TABLE I.—Results of Treatment

Case No.	Diagnosis	Total Dose of Actinomycin C	Therapeutic Effect	Toxic Effects	Follow-up	
					Period	Results
1	Hodgkin's disease	4,600 µg.	None	None	—	Died during treatment
2	" "	4 courses (5,000 µg., 8,000 µg., 5,000 µg., and 4,000 µg.) (biweekly doses)	Slight	Stomatitis; thrombocytopenia; pigmentation	6 months	Died
3	" "	5,400 µg.	"	Hair loss; stomatitis; thrombocytopenia; rash; leucopenia	8 "	Some improvement maintained
4	" "	9,100 "	None	None	6 "	Further deep x-ray required
5	Reticulum-celled sarcoma	7,000 "	Marked	"	3 "	Marked improvement maintained
6	Hodgkin's disease	4,500 "	None	Stomatitis; pigmentation	—	Died during treatment
7	" "	7,500 "	Marked	Rash	3 weeks	—

size of lymph nodes and spleen. In one of these patients improvement has been maintained up to the present, a period of three months. Two other patients showed slight improvement, with some reduction in the size of lymphatic glands and temporary disappearance of fever. Three cases showed no response to the drug; but two of these patients died of their disease before completing the course of treatment, and therefore did not really afford an adequate trial for the drug. Where improvement occurred it was slow, and reduction of fever appeared only after a week or more.

Toxic Effects.—(a) *Thrombocytopenia*: The most serious side-effect noticed was thrombocytopenia. This occurred in two patients; the details are summarized in Table II. In Case 2 a retroperitoneal haemorrhage required laparotomy

TABLE II.—Cases in Which Thrombocytopenia Occurred

Case No.	Platelet Count before Treatment	Total Dose of Actinomycin C	Lowest Platelet Count	Platelet Count after 1 Week on Cortisone
2	200,000	5,000 + 8,000 µg.	10,000	30,000 (80,000 after 1 month)
3	130,000	5,400 µg.	42,000	100,000

and transfusion. In both patients the actinomycin C was stopped, and they appeared to respond to cortisone, 150 mg. daily; and in Case 2 further administration of actinomycin C combined with cortisone did not lead to a recurrence. Although thrombocytopenia may occur during the course of Hodgkin's disease (Gledhill and Shillitoe, 1952), it seems very much more likely that in these two patients it was associated with the actinomycin C—suggesting that, if the drug is given, a careful check should be kept on the platelets. (b) *Other Side-Effects*: The other side-effects noticed were sore mouth (three patients), erythematous rash (two patients), brown pigmentation of the skin (two patients), slight loss of hair (one patient), and moderate leucopenia (one patient).

Discussion

The results in this small series suggest that, in advanced reticulososes, actinomycin C only occasionally has any great effect on the disease. Its place in the treatment of this group of conditions is difficult to assess at present, but it would seem to be worthy of a trial when the other more usual treatments have failed, and particularly in those patients who for one reason or another are unable to take nitrogen mustard.

The other possible use for the drug might be in combination with either deep x rays or nitrogen mustard in an attempt not only to increase the therapeutic effect but perhaps to prevent the appearance of resistance to further treatment at a later date in those patients who respond satisfactorily, or to increase the sensitivity to radiation of those cases that have become radio-resistant.

Summary

Six cases of Hodgkin's disease and one of reticulum-celled sarcoma have been treated with actinomycin C.

In two patients there was marked regression of the disease, and in two slight regression.

The side-effects of the drug included stomatitis and thrombocytopenia. The importance of repeated examination of the blood during treatment is stressed.

We would like to thank Dr. D. I. Finer, the family doctor of one of the patients, for his co-operation, and Dr. Wilpert, of Farbenfabriken Bayer, for the supplies of sanamycin.

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ALBUMINURIA IN SERVICE RECRUITS

BY

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The time is long past when albuminuria was regarded as synonymous with renal disease; benign albuminuria is a well-recognized condition. When albuminuria is found in a recruit who, apart from this, appears to be quite fit for service, the possibility of the albuminuria being benign calls for consideration, and before reaching a decision on this point the chairman of the medical board concerned may refer the recruit for examination by a pathologist. In addition to albuminuria there may be features in the past history of the apparently healthy recruit—"kidney disease," scarlet fever, etc.—which suggest the possibility of a legacy of latent nephritis, and so reinforce the advisability for as full an examination as possible before a final decision is reached concerning the suitability of the recruit for service. The same considerations of course arise with respect to examinations for insurance, and sometimes for employment. I have been dealing with cases referred for pathological examination since 1940. The examinations were planned at short notice, to give the medical boards the information asked for, with no thought of publication at the time, but I believe the results obtained to be of sufficient interest to be placed on record.

Method

Recruits for examination are instructed to have only a light breakfast, with not more than one cup of weak tea (coffee is forbidden), and they are asked to present themselves at 10 a.m. On arrival they are immediately instructed to empty the bladder, and the urine is kept for examination.

They are then given 15 g. of urea dissolved in half a tumblerful of water, and seated in a comfortable chair, at a desk on which are magazines and newspapers. At the end of an hour they are instructed to empty the bladder again, a sample of blood is taken after a further half-hour, and the bladder is again emptied two hours after taking the urea. All urine specimens are tested for albumin, and their volume and urea concentration are determined. The first specimen is centrifuged and the deposit examined microscopically. The same procedure is sometimes carried out on the other two specimens also. The urea concentration of the blood specimen is determined and the urea clearance calculated from the data from this specimen and the third specimen of urine. The results obtained are tabulated as in Chart 1.

Name:—John, E. J.		Registration No.:—SRB 9958			
Board No.:—1		Referred for :—Albuminuria			
Urea Clearance Test					
Urine	Albumin	Time	Volume	Volume/Min.	% Urea
Before urea . . .	+		54 ml.		1.36
1st specimen after . .	Trace	55 min.	154 "		1.57
2nd " " "	Nil	57 "	70 "	1.22 ml.	3.03
Deposit: A few leucocytes.					
Blood:—Urea during 2nd hour after urea: 57.1 mg./100 ml.					
Rate of urea clearance: 109%.					

CHART 1.—Specimen result sheet, showing considerable range of urea concentration.

It is many years since the practice of determining the urea clearance after giving urea in the way just described was first advocated. It is still not generally accepted, however, and I believe it worth while stating what I believe to be its very great advantages. Firstly, the institution of hourly emptying the bladder before the second-hour period (on which the clearance value is calculated) results in more satisfactory emptying at the beginning and end of this period than when no preparation for urine collection before the clearance period is made, and this makes for greater accuracy in the determination of the clearance rate. But much more important is the fact that the data obtained in the way referred to give a much better overall picture of renal function than when no urea is given.

Following the ingestion of 15 g. of urea, the blood urea quickly rises, and within an hour exceeds the original concentration by 25–30 mg. per 100 ml. in the average adult, and it remains approximately constant at this higher level throughout the second hour afterwards. The first specimen of urine is secreted with the blood urea at the original level; the second one is secreted during the period while the blood urea concentration is rising, and has an average concentration for the period of 12–18 mg. per 100 ml. higher than at the starting-point; while the third specimen is secreted while the blood urea concentration is 25–30 mg. per 100 ml. above the starting-point. The three specimens of urine taken during the test are therefore taken under different conditions so far as the important factor of blood urea concentration is concerned.

Now, efficient kidneys respond readily to changing conditions, while loss of efficiency shows itself by loss of ready adaptability and a tendency to work at a dead level. This is reflected in the volumes and urea concentrations of the three urine specimens. When renal efficiency is high there is usually a considerable range of urea concentration to be seen among the three urines (Chart 1), whereas when efficiency is low the range is much smaller and sometimes the three concentrations are practically identical (Chart 2). Volumes show similar ranges, but the figures are not so precise as those for urea concentration. The period of secretion represented by the specimen passed on arrival is not usually known with anything approaching accuracy. If it is long, there may have been some overdistension of the bladder, so that it may not empty itself completely when urine is passed, and a portion is retained and is later passed along with the urine secreted during the first hour after urea, so that this specimen may be somewhat larger than it should be. If the first period referred to is very short the

Name:—Jack L. Board No.:—3.		Registration No.:—YCK 255 Referred for :—Albuminuria			
Urea Clearance Test					
Urine	Albumin	Time	Volume	Volume/Min.	% Urea
Before urea . . .	+		225 ml.		1.69
1st specimen after . .	Weak+	49 min.	103 ml.		1.80
2nd " " "	Weak+	60 "	92 "	1.53 ml.	1.99
Deposit: Many granular and a few hyaline casts; a few red cells, some leucocytes.					
Blood:—Urea during 2nd hour after urea: 108.8 mg./100 ml.					
Rate of urea clearance: 42%.					

CHART 2.—Specimen result sheet showing almost identical urea concentration.

stimulus for the bladder to empty completely may be inadequate. Effects of this kind, however, have usually corrected themselves by the end of the first hour, so that the second-hour specimen correctly represents the urine secretion over this period.

A consideration of the range of urea concentrations and to a less extent of the volumes of the urine specimens is particularly useful in cases where the value for urea clearance is a borderline figure. If the range is limited it is very probable that renal function is impaired, whereas, with a good range, renal function is probably satisfactory, even though the figure for urea clearance may be slightly below the normal range. In general, assessment of renal function should be made by a consideration of all the figures obtained, and not simply from the clearance rate.

Inspection of volume and urea concentration figures may also be of value in another way. Since the blood urea concentration is higher during the secretion of the second-hour specimen than during the secretion of the first-hour specimen, the former specimen should be greater in volume or urea concentration, or both, than the latter. If in any test this is not found to be the case, incomplete emptying of the bladder must have taken place at some stage, and the clearance figure calculated from the observed values may be erroneous. In such cases it is advisable to have the test repeated, paying particular care that the instructions to the patient, to empty the bladder completely each time a urine specimen is passed, are thoroughly understood.

In the work on recruits I have never found a result of the type just described, but among cases dealt with in hospital such results do arise from time to time. This is no doubt partly due to failure of the patient to appreciate the need for complete emptying of the bladder in some cases, but also partly due to the fact that the persons dealt with in hospital represent a much more heterogeneous group than Service recruits, and contain a proportion of older people, among whom are some who do not easily achieve complete emptying of the bladder.

The test, when carried out in the manner described, throws light on still another point—the relation of albuminuria to posture. The first specimen of urine is passed immediately following a period of activity in the erect posture. (The recruit has some little distance to walk to the laboratory, and finally climbs two flights of stairs.) The remaining specimens are passed after periods during which he is comfortably seated. I have found that this change from erect posture to sitting has the effect of completely abolishing albuminuria in a large number of cases—that is, it has the same effect as the change from standing to lying down, and so serves to distinguish certain cases in which the albuminuria is of the so-called orthostatic variety. Watson (1951) has also advocated tests, after keeping patients sitting for a period, for the diagnosis of orthostatic albuminuria.

The significance of an albuminuria is mainly decided from the nature of the centrifuged deposit. If this differs in any way from what is known to be normal the case is not accepted as benign. It is only rarely that a knowledge of the urea clearance rate is of great importance in this connexion. A normal clearance rate certainly does not exclude the presence of renal disease; in many mild cases of both acute and chronic nephritis, renal function appears to be unimpaired. Where it is impaired there will be few cases

that do not also indicate the presence of renal disease by the nature of the urinary deposit, and some of them will have signs and symptoms obvious enough to the examiners of the medical boards to prevent these cases being considered as apparently fit, apart from their albuminuria. There are a few cases of chronic nephritis, however, in which albuminuria is slight, and in the deposit signs of renal disease are often scanty and occasionally absent. If one depended solely on the findings in the urinary deposit, the true nature of the albuminuria might be missed. Such cases, however, will almost always show a reduced clearance rate, and a restricted range of urea concentration in the urine specimens.

It is generally accepted that orthostatic albuminuria is benign. Nephritic albuminuria may also be effected by posture, but though rest often diminishes it, rest seldom abolishes it entirely, and there will usually be other evidence pointing to the true nature of the condition. The diagnosis of benign albuminuria that is not orthostatic is by exclusion, and I have throughout acted on the principle that an albuminuria can be considered as probably benign only if all other findings are reassuring.

To expect examination on a single occasion to indicate the true nature of an albuminuria in every case is to expect the impossible. Nevertheless, I believe a single examination on the lines I have indicated is adequate in the great majority of cases. Grading, of course, is the business of the board, not of the consultant, but the board looks to the consultant for more than a bare statement of his findings. Wherever possible I have given my opinion of the nature of an albuminuria I have investigated. In some cases I have asked for re-examination after a period—usually six months—and in the majority of such cases the board has deferred a decision and sent the recruit for re-examination as requested. In a few cases I have felt bound to confine myself to a statement of the findings—for example, that, apart from the albuminuria, I have found no clear evidence of renal disease or of impairment of renal function.

Results

The table below shows the results obtained on 200 male recruits; a few female recruits have also been examined, but on account of the smallness of their numbers they have not been included.

The ages of the 200 cases included in the list are as follows: below 18 years, 20; 18, 115; 19–22, 37; 23–30, 11; over 30, 8; age not recorded, 9.

The results have been grouped according to the reason for which the examination was requested by the board, having regard to the history as well as to the findings at the board examination. The subgroups (see Table) indicate the findings of the laboratory examinations. Some of the subgroups are considered in greater detail in the Discussion.

Discussion

Subgroup 1a—Benign Albuminuria

This is one of the most interesting groups. Views on the influence of posture vary, for while some claim that all benign albuminurias are orthostatic, others admit that in a proportion of cases posture has no great influence. Obviously if one holds the former view, clear relation of the occurrence of albuminuria with the assumption of the erect posture will be a cardinal point in the diagnosis. Another requirement according to some writers—for example, Tidy (1949)—is absence of any history of renal disease. This seems to me to be an unreasonable requirement. Complete recovery from acute glomerulonephritis occurs in about 85% of cases; benign albuminuria is by no means uncommon. Hence certain cases with benign albuminuria must be among those who contract acute nephritis and recover completely. Admittedly an albuminuria associated with a history of nephritis must cause one to think of the possibility of a latent nephritis, but where all findings except the presence of albumin are negative, and the albuminuria

Table of Subgroups

1. Albuminuria only:		
(a) Benign		92
(i) Orthostatic—complete type		42
(ii) "incomplete type		19
(iii) Not orthostatic		26
(iv) No albumin found		4
(v) Spermatorrhoea		1
(b) Doubtful		5
(c) Not benign		36
(i) Evidence of nephritis, normal clearance		19
(ii) "reduced clearance		13
(iii) "infection of lower urinary tract		4
2. History of Nephritis		
(a) No albuminuria		13
(i) All other findings normal		12
(ii) Some casts still present		1
(b) Albuminuria present		23
(i) Albuminuria orthostatic, other findings normal		6
(ii) "not orthostatic, other findings normal		5
(iii) "clearance normal,		
deposit positive		5
(iv) Albuminuria not orthostatic, reduced clearance		7
3. Albuminuria and Raised Blood Pressure		9
(i) Albuminuria orthostatic, other findings normal		3
(ii) "not orthostatic, other findings normal		1
(iii) "normal clearance,		
deposit positive		2
(iv) Albuminuria not orthostatic, reduced clearance		2
(v) Probably pyelo-nephritis		1
4. Albuminuria and History of Scarlet Fever		9
(i) Albuminuria orthostatic, other findings normal		2
(ii) "not orthostatic, other findings normal		3
(iii) "normal clearance,		
deposit positive		4
5. Albuminuria and History of Other Infections		5
(i) Albuminuria orthostatic, other findings normal		1
(ii) "not orthostatic, normal clearance,		
deposit positive		4
6. History of Nephrectomy		4
(a) No albuminuria, other findings normal		3
(b) Albumin present, not orthostatic, reduced clearance		1
7. Albuminuria and or Other Conditions		2
(a) Albuminuria and anaemia		1
(b) "cystinuria		1
8. Previously Graded IV Elsewhere		
Albumin not orthostatic, other findings normal		2
Total cases considered benign		118
"as doubtful		200
"to show evidence of nephritis or other disease		15
of the urinary tract		67

is clearly orthostatic, I believe it justifiable to regard the albuminuria as benign. Where the albuminuria is not orthostatic it may still be benign, but the possibility of its being evidence of latent nephritis is greater, and is such as to justify a cautious attitude to those cases.

There is also the possibility that a benign albuminuria may be a residue of a healed nephritis. King (1955), in a study published as this paper was nearing completion, states that orthostatic albuminuria occasionally follows as a residue of otherwise apparently healed glomerulitis (healed, with defect). I have myself occasionally discovered an orthostatic albuminuria in a case giving a history of nephritis, but have not been sufficiently satisfied that the albuminuria was not present before the nephritis appeared to be certain of the relationship between the two conditions.

Another finding which Tidy considered to be inconsistent with benign albuminuria is a rise in blood pressure. With this one must agree, provided it is established that there is a rise in blood pressure. But a high reading as a result of a single test, as is often the case in routine medical examinations, is of doubtful significance, and the claim that the blood pressure is raised should be confirmed before it is allowed to influence one's view of a case unfavourably.

So far as the test for orthostatic albuminuria is concerned it is striking to see how rapid, in many cases, is the change brought about by rest in a sitting position. In 30 cases the urine after one hour's rest was entirely free from albumin, though it was present, often in quite high concentration, in the specimen passed immediately before. In 12 others the albumin had fallen to a trace after the first hour's rest, but had disappeared after a further hour.

In some cases, however, there was still a barely detectable trace after two hours.

Watson examined 62 cases of albuminuria by a similar method, testing urine after 15, 30, 45, and 60 minutes in the sitting posture. There were four "failures": one man still had albumin after 60 minutes' rest, but produced a clear specimen after a night in bed; the other three could not be rested for a full hour, but produced clear specimens after a night in bed. Watson found that the shortest rest period to produce a clear urine was 25 minutes.

It may well be that the sitting posture maintained even for two hours is not quite as efficient in abolishing albuminuria as rest in bed. It will be noted that there are 19 cases in which albumin did not entirely disappear during the test; these are referred to as the incomplete type. The results on the three urine specimens are recorded as +, trace, trace, or ++, trace, trace. All had to rise from their seat and go into an adjoining room to pass the specimens, thus on each occasion assuming the erect posture for a few minutes, and it is possible that they are sufficiently sensitive to it to cause enough albumin to pass into the urine to account for the trace shown in the test. In many cases this appeared only after adding acetic acid—that is, the "albumin" found was the "acetic acid body" referred to by Fishberg (1939), Müller and Seifert (1942), and others.

There remain 26 cases in which change to the sitting posture either has little effect on the albuminuria or has an effect which, though appreciable, is not sufficient to abolish it or to reduce it to a trace only. These are the cases which, on the basis of the test used, cannot be regarded as orthostatic. They are less than half as many as the cases included as orthostatic. It is certainly possible that some of these might respond to a night's rest in bed, but I think their number would be small.

The proportion of cases which are not orthostatic is not correctly represented by the figures I have obtained. When albuminuria is found in a recruit who otherwise appears to be healthy, he is asked by the board to attend a day or two later, bringing an early morning specimen of urine with him. If this is free from albumin it is assumed that his albuminuria is orthostatic, and usually he is not referred to me for further examination. Hence the number of cases of orthostatic albuminuria which have appeared at the board is probably much greater than those I have dealt with, and the proportion of non-orthostatic cases correspondingly less. It is evident that many recruits have not clearly appreciated that an early morning specimen for this purpose means a specimen passed immediately on rising and before any appreciable time in the erect posture has elapsed, for most of those whom I have found to have orthostatic albuminuria had produced an "early morning" specimen which contained albumin. In two cases in this subgroup I was unable to find albuminuria, though it had been found by the board. These are presumably cases with irregular and intermittent albuminuria, and may be included among those considered to be benign.

Two other points were noticed in the cases with benign albuminuria. One is that the acetic acid body is present in a large proportion of cases. In some it appears to be the only protein present—that is, no cloudiness appears on boiling the urine alone, but appears immediately a drop or two of 33% acetic acid is added. The other point is that a high proportion of the recruits faint or almost faint after the blood specimen is taken. This is in agreement with the statement of Fishberg that many patients with benign albuminuria have striking vasomotor instability. King also noted that in such cases pallor, sweating, and syncope are frequent after simple procedures.

Subgroup 1b—Doubtful

These cases had albumin in all three urine specimens. In addition three cases had some red cells and two had a few casts in the deposit. One had a clearance rate slightly below the normal range.

The presence of both red cells and casts is not necessarily abnormal. Addis (1925), for example, gives the normal number of red cells as 0–425,000, with an average of 65,750, in 12 hours, and of casts as 0–4,270, with an average of 1,040. Other figures are quoted by Sunderman and Boerner (1949). In the five cases referred to, while the red cells and casts were not clearly outside normal limits, they were sufficiently numerous, in view of the persistent albuminuria, to give rise to doubt regarding the health of the kidneys.

Bull (1948), in a careful study of postural proteinuria, found that there was an increase in the output of all the formed elements in the urine in this condition, the rise being roughly proportional to the amount of albumin present. The impression I have gained from the examination of recruits confirms this finding.

Subgroup 1c—Not Benign

The cases in this group, which had a normal urea clearance, contain the largest number (6) that were examined more than once. Signs of renal disease were relatively slight, renal function was quite satisfactory, and some admitted to having had a sore throat or "cold" recently. It was felt, therefore, that they might be cases of mild subclinical glomerulonephritis following recent infection, which might be in the healing stage and might therefore show evidence of recovery in a few months.

Two, on re-examination, showed only an orthostatic albuminuria; all signs of nephritis had disappeared. One showed a persistent albuminuria, other findings being normal, and the remaining three still showed signs of renal disease in the urine deposit.

Three other cases in this group were thought to be possible cases of mild nephritis in the healing stage, but were not sent for re-examination. Of the remaining 10, some showed signs pointing to a chronic lesion—for example, a tendency to fixity of urine urea concentration. The urea clearance in cases which showed this to be reduced was between 21% and 62%.

In all, 32 cases appearing healthy on clinical examination showed some evidence of nephritis, though no history pointing to this condition, or of an infection which might be responsible for this condition, was given to the board. In a few cases I obtained some evidence of infection by questioning during my laboratory examination, but in the majority of cases no relevant history could be obtained. The absence of any history of oedema and the presence in most cases of slight haematuria place these cases in Type I of Ellis's classification. Ellis (1942) found no history of previous infection in 16% of the cases of this type which he examined.

The results of these examinations appear to show that a subclinical nephritis may follow a commonplace infection which is not long remembered, but that in spite of the mildness of the infection and the inconspicuous nature of the sequelae the nephritis may progress to the chronic state.

One case had much pus in the urine with no other abnormal signs, and a high urine urea concentration. Gonorrhoea seemed a likely explanation of the findings, and, on questioning, the recruit admitted that he had had a urethral discharge and had been exposed to the risk of venereal infection. My colleague Dr. Williamson confirmed the presence of gonococci in this urine. This case well illustrates the value of carrying out the examination while the recruit is available for questioning, or, if necessary, additional examination, prompted by the findings in the early part of the examination. I have on a number of occasions obtained valuable information from the recruit that had not been made available to the board.

Three other cases had pus with some blood but no casts, and a normal urea clearance, and so were probably cases of lower urinary tract infection, but no evidence of a specific nature was obtained.

Group 2—History of Nephritis

The figures here illustrate well-known facts. Of 36 cases, 12 show complete recovery, with absence of albuminuria; 6 show only orthostatic albuminuria, and in my view should also be considered to have recovered; and 13 still show signs of nephritis, though it is possible that where the history is recent complete recovery may ultimately occur in some cases.

It is probably best, in view of the history, to regard as cases of latent nephritis the 5 with normal findings except for an albuminuria that is not orthostatic, though to those who accept the view that benign albuminuria is not always orthostatic they may be cases which have recovered completely from their nephritis.

Remaining Groups

The number of cases in each of the remaining groups is small and the results call for little comment.

Taking all groups together, the number of cases that can be accepted as being free from renal disease is 118; 18 must be regarded as doubtful; and the remaining 64 show definite signs of renal disease. Thus, approximately 60% of cases referred for the reasons indicated in the table can be accepted as fit for service.

Summary

The examination of recruits who are apparently healthy apart from the presence of albuminuria is described, and the results of such examination in 200 male recruits are given.

The findings in different groups are discussed, and attention is drawn to cases in which it appears that chronic nephritis was the sequel to a subclinical glomerulonephritis following a commonplace infection that is often soon forgotten.

In approximately 60% of the recruits examined the albuminuria could, with reasonable confidence, be taken as benign and the recruits accepted for service.

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In his Annual Report for 1954 Dr. A. ELLIOTT, county medical officer of health for Kent, describes a pilot scheme, undertaken as part of the domestic-help service, for the provision of evening and night attendants for elderly people in the Maidstone and Medway towns area. The attendants' duties include provision of meals, preparations for sleep, attention to fires, and night attendance. The scheme is limited to cases where voluntary help cannot be provided, and the assistance provided may be either continuous or intermittent, depending on available help from relatives or other sources. The scheme was brought into operation on November 1, 1954, and by the end of that year 37 applications had been received, and in 30 of these cases the necessary help was provided by the county council. There has been an appreciable increase in the demand for this service since the end of last year, and it has been decided to continue this pilot scheme for a further period of six months.

STAPHYLOCOCCAL PNEUMONIA IN INFANCY

BY

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Staphylococcal pneumonia in childhood, with its tendency to abscess, empyema, pneumothorax, and cyst formation, has been recognized for many years, but until recently has been regarded as a comparatively rare disease. This is indicated by the small numbers reported in the literature. For example, the largest series, excluding the post-mortem material of Guthrie and Montgomery (1947), deals with 41 cases, and was collected in New York by Kanof *et al.* (1953) from the early sulphonamide era to 1952, a period of more than 10 years.

In contrast to this we have seen as many as 55 cases in a period of 29 months. All our cases were observed at a time when the broad-spectrum antibiotics were freely available, and because of this we wish to discuss some of the problems that arise in the management of the disease at the present time.

Kanof *et al.* (1939) emphasized the frequency of empyema, which occurred in 78%, and stressed the serious nature of the disease, the mortality being 70%. Chaplin (1947), in a review of empyemata in children, noted that the staphylococcus was almost invariably the cause in infants under the age of 6 months. Blumenthal and Neuhof (1946), describing 40 patients, most of whom were treated before the advent of penicillin, drew attention to the importance of surgical measures in lowering the mortality, only 13 (33%) of their cases being fatal. They attributed their good results to the early institution of closed drainage in cases of empyema and pyopneumothorax and deplored the use of repeated aspirations.

With the introduction of penicillin the mortality fell (Chaplin, 1947), but the development of penicillin-resistant strains of staphylococci soon diminished the value of this drug. The discovery of the broad-spectrum antibiotics provided a new weapon, and the results of Kanof *et al.* (1953) suggested that the problem of staphylococcal pneumonia was largely solved. These authors reported 12 consecutive cures with chlortetracycline ("aureomycin") and penicillin, and considered that the need for aspiration of empyemata was almost abolished. This is not our experience.

Cysts have been recognized as a common complication of this condition, but they usually subside without treatment. Potts and Riker (1950) pointed out the importance of distinguishing them from congenital cysts, as these, in contrast, often require major surgery.