the difference in the early-weaning rate found between patients with ulcerative colitis and controls is a real one, it may be interpreted in a number of different ways, but these may be classified logically into three groups.

1. A genetic or environmental influence operating in the mother *prior to weaning* in which early failure of lactation is associated with an increased susceptibility to ulcerative colitis in the child. Thus inverted nipples might be the manifestation in the mother of a gene inherited by the child which predisposed to ulcerative colitis; or breast abscess or some other early maternal illness resulting in failure of lactation might also affect the child.

2. A genetic or perinatal environmental influence operating on the infant *prior to weaning* (for example, prematurity) might prevent it from suckling and might be linked with a susceptibility to ulcerative colitis.

3. Early artificial feeding itself or an influence *resulting from it* might predispose to ulcerative colitis.

A detailed inquiry into the neonatal history of patients with ulcerative colitis is clearly the next step in unravelling these possibilities. At present the third group of possibilities seem most promising, and the most obvious of these are neonatal gastro-enteritis, psychological factors associated with deprivation of early

maternal care, and early exposure to foreign proteins. However, whatever the factor involved, it can only be expected to account for a minority of the cases of ulcerative colitis.

From a wider viewpoint, there is the interesting possibility that artificial feeding in the first few weeks of life may influence the liability to a number of diseases which occur in adult life. The ideal way to determine this would be to carry out a prospective study, but it is self-evident that the results would not be available for some decades. In the meantime the simple type of inquiry employed in the present study may be worthy of application to conditions other than ulcerative colitis.

Summary

The history of infant-feeding has been studied in 152 patients with classical ulcerative colitis and in an equal number of patients with other conditions matched for age and sex attending the Nuffield Department of Medicine during the same period. All the patients were asked a standard series of questions by the same interviewer. In 74% of the patients first-hand evidence was obtained from a witness (usually the mother) by means of a postal questionnaire.

It was found that breast-feeding had not been established in 30.3% of the ulcerative colitis patients and 14.7% of the controls, a difference which might occur by chance less than once in 500 times. However, when the groups were compared in terms of the proportions weaned by one month, no significant difference was apparent. When the ulcerative colitis group was compared with the control group in terms of year of birth, social class, residence at interview, and family rank a consistently higher proportion of patients who had been weaned within the first two weeks of life was found in the ulcerative colitis group.

These findings can be explained in a number of different ways, but the most likely interpretation is that early artificial feeding increases the liability to ulcerative colitis later in life. The theoretical and practical implications of this are briefly discussed.

We are indebted to Mrs. B. Hainge for matching the patients, classifying the answers to the postal questionnaire, and keeping the records of the study.

REFERENCES

- Annual Report of the Medical Officer of Health at the City of Oxford, 1954.
 Douglas, J. W. B. (1950). *J. Obstet. Gynaec. Brit. Emp.*, **57**, 335.
Maternity in Great Britain (1948). A Survey of Social and Economic Aspects of Pregnancy and Childbirth undertaken by a Joint Committee of the Royal College of Obstetricians and Gynaecologists and the Population Investigations Committee, Cumberlege, London.
 Registrar-General (1950). *Classification of Occupations*. H.M.S.O., London.
 Robinson, M. (1939). *Arch. Dis. Childh.*, **14**, 259.
 Truelove, S. C. (1961). *Brit. med. J.*, **1**, 154.

The Central Council for Health Education has issued a booklet, *Helping the Elderly to Live at Home*, which is intended to serve as an introduction to some of the problems involved for relatives who care for old people at home. In addition to what may be called "clinical notes," the booklet has useful sections on making use of the social services, a list of information leaflets, references, and a list of local organizations likely to be needed by relatives, with space left for addresses and telephone numbers. (C.C.H.E., Tavistock House North, Tavistock Square, London W.C.1, price 2s.)

ASSESSMENT OF THE RADIOTRIOLEIN TEST IN STEATORRHOEA

BY

A. G. COX, M.B., Ch.B.

Research Assistant, University Department of Surgery,
 Royal Infirmary, Sheffield

In the investigation of steatorrhea the fat-balance is generally regarded as the best means of assessing the severity and progress of the condition. However, there is general agreement that the fat-balance is a difficult test to conduct, and therefore alternative methods of obtaining the same information with less trouble have been proposed. One of these is the radio-iodinated triolein (RIT) test, which has received wide support in the last ten years.

Although differences in procedure are adopted by different workers, the principle employed is essentially that of a tracer test. A known dose of RIT is given by mouth, its excretion in the faeces is measured, and the result is expressed as a percentage of the dose. While quantitative agreement with the faecal chemical fat excretion is not claimed, many workers state that normal subjects excrete a low percentage of the dose, whereas patients with steatorrhea excrete a high percentage (Ruffin *et al.*, 1956, and others). Furthermore, it is claimed that the dividing line between faecal RIT excretion in normal subjects and in patients with steatorrhea is sharp enough to be of diagnostic value. The advantages of the RIT test are that it is easily performed, a standardized material is used, and faecal homogenization is unnecessary. Its obvious disadvantage is the possible danger inherent in the use of radioactive isotopes.

Further elaborations of the use of radio-iodinated lipids have been reported. The measurement of plasma levels of absorbed radioactivity (Berkowitz *et al.*, 1959) and the urinary excretion of ^{131}I (Walker *et al.*, 1960) have been advocated as useful parameters of intestinal function. Again, it is claimed that steatorrhea of digestive origin can be distinguished from one of absorptive origin by comparing the absorption of RIT with that of radio-iodinated oleic acid (Reemtsma *et al.*, 1957). Finally, other workers have used these materials as a means of investigating generalized atherosclerosis (Hall *et al.*, 1959), congestive cardiac failure (Mäkelä *et al.*, 1960), diabetes mellitus (Sandberg *et al.*, 1960), cirrhosis (Fast *et al.*, 1959), the nephrotic syndrome, and other hyperlipaemic states (Stanley and Thannhauser, 1949).

Despite widespread acceptance of the method, a search of the literature reveals a paucity of critical investigations designed to assess the reliability of the RIT test in the diagnosis of steatorrhea. Fierst *et al.* (1958) have found a correlation between the vitamin A absorption test and the RIT test. An alternative approach to this aspect of the subject is to compare the results of the RIT test with those of the standard fat balance. Although there have been many reports relating to the use of RIT, few have included this comparison (Grossman and Jordan, 1958; Lubran and Pearson, 1958; Playoust *et al.*, 1959; Pimparkar *et al.*, 1960; Vaughan Jones, 1960). This paper is a report of a further series of cases in which concurrent faecal chemical fat and faecal RIT excretion determinations were made.