It is felt that in the type of case described antero-lateral chordotomy gives the best results. The mechanism of pain production and its relief by the various treatments is discussed.

Mr. Anthony James and Dr. D. Macdonald Wilson, both of New Zealand, have given me much assistance in following up my patients. I am also grateful to Professor J. C. Eccles and to Dr. T. McLardy for helpful discussions regarding the mechanism of phantom-limb pain.

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The annual report on the medical services of Nigeria for 1950-1 contains an account of a scheme to eradicate mosquitoes at Ilaro in Southern Nigeria. The scheme was based on the suggestions of the Expert Committee on Malaria of the World Health Organization, and the preliminary malaria survey began in 1949. Ilaro has some 12,000 inhabitants and 2,300 houses, and is a typical mixed urban and rural community situated within a geographical zone where hyperendemic malarial conditions exist. *P. falciparum* is the main parasite species but there is also *P. malariae*. *A. gambiae* and *A. funestus* are the main vectors, with *A. funestus* persisting throughout the year, while *A. gambiae* has a pronounced seasonal importance during the rains. Residual spraying began in March, 1950. The insecticide used was the benzene hexachloride wettable powder "P.520," containing 6.5% of the gamma isomer. The spraying of the 2,300 houses, containing over 11,000 rooms, is being repeated every three months and the results are now being assessed by the study of entomological and malarimetric data. According to the report it is still too early to assess the results of this scheme, which must last for three full years before any valid information is obtained. Nevertheless the preliminary results have shown that there has been a spectacular decrease of adults of *A. funestus*. The decrease of malarimetric indices in the local population has been slow, but this was not unexpected in an area previously "saturated" with malaria. The most pronounced reduction of the parasite rate occurred during the last half of 1950 in very young children. There was also a considerable reduction of malaria morbidity recorded at the Ilaro dispensary. The scheme is costing about £3,000 per year, or approximately 5s. per head of the local population.

DETECTION OF TUBERCULOSIS IN GENERAL PRACTICE BY PHOTOFLUOROGRAPHY

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Stradling (1948) has shown that the average apparent diagnostic delay in cases of pulmonary tuberculosis referred to his chest clinic at Hammersmith amounted to six months. Procrastination for two months occurred before the patient sought medical advice. The general practitioner waited an average of four months before he referred the patient to the clinic for special chest investigation. For years Toussaint (1946) and others have stressed that, if we are to find our cases earlier, minor respiratory and other symptoms in people who are not ill must be regarded as indications for a chest x-ray examination. Stradling lists the following symptoms or conditions based on Toussaint (1946) as indications for a chest x-ray film: cough, haemoptysis, dyspnoea, laryngitis, lassitude, bronchial catarrh, pneumonia, influenza out of season, recurring febrile chills, P.U.O., pleurisy, pleurodynia, or pain in chest, loss of weight, anorexia, anaemia and debility, amenorrhoea (unexplained), ischio-rectal abscess, erythema nodosum, phlyctenular conjunctivitis, contact.

X-ray Film Requirements

It was decided to ascertain the incidence of these symptoms, to which reflex dyspepsia was added, in a general practice of 3,500 in Wandsworth. In the single month of March, 1949, 155 patients of one of us (T. J. L.) complained of or presented with one or more of the above symptoms. Of the 155, 106 attended the surgery with these symptoms for the first time in March, 1949; 30 had previously attended with the same or allied symptoms in January or February, 1949; and 19 had come with the same or allied symptoms in October to December, 1948. All the 155 patients were referred for photofluorography. Had the scheme been in operation before March, 1949, presumably at least 49 of the 155 patients would already have been x-rayed. Later, over a period of two years, it was found that, using clinical judgment, about 20 films a month were required for the practice of 3,500. *This is just over five films a month per thousand patients* in the practice. The general practitioner ordering the x-ray examination had spent many years in general practice and had also had considerable experience of modern sanatorium treatment. This practice is probably representative of the area, and therefore a provisional estimate of the number of films required to be taken for general practitioners, using the indications previously mentioned, in a chest clinic area with a population of 200,000 would be 1,000 chest x-ray films a month, or 12,000 a year. Hunt (1951) stated that "during the last three years" 624 chests had been x-rayed—apparently in a practice of about 3,800. This gives an average of about 4.5 films per 1,000 patients a month, which is very similar to our figure of 5 per 1,000 a month.

Trenchard and Grenville-Mathers (1952) have said: "Instead of throwing the diagnostic net of the clinics ever

wider, a halt should be called when a chest clinic serving a population of about 200,000 is seeing up to 6,000 referred cases a year. This is probably as much as even a properly designed and equipped chest clinic can cope with." According to this authority, therefore, even a properly designed and equipped chest clinic could cope with only half the number of examinations which, according to our estimates, are needed. If we take the population covered by a single mass x-ray unit to be between half a million and one million, we can see that, by our estimate of a requirement of five examinations per 1,000 patients per month, the general practitioners serving this population will need (not necessarily demand) 2,500 to 5,000 chest x-ray examinations a month, or 30,000 to 60,000 a year. We conclude, therefore, that the present number of mass x-ray units available would be adequate to meet the needs of general practitioners for chest examinations only if they did nothing else.

A Scheme for South-west London

Facilities for unlimited miniature chest x-ray examinations are now offered to the general practitioners in South-west London, who were sent a letter which stated:

"You may frequently feel the need for access to special investigations without reference to a consultant or hospital. We are able to offer you a scheme whose purpose is to provide a chest x-ray for those people who are not ill, but who attend you with minor respiratory and other symptoms, which may indicate the need to exclude relatively early pulmonary tuberculosis.

"I should like to make it clear that the scheme is in no way intended to replace the service offered by a chest clinic. Ill or urgent cases and children under 15 years are quite unsuitable.

"*Diagnostic Value of 35 mm. Chest X-ray.*—It is a very reliable detector of pulmonary tuberculosis. Bronchiectasis, bronchitis, and some early cases of carcinoma of the bronchus may often be passed as 'N.A.D.', as may cases of dry pleurisy and some heart abnormalities."

The number of doctors now using the scheme is 252 (over 50% of the general practitioners in the area). In designing the scheme it was important to bear in mind the need to save the general practitioner time and trouble, including clerical work. This was achieved by providing instruction slips for the patient, who is required to telephone the mass x-ray service and negotiate an appointment to suit his convenience. From the accompanying x-ray request form it will be seen that the doctor has only to insert the symptom numbers for which he is referring the patient, and the onset. He gets the result by post the next day.

In 1951 3,720 patients living in the borough of Wandsworth (population 300,000) were x-rayed under this scheme. It might be thought that the availability of chest films to general practitioners through the mass x-ray unit would cause a falling-off in the numbers attending the chest clinics for the first time, but Table I shows that, on the contrary, the numbers attending the two chest clinics serving the area increased from 1,807 in 1950 (before the mass x-ray G.P. scheme was being considerably used) to 2,529 in 1951. Of 476 primary notifications of pulmonary tuberculosis made in Wandsworth in 1951, 7% were discovered through the ordinary mass radiography service, 11% through the mass x-ray G.P. scheme, and 82% through other channels.

It is of interest that the primary notifications for Wandsworth of pulmonary tuberculosis rose from 454 in 1950 (before the mass x-ray G.P. scheme was being widely used) to 476 in 1951. The total notifications for the London County, on the contrary, had fallen from 5,189 in 1950 to 4,897 in 1951. However, the Wandsworth rise was not

TABLE I.—Number Attending Chest Clinics for First Time

Year	Wandsworth Clinic	Balham Clinic	Total
1948	1,147	914	2,061
1949	946	890	1,836
1950	911	896	1,807
1951	1,138	1,391	2,529

the only one to occur in a London borough in this period, and the increase could be explained either as the effect of the new scheme or as a chance fluctuation.

Findings

We here describe the findings of the first 3,000 examinations made by the South-west London Mass X-ray Service for general practitioners. Table II shows that, of 3,032

TABLE II.—General-practitioner Scheme: Summary of Results

Disposal	No.	%
Referred to chest physician*	91	3.00
Referred to chest hospital†	18	0.59
Heart or other abnormality	140	4.62
N.A.D.	2,783	91.79
	3,032	100.00

* With lesions probably tuberculous. † With lesions probably non-tuberculous.

patients x-rayed 91 (3%) had radiologically significant lesions, probably tuberculous, requiring investigation. Of these, 60 were classified, after investigation, as active. This gives a rate of 20 active adult-type cases of pulmonary tuberculosis per 1,000 patients examined—that is 1 examinee in 50 had active adult-type pulmonary tuberculosis. (The decision whether to classify a patient as active or inactive was made by chest clinic physicians two months after he had been referred for investigation.)

Table III shows that the age-and-sex distribution of the 3,032 examinees differed from that of the general population; naturally, few very young and very old patients were submitted. Table IV shows surprisingly that in both sexes the symptoms were more often diagnosed radiologically as tuberculosis in the single than in the married people examined. This higher degree of radiological confirmation of suspicion in single examinees is best seen in the group of single women age 35–44, 15% of whom were found to have radiologically significant lesions, probably tuberculous and requiring investigation.

I HAVE REFERRED PATIENT FOR X-RAY COMPLAINING OF

Symptom Nos.	Onset

1. Cough.
2. Reflex dyspepsia.
3. Dyspnoea.
4. Laryngitis.
5. Lassitude.
6. Bronchial catarrh.
7. Influenza, out of season.
8. Recurring febrile chills.
9. P.U.O.
10. Pleurisy, pleurodynia, or pain in chest.
11. Loss of weight.
12. Anorexia.
13. Anaemia and debility.
14. Amenorrhoea.
15. Pneumonia.
16. Ischio-rectal abscess.
17. Erythema nodosum.
18. Phlyctenular conjunctivitis.
19. Contact.

Provisional Clinical Diagnosis
(if helpful)

REPORT ON FILM

For F. A. NASH
(Medical Director).

TABLE III.—Age, Sex, Marital Status: Comparison with General Population of London

	Marital Status	Actual Patients X-rayed	Expected from General Population Distribution*	Excess + (or Deficiency -) of Actual over Expected
Males:				
0-14 years ..		80	306	-226
15-24 ..	Single	212	143	+69
	Married†	29	24	+5
25-44 ..	Single	128	106	+22
	Married	465	377	+88
45+ ..	Single	53	54	-1
	Married	351	400	-49
All males ..		1,318	1,410	-92
Females:				
0-14 years		64	293	-229
15-24 ..	Single	355	152	+203
	Married	122	58	+64
25-44 ..	Single	155	107	+48
	Married	667	405	+262
45+ ..	Single	74	121	-47
	Married	277	486	-209
All females ..		1,714	1,622	+92
Total patients ..		3,032	3,032	—

* Based on 1951 census, 1% sample tables for London A.C.

† Including widower and divorced.

The higher percentage of tuberculous lesions in single examinees could be due to a number of causes. Single people may, for various reasons, be less likely to attend their doctors for symptoms 1 to 19, listed above, when non-tuberculous or less serious, than married people, so that when they do attend suspicion may be justifiably increased. Conversely, giving the same effect, married people, when off-colour, may be more likely to attend their doctors because they have husbands or wives to send them. The incidence of these symptoms without tuberculous origin could be higher in married people than in single people. Doctors may be "under-referring" single people. Another possible explanation is that there may be more pulmonary tuberculosis among the single than among the married. (Of course, no deductions about this last point are permissible, as our patients are a highly selected group.) So marked is the effect of marital status on the diagnostic yield that its im-

portance often outweighs that of the particular symptom (within the group of symptoms 1 to 20) of which the patient complains.

Does the presence of any particular symptom or symptom-complex give a specially high yield of pulmonary tuberculosis? Some interesting impressions can be gained from scrutiny of Tables V and VI. The reader will be able to

TABLE V.—Symptoms and Result

Symptom	Total Sent for x-ray	Outcome							
		Referred to Chest Physician*		Referred to Chest Hospital†		Heart and Other Abnormality		N.A.D.	
		No.	%	No.	%	No.	%	No.	%
Cough ..	1,727	59	3.4	12	0.7	97	5.6	1,559	90.3
Reflex dyspepsia ..	124	6	4.8	1	0.8	6	4.8	111	89.6
Dyspnoea ..	289	9	3.1	2	0.7	23	8.0	255	88.2
Laryngitis ..	117	5	4.3	—	—	4	3.4	108	92.3
Latissitude ..	698	20	2.9	4	0.6	20	2.9	654	93.6
Bronchial catarrh ..	547	9	1.6	5	0.9	54	9.9	479	87.6
Influenza (out of season) ..	81	2	2.5	—	—	4	4.9	75	92.6
Recurring febrile chills ..	175	3	1.7	1	0.6	3	1.7	168	96.0
P.U.O. ..	31	1	3.2	—	—	1	3.2	29	93.6
Pleurisy, pleurodynia, or pain in chest ..	821	19	2.3	7	0.8	35	4.3	760	92.6
Loss of weight ..	531	19	3.6	5	0.9	18	3.4	489	92.1
Anorexia ..	181	8	4.4	—	—	4	2.2	169	93.4
Anaemia and debility ..	142	6	4.2	—	—	8	5.6	128	90.2
Amenorrhoea ..	32	—	—	—	—	1	3.1	31	96.9
Pneumonia ..	51	3	5.9	1	2.0	4	7.8	43	84.3
Ischio-rectal abscess ..	10	2	20.0	—	—	1	10.0	7	70.0
Erythema ..	14	4	28.6	—	—	3	21.4	7	50.0
Phlyctenular conjunctivitis ..	8	—	—	—	—	—	—	8	100.0
Haemoptysis ..	26	3	11.5	1	3.9	3	11.5	19	73.1
Contact ..	262	8	3.0	—	—	6	2.3	248	94.7
No symptoms specified ..	97	1	1.0	—	—	—	—	96	99.0
Total cases ..	3,032	91	3.0	18	0.6	140	4.6	2,783	91.8
Average period since onset of symptoms (weeks)‡ ..	14.3	6.8	21.5	16.6	14.4				

* With lesions probably tuberculous.

† With lesions probably non-tuberculous.

‡ Calculated on 961 cases. The numbers of cases on which this average is calculated for the four separate categories of outcome were respectively (from left to right) 18, 2, 23, and 918.

TABLE IV.—Age, Sex, Marital Status of Patients and Disposal

	Marital Status	Total Sent for X-ray	Referred to Chest Physician*		Referred to Chest Hospital†		Heart or Other Abnormality		N.A.D.	
			No.	%	No.	%	No.	%	No.	%
Males:										
0-14 years ..		80	1	1.2	—	—	3	3.8	76	95.0
15-24 ..	Single	212	2	0.9	—	—	9	4.3	201	94.8
	Married	29	—	—	—	—	1	3.4	28	96.6
25-34 ..	Single	103	8	7.8	2	1.9	2	1.9	91	88.4
	Married	234	8	3.4	—	—	12	5.1	214	91.5
35-44 ..	Single	25	2	8.0	1	4.0	2	8.0	20	80.0
	Married	231	7	3.0	2	0.9	14	6.1	208	90.0
45+ ..	Single	53	1	1.9	1	1.9	5	9.4	46	86.8
	Married	351	14	4.0	7	2.0	38	10.8	292	83.2
All males ..		1,318	43	3.3	13	1.0	86	6.5	1,176	89.2
Females:										
0-14 years		64	4	6.2	—	—	—	—	60	93.8
15-24 ..	Single	355	13	3.7	—	—	8	2.2	334	94.1
	Married	122	2	1.6	—	—	2	1.6	118	96.8
25-34 ..	Single	102	5	4.9	—	—	4	3.9	93	91.2
	Married	389	7	1.8	—	—	12	3.1	370	95.1
35-44 ..	Single	53	8	15.1	—	—	3	5.7	42	79.2
	Married	278	—	—	—	—	9	3.2	269	96.8
45+ ..	Single	74	3	4.1	1	1.3	7	9.5	63	85.1
	Married	277	6	2.2	4	1.4	9	3.2	258	93.2
All females ..		1,714	48	2.8	5	0.3	54	3.2	1,607	93.7
Total patients ..		3,032	91	3.0	18	0.6	140	4.6	2,783	91.8

* With radiologically significant lesions, probably tuberculous.

† With radiologically significant lesions, probably non-tuberculous.

TABLE VI.—*Limited Combinations of Symptoms or Single Symptoms Only*

Symptoms or Combination of Symptoms	Total Cases Referred with Symptoms	Referred to Chest Physician*		Referred to Chest Hospital†		Heart or Other Abnormality		N.A.D.	
		No.	%	No.	%	No.	%	No.	%
1. Cough alone	502	15	3.0	1	0.2	31	6.2	455	90.6
2. Cough, pleurisy, or pain in chest only	157	1	0.6	4	2.6	6	3.8	146	93.0
3. Cough and lassitude only	72	6	8.3	—	—	—	—	66	91.7
4. Cough and loss of weight only	85	6	7.0	2	2.4	8	9.4	69	81.2
5. Cough, loss of weight, lassitude only	47	—	—	—	—	1	2.1	46	97.9
6. Cough, loss of weight, lassitude, anorexia only	8	3	37.5	—	—	—	—	5	62.5
7. Cough, dyspnoea only	25	2	8.0	—	—	2	8.0	21	84.0
8. Cough, dyspnoea, pain chest only	18	—	—	—	—	1	5.6	17	94.4
9. Cough, dyspnoea and loss of weight only	10	2	20.0	—	—	1	10.0	7	70.0
10. Cough, laryngitis only	29	3	10.3	—	—	1	3.5	25	86.2
11. Cough, bronchial catarrh only	86	2	2.3	—	—	5	5.8	79	91.9
12. Pleurisy or pain in chest alone	273	5	1.8	2	0.7	10	3.7	256	93.8
13. Reflex dyspnoea alone	20	3	15.0	1	5.0	2	10.0	14	70.0
14. Lassitude alone	72	—	—	1	1.4	2	2.8	69	95.8
15. Lassitude, loss of weight only	38	—	—	—	—	2	5.3	36	94.7
16. Loss of weight alone	62	1	1.6	—	—	—	—	61	98.4
17. Bronchial catarrh alone	84	1	1.2	2	2.4	4	4.8	77	91.6
18. Influenza out of season alone	35	1	2.9	—	—	2	5.7	32	91.4
19. Pneumonia alone	14	2	14.3	—	—	2	14.3	10	71.4
20. Haemoptysis alone	6	—	—	—	—	1	16.7	5	83.3
21. Haemoptysis and cough only	9	1	11.1	—	—	2	22.2	6	66.7
22. Contact alone	122	5	4.1	—	—	2	1.6	115	94.3

* With radiologically significant lesions, probably tuberculous, requiring investigation.

† With radiologically significant lesions, probably non-tuberculous, requiring investigation.

compare these figures with his personal experience so far as his memory or records are quantitative. The presence of symptoms sufficient to send the patient to the doctor, and to get the doctor to use the scheme, gives a yield of 3% of radiologically significant lesions, probably tuberculous, requiring investigation. The hospital clinician may be surprised to see that of 47 people referred with cough, loss of weight, and lassitude none were tuberculous. However, we are dealing with small numbers, and chance fluctuations are correspondingly large. If we combine items 3, 4, and 5 of Table VI we get for "cough with loss of weight and/or lassitude" 12 tuberculous out of 204, or 5.9%. Cough with laryngitis yields 3 tuberculosis suspects out of 29 (10.3%), but cough with "bronchial catarrh" yields only 2 out of 86 examinees (2.3% probably tuberculous). Lassitude alone (72 cases) or lassitude accompanied with loss of weight only (38 cases) did not indicate one case of tuberculosis. Bronchial catarrh alone (84 examinees) or influenza out of season alone 35 (examinees) did not yield any cases of tuberculosis.

The Time Factor

The average period since the onset of symptoms was 14.3 weeks (calculated on 961 cases out of 3,032 in which the doctor had stated the duration on the x-ray request form).

The duration of symptoms was given for only 18 of the 91 patients who had radiologically significant lesions, probably tuberculous, requiring investigation—and here the average period since onset was 6.8 weeks.

The duration of symptoms according to age and sex was examined in relation to the yield of tuberculosis (referred to chest physician). As might be expected, of 57 people aged 45 and over whose symptoms had lasted more than 13 weeks none had x-ray evidence of tuberculosis. Presumably among these were many chronic bronchitics.

It has surprised and pleased us to see the remarkably small extent of the "tuberculous area" in films of cases which were active. X-ray evidence of cavitation was absent in 70% of cases. Half (48%) of the cases had only one zone affected; 28% had only two zones affected; 11% had disease in three zones; and only 13% had more extensive disease.

If only one patient in 30 referred has significant pulmonary tuberculosis, does the scheme encourage the profligate and wasteful use of x-ray films? Use of the scheme was uneven. Thirteen doctors out of the 183 using it accounted for nearly half the total of patients. So far as cases referred to chest physicians are concerned, there is no suggestion that, on the whole, physicians were using different criteria in selecting patients for radiology. For doctors who used the scheme three times or more but fewer than 25 times the yield of tuberculosis was 2.9%, from 954 patients. Out of the 2,001 patients submitted by doctors who used the scheme 25 or more times in the period reviewed, 2.8% were tuberculous, which is not significantly different from the average percentage of 3.0. Thus, while some practitioners used the scheme more than others, it cannot be claimed that there is any real evidence of diminishing returns, dilution, or overuse in the frequent, as compared with the infrequent, users.

The figures suggest that many doctors made under-use of the scheme, probably because they hesitate to send a patient to hospital for an x-ray examination unless there is a fairly high probability that it will show an abnormality. They perhaps hesitate because they have come to feel slightly disconcerted when several patients have been returned to them with negative findings. The general practitioner knows that, from the point of view of his needs, local x-ray resources are pitifully inadequate, being already monopolized by the hospital medical departments. We believe that until the general practitioner loses the habits acquired during a lifetime of practice with inadequate diagnostic facilities, tuberculosis will continue to be discovered far later than it should be, with the consequent waste of lives and the costly "medicated survival" of cases which should have been cured if they had been found earlier. With recent advances in treatment, early diagnosis has never before been so important as now, when so much can be done if it is done in time.

The 57 tuberculous cases found by the "frequent users" had 30% cavitation; 51% had one zone; and 19% had two zones affected. The 34 cases referred by doctors who used the scheme less than 25 times had 32% cavitation; 44% had one zone; and 41% had two zones affected. This again suggests that all the practitioners were to an equal extent x-raying minor-symptom cases of a type that they would not normally send to the chest clinic. This conclusion is reinforced by the fact that the chest clinic first attendances in the area have not decreased as would be expected if the examinations made by the mass radiography units were only of patients who would otherwise have been x-rayed at the clinics. The "early" extent of the disease also confirms the impression that the patients examined in our scheme differ in type from those usually referred to chest clinics. Again, the rate for confirmed active tuberculosis (20 per 1,000) differs from the rate of tuberculosis in primary attenders at most chest clinics—that is, we are working in a different zone of diagnostic yield, the importance of which we have tried to measure in this paper.

Summary

A scheme offering unlimited chest x-ray facilities for general practitioners is described. Such a service could be provided in large towns if mass x-ray teams concentrated entirely on examination of general practitioners' cases.

The incidence of minor respiratory symptoms which are agreed by specialists to indicate the need for a chest x-ray film is so high in general practice that if the practitioner accepted the criteria and used the x-ray services available the clinics would be overburdened.

Early pulmonary tuberculosis mimics the symptoms of commoner minor ailments. It is a wolf in sheep's clothing.

These difficulties are well known to general practitioners, but the relatively narrow field of specialist experience has prevented the experts and the medical planners from being fully aware of them.

In general practice pulmonary tuberculosis is often diagnosed only on a "time" basis, after elimination of other causes, as distinct from "instantaneous diagnosis" by x-ray examination.

It may be objected that by offering unlimited x-ray facilities to general practitioners the profligate use of film is encouraged. No evidence of dilution was found to suggest that those doctors who used the scheme intensively had a lower discovery rate than those who x-rayed less often.

Figures are given for the incidence of pulmonary tuberculosis in patients referred with different symptoms or symptom-complexes.

Attention is drawn to the importance of radiological examination of unmarried people of both sexes who present with certain symptoms.

General practitioners must not feel disconcerted when many x-ray examinations yield nothing abnormal. This is the price of early diagnosis. The practitioner should use the miniature chest film with as little hesitation as he uses his stethoscope.

Tribute should be paid to the 183 general practitioners without whose enthusiastic participation the scheme could not have been started. We thank Dr. P. C. Anderson for advice and co-operation in the interpretation of films. We are also much indebted to the staff of the mass x-ray service for their indispensable assistance.

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The Department of Rheumatic Diseases of the West London Hospital has again with great promptness issued its annual report for the preceding year, and as usual it is full of interesting and useful information, including reports of original work. Of the patients who attended for treatment during the year, 33.2% were suffering from osteoarthritis, 12.8% from rheumatoid arthritis, 8.6% from the lumbar disk syndrome, 5.5% from capsulitis of shoulder, 3.2% from cervical disk syndrome, 2.6% from ankylosing spondylitis, 2.1% from psychogenic rheumatism, and 1.7% from gout. In his preface to the report Dr. W. S. C. Copeman, physician in charge of the department, mentions that gold salts are still found to be the most satisfactory single medicinal agent in the treatment of rheumatoid arthritis, and a large clinic, specially for these injections, has been organized. Research has continued into the most effective method of treating rheumatoid arthritis with cortisone and A.C.T.H.

TREATMENT OF BOWEL INFECTIONS OF THE TROPICS*

BY

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Bowel infections are notoriously prevalent in the Tropics, where they cause much morbidity in both the indigenous population and the European personnel serving there. The infections briefly can be divided into: (1) bacillary, (2) protozoal, and (3) helminthic. For most of these there is now available some reasonably effective treatment, and for some there is very effective specific treatment. It is with the specific treatment of a few of them that I propose to deal.

Bacillary Infections

Among the more important of the bacillary infections are the bacillary dysenteries and cholera; and typhoid, in view of the particular damage it causes to the bowel, may be added to them. The bacillary dysenteries and cholera are caused by infections which are localized within the bowel; in the former in the large intestine and in the latter in the small intestine. Typhoid is, of course, a generalized or systemic infection, and I do not propose to consider it as primarily a bowel infection.

The demonstrations by Marshall *et al.* (1941) of the efficacy of sulphaguanidine in the arrest and eradication of acute bacillary dysenteric infections in children in the United States was the beginning of the specific chemotherapy of the bacillary dysenteries. The findings of Marshall and his co-workers were rapidly confirmed by Fairley and Boyd (1943) on troops in the Mediterranean area, where bacillary dysentery had more than decimated the forces during the first world war. The speedy adoption by the British Forces of sulphaguanidine as a specific for the bacillary dysenteries was followed by the virtual disappearance of these diseases as a major cause of morbidity and mortality during the second world war. For a normal adult the dosage is an initial one of 6 g., and this is followed by 3 g. four-hourly, and then eight-hourly for two or three days into convalescence. The drug must not be continued for more than 10 days.

When sulphaguanidine was in short supply other sulphonamides, notably sulphapyridine, had been tried and been found also to be specific in the arrest of these infections. Their use in such a dehydrating febrile disease in a hot climate not uncommonly led to crystalluria and renal obstruction; where facilities were not immediately available to relieve this by ureteral lavage, deaths followed from uraemia. As a result the use of the freely absorbable and diffusible sulphonamides in the treatment of the bacillary dysenteries was discouraged among the British Forces, and the comparatively non-absorbable sulphaguanidine was adopted as the standard specific drug. Sulphaguanidine was followed in due course by other compounds with similar properties, of which succinylsulphathiazole and phthalylsulphathiazole are those most used. These are said to be even more effectively bacteriostatic than is sulphaguanidine, and in civil practice they now largely replace the sulphaguanidine of the war years. They are used in similar dosage.

The Americans have been less averse to the employment of the absorbable sulphonamides for the treatment of the bacillary dysenteries than are the British. There is some agreement that sulphadiazine is the most therapeutically

*Read in the Section of Tropical Medicine at the Joint Annual Meeting of the British Medical Association and Irish Medical Association, Dublin, 1952.