

## THE CLIENTELE OF A CHILDREN'S HOSPITAL IN CAPE TOWN\*

A YEAR'S SURVEY OF THE PATIENTS SEEKING ADVICE, THEIR DISTRIBUTION WITH REGARD TO AGE, SEX, AND RACE, THE BROAD PICTURE OF THEIR NUTRITION, AND THE MOST COMMON KINDS OF ILLNESS

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It is common knowledge that malnutrition is world-wide in its incidence, but variable in different places in respect of its most striking features. In the past decade emphasis has been placed on protein malnutrition (kwashiorkor), and there has appeared to be a tendency to overlook the presence of non-specific nutritional subnormality. Yet even the layman knows that it exists and certain local investigations in the recent past aroused our curiosity concerning the general nutritional state of the local child population. To provide an answer of reasonable accuracy is a formidable undertaking.

The school population gives part of the picture.<sup>1</sup> The Child Welfare Clinics can supply material for another part,<sup>2,3</sup> but no really representative sample for the children of all ages can readily be found. It seemed likely that another piece of the mosaic could be obtained from a survey of the children reporting to the Red Cross War Memorial Children's Hospital. That was the background of this report.

At the same time, the opportunity was taken to collect other information concerning the frequency of a few selected types of complaints, and in general to discover what sort of demand the public made and what kind of service it was necessary to supply at a hospital designed exclusively for the treatment of children in the Cape Town area.

## MATERIAL

For this purpose, after consultation with various people and obtaining their ready offer of help, cards were designed and printed, and the necessary arrangements were made to collect information about each child who entered the hospital precincts during one 12-months' period. Each individual was 'processed' once only, on his first appearance in the 12 months of this study. His outpatient card was then marked, and if it re-appeared at a later date it was ignored. This may well have produced some fallacies about the incidence of different complaints, but the total number of children in the survey is large enough to reflect something probably very near the true state of affairs. That is the more likely since figures for the total attendances and the total number of individuals show that each child attended,

on the average, 3 times. Many must have appeared only once, since it is quite certainly known that the 'hard core' reported many times; usually with a recurrence of the same complaint.

The diagnosis attached to each card was made after the child left the hospital, when he had been seen, examined, investigated, and disposed of on the day of assessment, or on discharge if he had been admitted. There are not likely to be many gross errors in these considered judgments. The vast majority were made by doctors of registrar to consultant grade, and only a minority by junior or relatively inexperienced individuals.

The overall figures for the year show that 63,745 attendances were made by 20,272 individual children (Fig. 1). The scatter of ages gave the proportions for each year of age, not surprisingly with a preponderance of infants

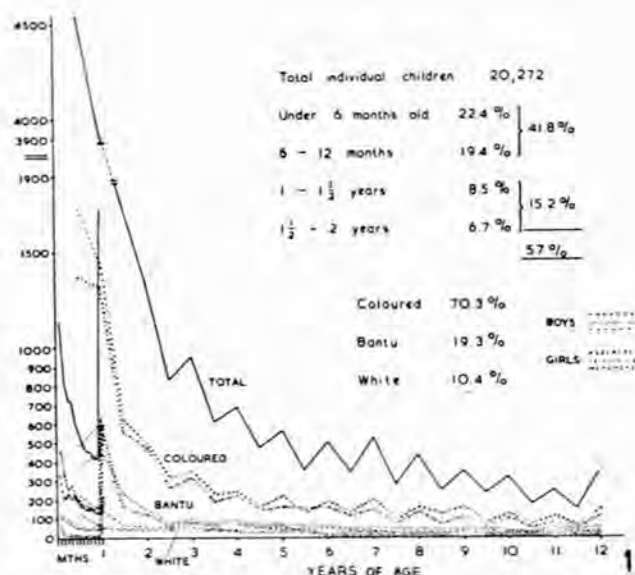


Fig. 1. Showing the attendance at the outpatient department during the year covered by the survey. The figures apply to individual children on their first attendance, and are divided into ages and the 3 main racial groups.

and toddlers. Those under 1 year made up 41.8%, and those under 2 years 57% of the children attending. The numbers of the older age groups were relatively small,

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though still adding up to a considerable total. There was no material difference between the numbers of boys and girls.

The race distribution was much as would be expected. The vast majority of the children were Coloured (70.3%), Bantu children totalled 19.3% of the patients, and only 10.4% were White. This should not, of course, be interpreted at anything other than its face value. The Whites are quite unrepresentative since, among other things, only certain groups are likely to come to the hospital—those who are privileged to do so by virtue of the father's association with the medical services, those who cannot afford to seek the services of a private doctor, and the relatively small number who are admitted for special diagnostic and therapeutic purposes. The Coloured children also are not quite representative, though much more so than the White children. Many of their families can and do pay for their medical attention, but they have no option when the question of hospitalization arises but to present themselves at a hospital, since no inpatient treatment is available elsewhere. The Bantu children are probably represented in their true light.

#### NUTRITION

##### Standard of Nutrition

With these reservations, the picture of the children's nutrition can be examined. It was necessary at the outset of the investigation to establish a standard of some sort, which would not be disputed, as a reasonable expectation of what any child in the 3 racial groups should attain. There does not seem to be in existence any definition of malnutrition, and one had to be designed which would suit all the ethnic groups encountered. The dividing line had to be so devised that no great difficulty would be met in checking the relationship of any particular child to the standard in the course of ordinary clinical work not associated with this study. There is only one generally available criterion for universal use, and that is the body weight. This is not entirely beyond criticism, since it will be vitiated by the presence of oedema, as in kwashiorkor; therefore the state of malnutrition in respect of weight was noted for every child, and kwashiorkor was listed separately.

The standard, for a variety of reasons which are not pertinent here, was fixed arbitrarily at two-thirds of the expected standard weight (50th percentile) for White children. This can be applied at any age, and the only information required is the child's date of birth. The weight can be ascertained quickly and easily. The weights referred to here are 'stripped' weights, i.e. the infants were naked, and other children were in a minimum of underclothing. No allowances of any sort were made and the child's disease was not known at the time of weighing. To facilitate rapid assessment of large numbers of records each day in the limited time which could be allotted to the task, charts were made on which the process took—literally—a few seconds (Figs. 2 and 3). In this way the state of nutrition was removed from individual opinion or bias. The standard is low, admittedly, but this is not objectionable, since any weight below this level really means a very poor standard of nutrition indeed. A child

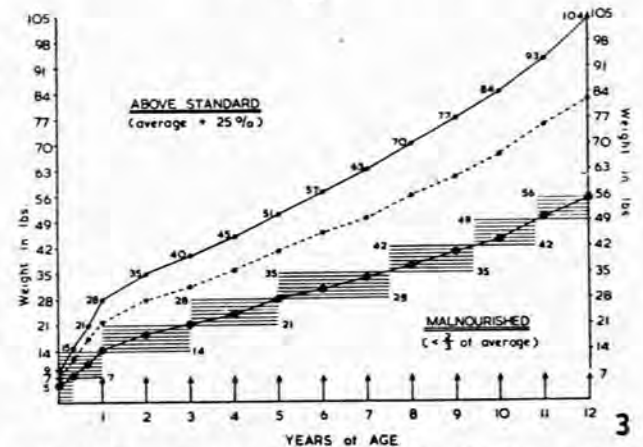
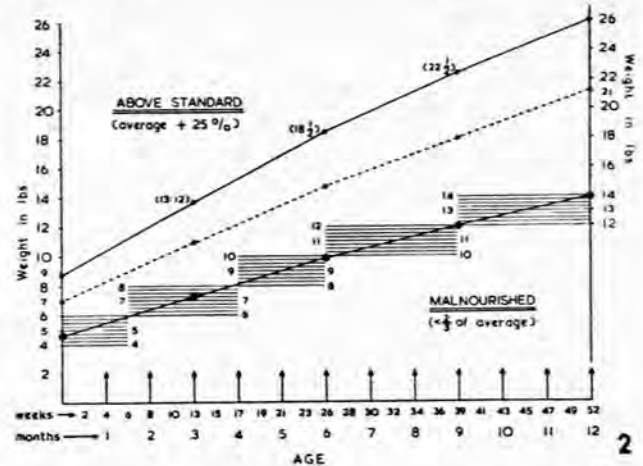


Fig. 2. Chart used for recording weight of infants under 1 year of age.

Fig. 3. Chart used for recording weight of children over 1 year of age.

with such nutrition is in a dangerously subnormal condition, quite apart from any disease which may be present.

Judged by this standard, the records showed that 1.9% of the White, 8.1% of the Coloured and 10.8% of the Bantu children were malnourished, i.e. had a non-acceptable weight or kwashiorkor. An earlier check on the nutritional state of inpatients had shown that 16% were malnourished by the same criteria. There is always a bigger proportion of such children inside the hospital, and the 2 assessments are quite compatible. It has not been possible until now to express numerically the malnutrition in the outpatient children, though it has always been obvious that it was relatively common.

##### Kwashiorkor and Malnutrition

Kwashiorkor as an entity occurred in 296 children. The total of malnutrition cases was 2,042 (Fig. 4). The two must be added together to arrive at the real total, and it appears from these figures that kwashiorkor represents only a small proportion, 12.5%, of the gross number of malnourished children (in Whites and Coloured 12.8%, and in the Bantu 12.07%).

The age incidence of kwashiorkor in this survey is strictly in accordance with the recognized pattern. There

were 151 boys affected, and 145 girls. The ratio of kwashiorkor to the total of malnutrition in each race showed a remarkable uniformity, and it would appear that its significance is very similar to that of an iceberg. For every patient with kwashiorkor one can confidently predict the presence of at least 7 more patients with severe general malnutrition. It is the obvious indicator of a dangerous but hidden menace.

OTHER DISEASES

The possibilities with regard to the classification of diseases were limited by the time which could be spent on the preparation of the data and on the machine-sorting. It was decided, therefore, to concentrate attention on a few chosen items and give the rest of the disease pattern in broad outline. This pattern showed (Table I) that there was a much greater demand and need for medical than for surgical care. Of the attendances, 68% were classed as medical, and 24% surgical, and of the specialties, ENT accounted for 2%, eye conditions 1%, and skin, heart and plastic cases 0.6% each.

The totals of certain types of illness were recorded for particular reasons. Investigation of these special illnesses for this survey had to be limited very strictly to allow the processing of the cards without overstraining the

TABLE I. HOSPITAL REPORTS FOR 1960—OUTPATIENT DEPARTMENT\*

Department	Patients' attendances	%
Medical .. .. .	47,748	68
Dermatology .. .. .	573	0.6
Cardiac clinic .. .. .	518	0.6
General surgical .. .. .	17,561	24
ENT .. .. .	1,384	2
Eye .. .. .	755	1
Plastic surgery .. .. .	520	0.6
Urology .. .. .	197	0.2
Thoracic surgery .. .. .	93	0.1

\* All the patients, admitted or not, passed through the outpatient department, and were recorded there.

census organization (Fig. 5). Therefore, the reasons for choosing each are given, together with the result of the count.

Alimentary Diseases

In a general children's hospital, it is deplorably obvious that a large proportion of the work is associated with the alimentary tract. This group included the largest number of cases and, of the total, almost 75% were brought to

hospital because of diarrhoeal disease. The seasonal peak level was prolonged, and extended from November to the end of May. Many of these children were severely dehydrated and had to be given parenteral fluid. The figures are shown in Table II. Virus stomatitis was the

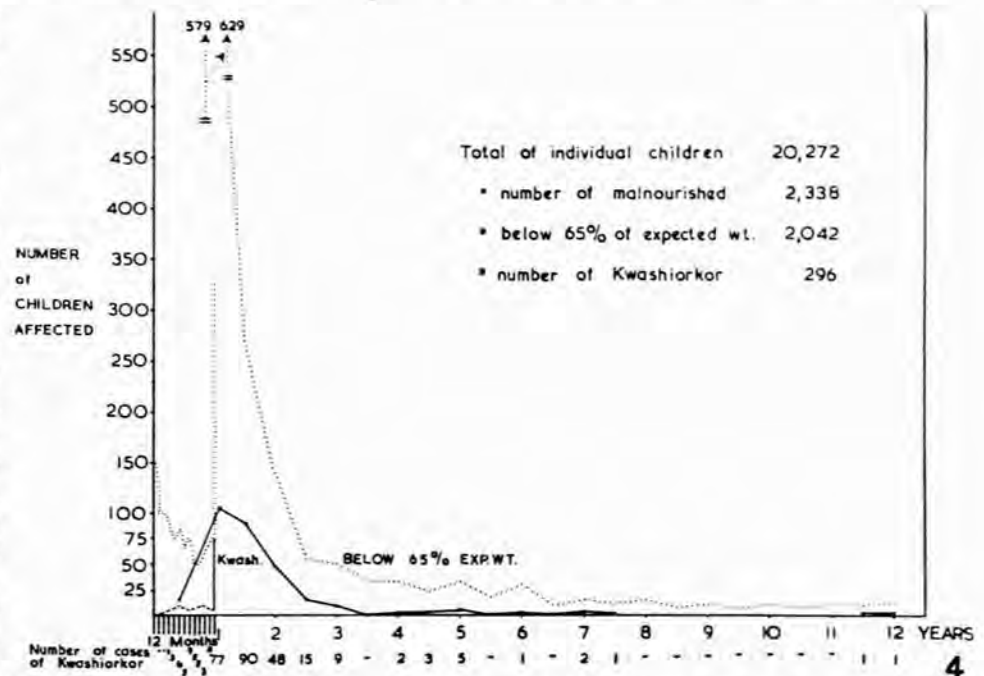


Fig. 4. Showing age distribution of children with malnutrition as a whole and with kwashiorkor.

TABLE II. ALIMENTARY DISEASES

Total of alimentary diseases .. .. .	6,338
Gastro-enteritis .. .. .	4,717
Number of 'drips' given in the year in the outpatient department .. .. .	4,500*
Intravenous .. .. .	3,600
Subcutaneous .. .. .	900
Virus stomatitis .. .. .	251

\* Includes repeated 'drips' given to the same individual. The total number of recipients was not noted, and was possibly half the above figure.

only other alimentary disease on which a special check was made. This is relatively common in Cape Town and, although the incidence was less than had been anticipated, 251 cases in a year is not negligible. It had no special seasonal variation.

Respiratory Diseases

The relatively equable climate of the Cape might be thought to militate against large numbers of respiratory diseases, but experience of inpatients belied this, at least in respect of the more serious types. The year's total of respiratory cases was 4,612; a formidable number. This may be related to the frequency with which children had to be referred to the ENT clinic (Table I), which was the largest of the special clinics, although no child was seen there who had not been referred by a doctor, usually after preliminary treatment had failed. The frequency of deficiency diseases, mostly rickets, may also have an

aetiological association with the respiratory complaints (Table III).

#### Less Common Illnesses

In a teaching hospital there never seems to be any shortage of the most gross forms of neurological illness, cardiac disease, and renal cases. A check on the incidence of these showed that the numbers were quite small when contrasted with alimentary and respiratory illnesses. There were even fewer cases of a haematological nature, though it should be made clear that gross anaemia was extremely common in association with many other diseases. The only surgical condition on which particular interest was focussed, largely because of the very large number of bed-days which its inpatient treatment requires, was 'burns'. The total was surprisingly small—370. No attempt could be made to divide this into degrees of severity.

#### Aetiology

In an attempt to clarify the background of this very large incidence of sick children, the census asked for an opinion about the aetiology of each child's presenting illness, and an estimate of its severity (Table III). It is almost needless to say that infection was the commonest cause, and that most of these patients were acutely ill. Fortunately, 60% of the infections were of moderate

TABLE III. HOSPITAL SURVEY, 1960—TYPES OF ILLNESS, DEGREE AND ORIGIN

Illness	No. of patients	Acute	Trivial	Congenital
Infection .. ..	13,993	12,159	2,597	—
Trauma .. ..	2,496	2,439	1,221	8
Structural .. ..	1,438	205	313	993
Functional .. ..	844	393	333	89
Deficiency .. ..	727	220	55	27
Infestation .. ..	363	174	100	—
Poison .. ..	99	98	20	—
Allergy .. ..	98	53	24	4
Neoplastic .. ..	44	14	6	7
? .. ..	315	—	—	—
Total .. ..	20,417	15,755	4,669	1,128

severity, only 20% were severe, and 20% were regarded as trivial. The second commonest cause of attendance was trauma, of which almost half was of minor character and only 5% severe. Structural lesions, mostly some form of congenital abnormality, came third on the list, but accounted for a quite small proportion of the total. A surprisingly high proportion of these children were acutely ill.

Functional\* complaints were unexpectedly common. These included conditions such as enuresis, speech defects, tics, and behaviour problems; only 14% of them were considered to be severe. Deficiency diseases, mainly rickets, were not rare, but in view of the prevailing social and economic state of a large proportion of the children, were not beyond expectation. Allergy was very seldom thought to be a cause of trouble.

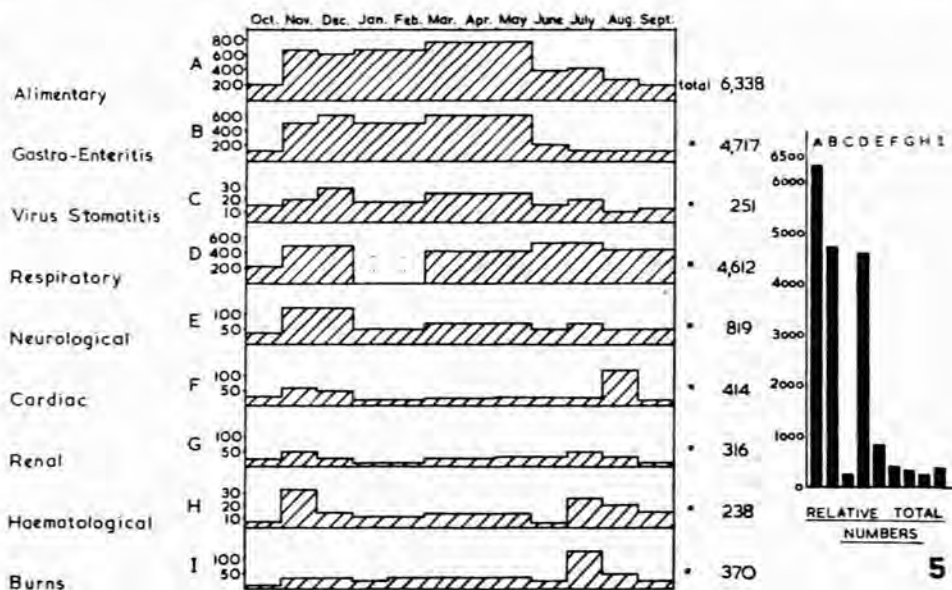


Fig. 5. Seasonal variation of selected diseases seen in children attending the outpatient department, during the year covered by this survey.

Of the causes of illness which should be totally avoidable, infestation (mainly by intestinal parasites) and poisoning were common. The poisoning cases were mostly of severe or moderate degree, as might be expected, since the children would not otherwise have been brought to hospital.

Frankly neoplastic disease was very rare, 44 cases in a year. This was listed for special enquiry because of some of the fearsome statistics published in recent years concerning the role of such illnesses in the mortality of childhood. The majority of the children (38 out of the 44) were classed as having a severe or moderate degree of illness, and 14 were acutely ill.

The enquiry was also aimed at the real need for hospital attention. As shown in Table III, only 4,669 out of 20,000 children were considered to have a trivial degree of illness, and over 15,000 were classed as acutely ill. The total number thought to have a disease of congenital origin is not improbable—approximately 5%—but accounts for a very small proportion of the patients. The work involved in correction of the abnormalities is another problem, which we did not attempt to solve.

#### DISCUSSION

From these data it would appear justifiable to make certain deductions. Primarily, it is evident that a general children's hospital must be prepared to deal with very large numbers of very small children. More than half

of its patients will be under 2 years of age, and over 40% will be less than 1 year old. The significance of this observation is far-reaching. The whole hospital, both in respect of its inpatient and outpatient facilities, must be laid out to cater primarily for the needs of infants. This applies not only to the structure, but also to the nursing staff. The care of the very young is a specially skilled job and the requisite training to supply a staff in numbers sufficient for the proper care of such children does not at present exist. This calls for urgent attention.

The time-honoured custom of splitting the hospital 'down the middle' also needs revision. This applies not only to the separation of the ethnic groups but, to a comparable degree, to the allocation of medical and surgical beds. There is probably not much difference between the average time of stay in hospital of medical and surgical patients in this paediatric age group. The surgical patient should be in need of inpatient care for a shorter time than his medical counterpart. There are about 70% medical, to 30% surgical, demands on the hospital's services, and the beds on both sides are under heavy pressure. But, for some extraordinary reason, it has been the custom to assume that a child suffering from a medical illness can justifiably be sent home if a bed cannot be found for him while that can seldom be permissible with a surgical illness. The figures supply their own comment. In particular, the incidence of diarrhoeal disease and the gravity of the illness, as reflected in the number of administrations of parenteral fluid required, in themselves constitute a demand for fresh thought. Any infant which needs intravenous fluid really should be admitted for treatment. For lack of the necessary facilities it has to be given something less than is desirable and this in turn calls for activity in the outpatients' resuscitation room night and day almost every day of the year. The number of such children who succumb to their illness for lack of adequate medical bed facilities is problematical, but cannot be small.

Two-thirds of the children in this series were suffering from infection. There are a number of angles from which that statement can be considered. It shows the deplorably low standard of hygiene of the community at large. There is desperate need of action to educate the mothers in the care of very young children and of facilities by the use of which a large proportion of these illnesses might be dealt with in the early stages. Peripheral centres of some kind would meet that need and almost certainly diminish the present increasing requirement for more hospitals, for which staff—both medical and nursing—is becoming rapidly less available. Relatively little and relatively inexpensive early treatment would be incomparably better and easier than mass therapy when these infections have already reached dangerous proportions. There is a limit to what the staff of a central hospital can deal with and sheer weight of numbers makes their job well-nigh impossible.

The situation with regard to malnutrition also speaks for itself. The suspicion that a severe degree of sub-normality exists has been shown to be true. The round figure of 10% applies, of course, only to the children who were seen at the hospital and cannot be applied to the population as a whole, but there are several thought-

provoking features discernible. Why did the attendance figures for children under 1 year of age fall so rapidly? Why was there an even more precipitate fall in the 6-monthly totals between 6 months of age and 2½ years? Was one visit to hospital, or a few, so beneficial that the numbers fell from 4,500 to 800 between these two ages, or do a large proportion of the younger children not survive the hazards of infancy and early childhood? There is nothing reassuring about the statistics when the school population is scrutinized. Or is the hospital, in fact, succeeding in educating a large proportion of the mothers in the proper care of their families so that the health of the children benefits? The finding of frank kwashiorkor at the age of 11½ and 12 years, taken together with the iceberg simile, throws grave doubt on this idea. It is true that many of these patients with malnutrition would not have been seen had they not also had concomitant acute illness. This only suggests that matters are worse than has been shown, and that many cases of malnutrition are not known simply because there has not been any precipitating reason for hospital care to be thought necessary. However one looks at it, the nutritional situation is far short of what is desirable.

The facts shown in this survey deserve the earnest consideration of the various people who are, in some way, associated with the planning, building, staffing, equipping and administration of all children's hospitals. They have been known, in a general way, to paediatricians for a very long time, but carefully accumulated figures on which to work are, understandably, rare. It is to be hoped that this series will be found to be helpful in the schemes for the future.

#### SUMMARY

Some general statistics for the children attending at a general children's hospital are considered. These cover a period of 1 year.

The incidence of malnutrition, below a certain standard of body weight, and of kwashiorkor, was shown to be 8-10% and about 1% respectively in the non-White groups. A considerable majority of the children were in need of medical, as opposed to surgical, attention. Analysis of the age distribution showed that 41.8% of the children were under 1 year, and 57% under 2 years. The overwhelming majority of the illnesses were of infective origin, congenital conditions accounted for only 5%, and neoplastic disease was extremely uncommon.

The bearing of these observations on the design of medical services is briefly discussed.

We are indebted to Dr. J. F. W. Mostert, the Medical Superintendent, for permission to make use of the Red Cross War Memorial Children's Hospital for children's facilities, to the admission-desk staff for their helpful cooperation; to the Hollerith Department of the Provincial Administration for the sorting of the data; to Mr. J. Fordyce for assembling the figures and to the University Research Committee for financial assistance. Without the cooperation of the entire medical and surgical staff the figures could not have been obtained.

#### REFERENCES

1. Lurie, G. M. and Ford, F. J. (1958): *S. Afr. Med. J.*, **32**, 1017.
2. Woodrow, E. P. and Robertson, I. (1950): *Ibid.*, **24**, 761.
3. Robertson, I. (1961): *Ibid.*, **35**, 466.