The Dean,
The Faculty of Medicine,
University of Edinburgh.

Dear Sir,

I beg to submit the following thesis for the completion of the degree of Doctor of Medicine of the University of Edinburgh, for your approval and I hope acceptance.

The work was carried out in the Union of South Africa during the last War when I was occupying the post of Imperial Liaison Registrar with the British Military Mission in Durban.

I qualified at the University with M.B., Ch.B. in July 1940, and passed the Clinical part of the M.D. in July 1942.

I have the honour to be, Sir,
Your obedient servant,

19 December 1942.
A Thesis on

THE SIGNIFICANCE OF HIGH EOSINOPHILIA IN THE AFRICAN NATIVE OF THE UNION OF SOUTH AFRICA AND OF THE PROTECTORATES
Permission for Publication of the Cases

Granted by the Director General of Medical Services, U. D. F.
South Africa.

In reply please quote.

O.C. No. 180 Military Hospital, SPRINGFIELD.

PUBLICATION OF MILITARY CASE RECORDS BY MEDICAL OFFICER.


2. The DGMS has no objection to Major GLASS using the Clinical Records of military patients for the purpose mentioned, providing names, numbers and Units are not mentioned.

(AUTHORITY DGMS M.D.49/2 dated 26 JAN 46).

LT. COLONEL
ASSISTANT DIRECTOR OF MEDICAL SERVICES.
NATAL COMMAND.
In this paper it is proposed to demonstrate, by a series of cases which came under my care and by reference to others described in the literature, the significance of high eosinophilia in the African native of the Union of South Africa and the neighbouring Protectorates.

An Eosinophile leucocyte is described, the staining procedure, its normal proportion in the white cell count of the blood given. The significance of eosinophilia in general and the conditions under which it occurs are reviewed. The geographical situation of the country and the possibility of conditions leading to eosinophilia in the African is described, and the possibility of African troops picking up the diseases leading to an eosinophilia from these areas and from other world theatres of war, is assessed.

The methods of study employed were immediate blood counts and differential white blood counts of a large number of African soldiers admitted to Springfield Military Hospital, Durban, South Africa. Where an eosinophilia was found present to an appreciably high degree (low eosinophilia counts being excluded) the clinical course of the disease was followed to ascertain if it was specifically responsible for the eosinophilia discovered. Investigations of these diseases were conducted to the full, including examinations of excreta for parasites, and radiological study where indicated. The effect of treatment specific or conservative with its relation to the change in the eosinophile count was noted though surveillance through the duration of the eosinophilia was not in all cases possible, for the native soldiers were discharged from hospital when clinically fit for military service, and follow-ups were not possible for unit medical officers had not the local facilities to continue investigations and submit records.

A series of cases are recorded with relevant positive findings. Considerable difficulty was met with in taking histories for the native has little education, is not trained in time and date memory, and the interpreters though impressed with the need for gaining accurate histories, in the main came up against extreme difficulties in their efforts.
A discussion of the cases with tables is conducted and a summary of all findings is made, and necessary conclusions are drawn.
The white corpuscles of the blood numbering approximately 8,000 /c.mm. on the average in a healthy individual, are composed of different varieties, each apparently having some particular significance of its own where its normal proportion balance to the other varieties is disturbed.

Of the three leucocytes, the neutrophil eosinophil and basophil, the second type has our attention in this paper.

The eosinophil leucocyte 10 to 14 microns in size with pale staining nucleus, is normally existant in the blood in the proportion of one to four per cent of all white cells, as assessed by the differential white blood cell count in a stained blood film. This cell differs from its neutrophil cousin in that it contains a type of cytoplasmic granulation which is much bigger in size, more refractile, more shiny and more acidophilic in character so that the granule taking up the eosin stain is a bright orange red. It has been suggested that these granules are the results of haemoglobin from the red blood corpuscles which have been broken down and deposited as the recognised eosinophilic granules. There are 50 to 400 eosinophils per cubic millimetre of blood in a normal count.

Diagramatic Representation of

Neutrophil

Eosinophil

r. h. c.
Apply one end of a clean slide to a drop of fresh blood taken from the patient's ear. The narrow edge of a second clean slide is placed in the drop and held there till the blood has spread across it; it is then drawn slowly over the whole length of the first slide. The inclination of the second slide to the first is an angle of about 45 degrees, and no pressure is exerted between the two surfaces. Smooth spreading of the film is aided by warming the first slide in the flame of a spirit lamp immediately before applying it to the blood. After the blood is spread it should be waved rapidly in the air to dry it without undue shrinkage of the cells. Flies should be prevented from gaining access to the slide for the blood is sucked up by them and the film destroyed.

The film is now fixed and stained by the use of Leishman's stain method.

The stain is a compound of alkaline medicinal methylene blue and eosin, extra B.A. (Gruulker), dissolved in pure methyl alcohol in the proportion of 0.5%. The dry film is well covered by the stain, which should be evenly distributed over the entire slide. After one minute distilled water, double the quantity of stain, measured by pipette is carefully added and mixed with the stain. After seven minutes the mixture is poured off and the film now covered with distilled water for two minutes. The water is then washed off with fresh distilled water and the stained film gently blotted with clean blotting paper.

The Differential White Count. The film is now examined under low power and then high power of a microscope in good light and between two hundred to five hundred white cells are counted, noting the proportion of each type per cent. The eosinophils normally number from one to four per cent, or fifty to four hundred per c.mm. Numbers in excess of these figures constitute the clinical entity of Eosinophilia.
Eosinophilia is found in the following conditions:

(1) Parasitic
(2) Allergic
(3) Skin Diseases
(4) Acute Infections
(5) Blood Diseases
(6) Miscellaneous Conditions

(1) Parasitic. An eosinophil increase of the blood cells is found in helminth parasitic and in certain other parasitic infestations.

Taeniasis: (a) taenia solium, (b) taenia saginata, (c) dipylidium caninum, (d) diphyllobothrium latum and diphyllobothrium cordatum, diphyllobothrium pervum, diphyllobothrium houghtoni, and diplogonoporus grandis and braunia jassyensis, (e) hymenolepis nana.

Also increase in oxyuris vermicularis, in hilharziasis or invasion with schistosoma haematobium, S mansoni and S matthei. Further it is also increased in anchylostomiasis where anchylostoma duodenale, necater americanus, A malayanum, A braziliense and A caninum may be the offending metazoa. Anchylostomiasis may be further complicated, as indeed may any of the others by chronic malaria or chronic amoebic dysentery to give the "human shadow" picture in man where eosinophilia is also evident.

Other worm infestations producing the blood picture are ascaris, taenia echinococcus, trichuris, filaria, distoma, coccidiodial granuloma and dracontiasis.
Van der Sar and Hartz describe three cases of tropical eosinophilia with microfilaria demonstrated in eosinophilic abscesses and infiltrates in the enlarged lymph glands. The clinical symptoms disappeared after a course of malarside.

Mites have been discussed in the aetiology of eosinophilia, but Melsen Bahr and Mugleston have isolated mites from the intestine in cases where no demonstrable disease existed.

(2) Allergic.

(a) Bronchial Asthma. Eosinophilia as a manifestation of an allergic state has been demonstrated in a large variety of conditions. It has been shown in a well recognised allergic condition, that of bronchial asthma, being evident by an increase in the blood eosinophils and by eosinophil leucocytes being shown in large quantities in the sputum. The eosinophilia is said to average six per cent though several degrees are quoted (Herrick) varying to ten per cent, thirty-three and third per cent, sixteen per cent, twenty-five per cent and fifty-three and a half per cent.

(b) Transient Lung Consolidation in Asthmatic Children. Soderling describes cases of transient lung consolidation as a well defined diagnosis in typical cases but it is one which calls for frequent X Ray examinations. In complicated cases the diagnosis is substantiated in the first place by the transient nature of the condition which is usually a matter of hours. If the condition persists for some time then the diagnosis becomes more uncertain. It is necessary to show an allergic set of manifestations by demonstrating asthma, eosinophilia or other hypersensitivity. An eosinophilia here is not always immediately shown. The attack of asthma may be precipitated by the upper respiratory infection and the
Asthma may then produce these transient lung consolidations with eosinophilia.

The condition is not only interesting as an allergic condition but is important in the differential diagnosis of so-called atypical broncho and lobar pneumonias - the "one day pneumonia" and of tuberculosis, which it simulates radiologically, and from pulmonary signs especially in cases complicated by a tuberculin positive test. It is stressed here that eosinophilia may not always be demonstrated as a simultaneous infection may change the blood picture, but not the transiency of the entity.

Soderling further says that the chief significance of eosinophilia is probably a reaction against a protein which is foreign to the species and at the present time the allergen must be considered to be protein in nature; but other allergen substances e.g. carbohydrate, may exist and nothing is known of their capacity to give rise to an eosinophil blood picture. It is possible that different protein allergens may cause different degrees of eosinophilia.

(c) Engel's privet cough. Engel described cases in his experience in China and which he himself contracted. The disease was manifest in May and June when a species of privet called ligustrum flowered then and the pollen was said to produce a cough and sputum with a metallic taste. Engel himself had an eosinophilia of twenty to twenty-five per cent, B.S.R. 10 mms./hour and massive pulmonary consolidation which cleared off in one day after which he was fit for work.

(d) Allergy with Periarteritis nodosa This is quoted as an allergic condition producing eosinophilia in some case. Recovery followed salvarsan substitute therapy.
periarteritis nodosa showing lung mottlings with wide spread dense vascular shadows and associated eosinophilia, and he quotes Middleton and Carter's studies of thirty-one such cases where seventy-seven per cent showed a marked eosinophilia. Eckles suggested a serial of radiographs of lung fields in a suspected case of periarteritis nodosa would be a valuable aid to diagnosis.

Vice Rich describes post-mortem examinations of five patients who had died following therapeutic injections of foreign serum. Vascular lesions characteristic of periarteritis nodosa were found in the viscera and the polymorph infiltrates contained eosinophils. He deduced that cases with vascular lesions of this type were a manifestation of an anaphylactic type of sensitivity. Rich describes a further case where biopsy was conducted on a patient following a sensitivity reaction and in the periarteritis nodosa eosinophils were found.

(a) Allergy with Asthma. It has been suggested that eosinophilia is produced by certain substances elaborated by various agents, and in asthma and hay fever it is diagnostic of protein sensitisation. Eosinophilia in asthma shows a variable increase in some cases, and none in others. It is quoted that of three hundred and seventy differential leucocyte counts on three hundred and forty-six patients with asthma, hay fever and allied conditions; non-sensitive asthmatic bronchitis and bronchial asthma each produced seven per cent of the cases of eosinophilia, non-asthmatic bronchitis two per cent, hay fever seven per cent for perennial and five and a half per cent for seasonal. Several cases of asthma are recorded where no eosinophilia occurred. But it must not be forgotten that asthma is by no means one clinical disease but rather a sign of many and varied
conditions normally regarded as aetiological factors in the production of asthma. For example asthma produced as the result of psychiatric stimulus is not to be closely compared with an asthmatic attack caused by the inhalation of a sensitive pollen. As a consequence it is not to be wondered at that the eosinophil picture in this asthmatic group shows such a variable response as recorded by several writers.

Allergy due to parasitic infestation shown by pulmonary signs

A series of thirty cases reviewed by Soysa and Jayawardena investigating asthmatic signs is of interest and all these had marked eosinophilia, and an attempt was made to isolate pulmonary acariasis as the main aetiological factor.

Investigation of the sputum for mites according to the method described by Carter, Wedd and D'Abrera (1944) was carried out without a constant finding. The mites reported in Carter, Wedd and D'Abrera's cases were of the genera tyrophysus, tarsonomus, carpelyphas, glyciaphagus and cheyletus.

Most of the cases reviewed were occupied in dust laden store rooms in which the mites were isolated and only one had a family of asthma. The stools of these cases were examined for parasitic infestation, and a few of the cases had anchylostoma duodenale, ascaris lumbricoides, trichuris trichura, blastocystis hominis, trichomanis facialis.

Routine asthmatic treatment failed to lower the eosinophilia. It was concluded that the syndrome of asthma and eosinophilia corresponded to that described by Frimodt-Moller and Baran (1940) as "pseudo-tuberculosis" associated with eosinophilia, and by Weingarten (1943) as "tropical eosinophilia", by Treu (1943) as "pseudo-tuberculosis with eosinophilia", by Simeons (1943) as "benign eosinophil leukaemia" and by Chandhurn (1943) as "eosinophil lung". Weingarten gave arsenic in 1936.
to one of his patients who had recurrent syphilis complicating the condition and he noted complete disappearance of the eosinophilia following the therapy.

Acetylarsan was used by Trou (1941) with success, and by Simeons mapharside in ten per cent calcium gluconate. Soysa and Jayawardena used carbarsone or stovarsol in the treatment of their cases.

However in spite of the investigations carried out by Soysa and Jayawardena, they failed to prove that the mites were the causative factor in the production of the asthma with eosinophilia; in any case they record that mites were not found in the sputum of all their cases. Surely if mites were responsible then a vast proportion of the general public in Ceylon and similar sub-tropical areas would show signs of the syndrome, for the majority of people work among dusty surroundings including the housewife who sweeps the dust of her house into the air and then inhales it. No control examinations were carried out and they failed to prove that the mites were anything but casual non-sensitising parasites, evident in but not affecting a small proportion of their cases. In only three cases infested by mites as examined by Carter, Wedd and D'Abrera was an eosinophilia noted.

Weingarten in his description of "tropical eosinophilia" disagrees with an allergic hypothesis. He stresses the etiological factor as being that of proximity to the sea. He describes his cases as having lassitude, evening pyrexia of 100°F, lasting for a week and followed by a dry hacking cough with wheezing, which was worse at night and lasting many weeks. Sometimes the typical picture of bronchial asthma was seen in this syndrome. Examination of the sputum showed clumps of eosinophils frequently present, but rarely any Charet-Leyden crystals. X-Ray examinations of the lungs revealed a diffuse mottling. Enlargement of the spleen was noted. There was
an absence of gastro-intestinal symptoms.

Emerson contributes a record of a case of tropical eosinophilia in a U.S.A. sailor appearing eight months after his return to the United States from India. All signs and symptoms disappeared with carbamide.

Müller gives an interesting contribution to the study of allergy and eosinophilia in his own self-imposed experiment of eating material containing ascaris ova and recording X Rays of his lungs, which showed a mottling as fleeting multiple infiltrates. He suggested the radiological picture in ascaris infection is produced by the passage of ascaris larvae through the lungs.

A further interesting case demonstrating an allergic etiology is described by Doris and Hicks. Here eosinophilia was associated with amoebiasis, Löffler's syndrome being discussed in association with the latter as a manifestation of allergy. There was a 19.9% eosinophilia, and the stools contained cysts of entamoebae histolytica. It was suggested that the specific allergen of E. histolytica was causing the symptoms, but that the allergens capable of producing Löffler's syndrome were as variable as those giving rise to other manifestations.

A link of tropical eosinophilia with certain other medical entities is found with atypical pneumonia, trypanosomiasis and paroxysmal haemoglobinuria in that the cold agglutination test is positive in each of them. Viswanathan and Natarajan found it positive in 87% of their sixty-one cases of tropical eosinophilia. It would be interesting to know if cold agglutination was positive in the majority of all cases evidencing eosinophilia.

Apley and Grant describe a set of five cases of tropical eosinophilia seen in England with cough and wheeziness at night, absence of physical signs
in the chest; there was an absence of pulmonary signs except when an exacerbation occurred when the signs were those of spasmodic bronchitis, and a persistent high blood eosinophilia.

Parsons-Smith contributes a case of Weingarten's tropical eosinophilia which he met in Egypt, lasting over a prolonged period and responding to neosarsphenamine.

Loffler in 1932 describes his syndrome as fleeting lung infiltrations with eosinophilia which appears suddenly and disappears within a fortnight.

This sudden appearance and disappearance of eosinophilia and lung change was unlike the series of cases described by Frimodt-Møller and Barton where the picture lasted in some cases over a considerable period of years. It is of practical importance in the differential diagnosis with miliary tuberculosis, though in the latter the linear markings were not so well defined as in this "pseudo-tuberculous condition associated with eosinophilia". Of a hundred and seventy-five of their patients, a hundred and six had more than 5,000 eosinophil leucocytes per c.mm. on admission, 48% had intestinal infection with the helminths, E. histolytica or Giardia, and 69% were tuberculin negative. The lung condition found could not be explained by them as due to tuberculosis, heart disease or syphilis, and an allergic origin was claimed. The treatment of two similar cases of "pseudo-tuberculosis of the lungs with eosinophilia" was contributed Treu. One he treated successfully with arsenic. The other was cured spontaneously by a spontaneous attack of lobar pneumonia. Simeons describes similar cases and prefers to call the condition "benign eosinophil leukaemia". The white blood count of his cases was 5,500 to 20,000 /c.mm., and the eosinophil percentage of the white corpuscles varied from twenty five to eighty-two. He treated
his cases with bi-weekly injections of meparside in 10% calcium gluconate, given for two to three weeks.

Harkavy goes so far as to assume eosinophilia and asthma present in his cases are diagnostic of an allergic state. In his cases symptom complex pictures are seen with a varying degree of hypersensitiveness, causing pulmonary-myocardial, pleuro-pulmonary-myocardial, or a pleuro-pulmonary-myopericardial states to final polyserositis. The allergic response to the toxin was a vascular reaction with tissue involvement giving these distinct syndromes. In all a degree of asthma and eosinophilia was present.

Further attempts at isolation of a specific cause for eosinophilia in Löffler's syndrome of transient pulmonary infiltration with blood eosinophils, low grade fever with mild leucocytosis, blood sedimentation rate increased and an eosinophilia of 10 to 30%, were made by Pirkle and Davin. They described the lower lung fields as being particularly infiltrated in the radiological pictures, these disappeared quickly and they do not cavitate. They stress its importance in the differential diagnosis with pulmonary tuberculosis. It is noteworthy that the stools of all the cases examined showed no trace of parasites. One case is described as having had pulmonary radiological signs for eight months. A similar case of Karen and Singer persisted for three months. No convincing aetiological factor for any of the cases was ever found, and an allergic basis was assumed. Comments on Soderling's cases point out that the transient lung consolidation probably explains atypical broncho-pneumonia, one-day pneumonia and so-called rapidly recovering tuberculosis. All these are of importance in the differential diagnosis.
Five further cases of eosinophil infiltration of the lungs were described by Hennell and Sussman. They say that Loffler stressed the importance of tuberculo-toxins but did not exclude the possibility of allergenic factors. Ascariasis and amoebiasis may furnish specific allergens causing symptoms in certain cases, while in others bacterial toxins, foods or pollens may be the responsible factors.

The shadows in the roentgen plates of the lungs were due to eosinophil infiltrations. Post-mortem records of such cases were furnished by Meyenburg, who viewed four cases dying of other causes while in the acute phase of this disease. Macroscopically the lungs showed no focal characteristic infiltration analogous to the pneumonias. Microscopically a high grade eosinophil concentration was present in the inflammatory exudates.

Two of the cases presented eosinophil bronchitis and bronchiolitis. Charcot-Leyden crystals were found in one of the pulmonary infiltrates. Eosinophilia of blood and bone marrow was present in all the cases, and in two cases eosinophil infiltrates were also present in the liver.

A further type of eosinophil pulmonary infiltration is pointed out by Kartagener. He agrees with Loffler's syndrome verified by himself and others, and he draws attention to chronic types which may last for months; which does not fit Weingarten's description of a case which may last for years. Kartagener classifies cases into three types; the first is acute and short-lived (Loffler's syndrome), the second with acute symptoms and lasting for months as described by Lohr and by Léon-Heidberg, and the third type described by himself with chronicity of time and a mild symptomatology. He postulates an allergic factor for them all though no bronchitis or asthma was evident in the third type.
(f) Allergy due to other Causes.

Eosinophilia has been demonstrated in food sensitivity, urticaria, and other allergic states including Henoch's purpura where 10 to 60% eosinophilia has been demonstrated. Eosinophilia has been said to be produced by the injection of any foreign protein, and is often prominent in tuberculin reactions. In angio-neurotic oedema the count may be very high.

(3) Skin Diseases.

Any infective or irritative condition of the skin is liable to produce an increase in the eosinophil concentration. This has been shown in the following skin diseases: pemphigus, dermatitis herpetiformis, scabies, psoriasis, eczema, prurigo and urticaria.

(4) Acute Infections.

Eosinophilia in general is said to diminish in the acute phase of an infection which initiates it, and to appear more prominently in the convalescent phase. This appears to be true in most infectious diseases. Friedman and Holtz studied the eosinophil response to rheumatic fever with particular reference to acute polyarthritis, rheumatism, and to acute and chronic rheumatic heart diseases. They found eosinophilia was absent or diminished in acute polyarthritis and acute carditis. During the stage of recovery eosinophils appear as they do following any acute fever. An important prognostic opinion is expressed, in that a continuous aneosinophilia or hypoc eosinophilia over long periods, following recovery from acute rheumatism indicates an intense activity of the infection.
They postulate that the reverse, that a recurrent or continuous eosinophilia indicates a good convalescence.

Brown says that eosinophilia is frequently observed in scarlet fever which he states is an important point of differential diagnosis from measles, in the laboratory. He also states that it is met with in some subacute and chronic tuberculous conditions. Brown also states that a tissue eosinophilia with or without eosinophilia of the blood is seen in many cases of chronic lymphadenitis, chronic appendicitis, and in a variety of conditions presenting the histological picture of chronic granulomatosis.

(5) Blood Diseases.

In leukaemia the eosinophil count may be greatly increased. In pernicious anaemia also there may be an increase, but pernicious anaemia does not occur in the African native.

(6) Miscellaneous Conditions.

There are a wide variety of conditions capable of producing an increase in the blood eosinophil concentration, and every type of toxin of no particular inter-relation appears to be involved in the aetiology from simple chemical to complex animal.

The black widow spider gives a bite which results in a condition simulating an acute abdomen. The bite produces an eosinophilia and this is diagnostically important when distinguishing between the two conditions when the history is not clear.

Hunter has recorded eosinophilia from chronic benzene poisoning. There are other chemical agents which may give an eosinophil picture on occasion, such as mercury and arsenic, sodium salicylate, nirvanol, sedormit (La Roche), and crude liver
therapy for macrocytic nutritional anaemia. Fouadin or trivalent antimony compound of pyrocatechin sodium disulphate used in the treatment of bilharziasis produces eosinophilia in some cases.

Russell studied men taking mepacrine in the tropics excluding those without demonstrable hook worm ova in their stools. Of a hundred and nineteen men taking mepacrine for malaria ninety (i.e. 75%) had an eosinophilia of 6 or more %, the highest being 27%. The average for the hundred and nineteen men was 8.4%. Among fifty on a suppressive malarial course thirty-six (i.e. 70%) showed 6 or more %, the average for the fifty was 7.2%. Among thirty-three who had never had mepacrine the average for the group was a 3% eosinophilia. A biopsy of fifteen cases showed an eosinophil hyperplasia of the bone marrow. It is believed to have been the result of mepacrine.

Ulcerative colitis, which has been considered by some investigators to be allergic in nature, may perhaps in some cases be due to parasitic infestation e.g. Schistosoma mansoni, or Bargen's diplostomatus.

Hodgkin's disease has been quoted, but it is doubtful if it occurs among the natives. Gelfand is by no means dogmatic on this score in his observations.

Eosinophilia is noted in cases of splenectomy within two hours to two days of the operation.

Eosinophilia is present occasionally, according to Brown, in idiopathic cases which terminate fatally, autopsy failing to reveal the cause of the changed blood picture.

Sex has no relation to the occurrence of eosinophilia.
Geographical Situation of South Africa

There is a wide distribution of the snail host of bilharzia - *physopsis africana* - affecting all rivers draining into the Indian Ocean, down to the Kynsa. The Witwatersrand appears to have formed an efficient barrier separating the western rivers draining into the Atlantic, and these are almost entirely free of infestation.

The bilharzia area has been shaded in on the map.

Towns quoted in the cases have been entered in green.
Conditions of Living Leading to Eosinophilia in the South African Native.

1. The South African natives are a primitive people with little knowledge of public health and hygiene. Sanitation of an inferior kind is practised in the villages, but relatively little in the poorer quarters of the towns. In many cases old tribal laws and customs, under the induna or chief, are being abandoned by the native who comes into contact with the white man. Without his own primitive social code to guide him, and when left undisciplined on his own, this elementary sanitation fails and he is then subject to every excremental, intestinal parasitic and other disease of which there are every type in abundance throughout the country.

2. Living accommodation is very limited and only in the form of shacks.

3. Water supply. There is no control, for the native obtains his water supply direct from the polluted rivers. Surface catchment water is contaminated by faeces indiscriminately dispersed, and this in turn drains into the river which is the source of supply for the native household.

Possibilities of African Troops Acquiring Diseases causing Eosinophilia.

1. Schistosomiasis is widely distributed along the line of the infested rivers (see map attached). Natives recruited from all these areas bring the infestation with them. No mass laboratory tests on stools and on urine are possible, and medical entry into the Army, because of the shortage of medical staff was not strict. (I boarded one man out of the Army who had been categorised as AI for two years, and who had no fingers on his right hand. He was placed on light duties, and posted from unit to unit in the C.M.F. finally being returned to South Africa described as "quite incapable of doing manual labour").

2. Many of the type who were recruited
The Urban Dweller. Where the native in a city lives after fatiguing days in Industry. Overcrowding and bad housing.

The Native Warrior

The old customs, laws and living retained, in healthy surrounds.
For the Army were men who had left their kraals and worked in the gold mines of Johannesburg and the diamond mines of Kimberley, and others.

There again absence of tribal life, close community living and many tribes mixing furthered the dissemination of parasitic infestation from one set of the community to the next.

3. South African and Imperial Protectorate native troops from Basutoland, Bechuanaland and Swaziland served overseas in North Africa, Egypt and Italy and were subject to diseases prevalent in these countries in their association with the natives of these territories.

Persons-Smith describes Tropical Eosinophilia in Egypt. Mepacrine was issued against malaria in Sicily and Italy. Russell's observations on eosinophilia from mepacrine have already been noted. In Egypt unhygienic conditions were worse than those prevalent in South Africa, and as flies were very much more numerous enteral diseases such as amoebic dysentery were even more common.

4. To offset the above paragraphs there is no doubt that Army hygiene compulsorily practised, sick parades for dealing with the individual's complaints, and good food cooked and served hygienically materially helped to cut down the diseases producing eosinophilia.

Mass differential counts of a draft of seventy-two native troops who were returned as category D (medically unfit) for demobilisation at Durban on 6 Jan 46 were done prior to dispersal to their homes. They showed only 5% eosinophil polymorphs in 5.5% of the draft. One showed an increase above 10%. The remainder showed no increase. As these men were returned as unfit the low incidence of significant eosinophilia is ample evidence of the better living conditions in the Army.

A cross-section control of hospital admissions in the country by differential counts showed 6% of three hundred examined with an eosinophilia of over ten per cent.
A series of cases examined with Eosinophilia among South African and Protectorate native troops.

It is again emphasised that the African native when questioned about the history of a complaint, is most vague and unintentionally misleading. The language difficulty, in spite of good interpreters, further complicated the taking of good case histories. Time is also of no meaning to the negro and few can gauge how old he is accurately. Time events are dated from a period before or after a great event e.g. "the great cattle drought".

Names, numbers and units of the men are not allowed for publication by the D.G.M.S. Union Defence Force, South Africa.
Case 1.

Age 38
Town Vryheid.
Admitted 6.11.45.
Discharged 19.1.46.
Diagnosis on admission Asthma.
Diagnosis on discharge Bilharziasis Bronchial Asthma.

Complaint Difficulty in breathing

Previous History

Had attacks of shortness of breath on several previous occasions, and was in hospital with the same complaint two months before for four weeks. The attacks first started when he was an adolescent.

History of Present Illness

About a month ago when he was still convalescent from his previous hospitalisation, his breathing, which had not really got better, began to show signs of deteriorating again. He was unable to do any heavy work in his unit, and his unit M.O. put him on light duties with a medicine for the day and another at night. This eased his condition somewhat, but as he was not getting any better he felt he should not have left hospital. The night before admission he had had a bad attack of difficult breathing, and he had had to sit up half the night until the unit doctor gave him an injection.

On Examination

General Appearance.
Temperature 36°, Pulse 80,
Respirations 18 per minute
(henceforth referred to as T P R)
Was brought in on a stretcher, with expiratory dyspnoea; mildly toxic appearance; does not say very much and concentrates on his breathing.
Has flabby body with poor musculature.

Cardio-Vascular System (C.V.S.)
- Sounds closed, regular, apex beat 4th 5th interspace. No enlargement. Pulse 80 per minute, regular in time and force, good wave. B.P. 134/76.

Respiratory System
- Even expansion of both lung fields, confirmed by palpation.
- Vocal fremitus (V.F.) not increased.
- On auscultation sibilant rhonchi scattered through chest with prolonged expiration. Harsh vesicular breath sounds. Vocal Resonance (V.R.) equal both lung fields.

Alimentary System
- No vomiting and no nausea.
- Bowels open regularly, no diarrhoea.
- Liver not enlarged.

Haemopoetic System
- Spleen not enlarged.
- White Blood Cell count (W.B.C.) 5,500 per c.mm. Eosinophils 14% : 770/c.mm. Neutrophils 42%; Large monocytes 2%, lymphocytes 42%.

Central Nervous System (C.N.S.)
- Not very intelligent man, co-operative. Exaggerated knee jerks.

Other Systems
- Nil abnormal detected (n.a.d.)

Special Investigations
1. Examination of stools for parasites.
2. X-Ray of chest.
3. Routine differential counts to watch eosinophilia.

Treatment
- Of the asthmatic attack with adrenaline min 1 per minute for status asthmaticus. Ephedrine gr.1 i.d. to control the asthma.
- Search for the cause of the asthma.

Progress Notes
7.11.45 Stool Ova Schistosoma mansoni.
- Developed status asthmaticus. 8 mins. of adrenaline injected.
- Treatment of S. mansoni to be delayed.
until the asthma is controlled.


Rx Linctus Heroin (gr 1/8) dr 2 at night when required. Not to be repeated more than once per night.

13.11.45 Bronch very numerous and heard all over the chest.

17.11.45 Chest clearer. Feels better. Started course of tartar emetic daily gr. 1/2, 1, 1 1/2, 2, 2, 2 continued every other day until a total of gr. 30 is reached.

20.11.45 Tartar emetic is making him feel nauseated. Change to foutain course. Is complaining of nasal blockage. E.N.T. specialist records "deviation of septum to left nostril, with poor airway, mucoid discharge present. No inflammation evident. Ears n.a.d."

23.11.45 Lungs much clearer. Complains of nasal blockage and permanent coryza. Is having ephedrine and menthol nasal drops b.i.d.

28.11.45 X Ray of air sinuses. Frontal sinuses are clear. Loss of translucency is present in left maxillary antrum, only the apex of the antrum is clear. No horizontal fluid level is present. Appearance suggests presence of a large cyst. Fairly marked mucosal thickening in the right antrum.

W.R. Blood is negative.

11.12.45 Vaso-motor rhinorhoea. E.N.T. specialist to carry out ionisation. Report is "it has been suggested by the radiologist that the patient has a left cystic antrum, but in my opinion his sinuses sometimes show T.L.M. with attacks of allergy. Treat with gattse ephedrine and ergyrol and transfer to a dry climate."

31.12.45 Urine ova of S. Haematobium were NOT observed.

1.1.46 Conjunctivitis of right eye. Patient refused cystoscope for a test for bilharziasis of bladder. Urine moderate number of calcium oxylate crystals, scanty pus cells c. 4 per H.P. field. No albumin and no sugar. NO ova of S. haematobium.
5.1.46  X Ray of chest. No loss of trans-lucency of lung field. Clinically has ronchi present in both lungs.

6.1.46  Conjunctivitis markedly improved with the zinc sulphate drops.

7.1.46  Sputum. No tubercle bacilli present.

10.1.46  Still gets asthmatic attacks at night. Conjunctivitis cured.

11.1.46  Stool. Still no parasites.

14.1.46  Stool. No parasites.

Intra-venous pyelogram. No calculi detected. Excretion took place fairly rapidly. Right kidney pelvis appeared normal. The dye was poorly concentrated in the left kidney pelvis. No evidence of urethral stricturing. Bladder filled normally.

18.1.46  Stool. No parasites.

Differential count. W.B.C – 6,400/c.mm.

19.1.46  Stool. No parasites.

Condition on Discharge

Appearance much healthier, no dyspnoea. Rhinorrhoea improved.

Commentary

This is a case of eosinophilia which may have been due to either the asthma, rhinorrhoea or the bilharziasis. As the last was treated and successive stools showed no parasites it may be assumed that the bilharziasis was cured. On discharge there was still an eosinophilia of 9%, which had dropped from 14%. One may assume that the allergic state of asthma and rhinorrhoea is the cause of the altered blood picture in this case.

The temperature was normal throughout the illness.

It is to be noted that feuadin has been recorded to produce an eosinophilia, and this may have prevented a more rapid reduction of the eosinophil level following treatment of the bilharzia infestation.
Case 2

Age 23
Town Maritzburg
Admitted 3.1.46
Discharged 30.1.46
Diagnosis on Admission Influenza.
Diagnosis on Discharge Eosinophilic infiltration of the lungs. Trichuriasis.
Complaint Cough and not feeling well.

Previous History

Has had occasional attacks of diarrhoea since adolescence. Does not complain of diarrhoea now. No other complaints that he can remember. Has had a similar attack before in 1942, lasting nine days. Melana 12 years ago.

History Of Present Illness

He was feeling perfectly well until three days ago, when he started complaining of a cough and a pain in the front of his chest, which became worse with each bout of coughing. He has brought up about half an ounce of sputum per day since the cough started. The sputum is not streaked with blood. The pain is substernal.

ON Examination

General Appearance T 99.6°, P 110 R 20.
A robust and fit young man of good physique, but who has a slight toxic appearance. There is no clubbing of the fingers.
C.V.S. Sounds closed, apex 5th space 3 1/2" from mid line.

Respiratory. Upper respiratory tract clear; equal expansion of lung fields. No apparent dyspnoea. Slight degree of ill-defined dullness over both lung fields. On auscultation scattered ronchi are heard throughout. V.R. not increased not increased on either side.

Alimentary System. Abdomen - pain or tenderness not complained of, or elicited on palpation.
Liver not palpably enlarged.
Bowels regular, once per day.
Stools usually formed but sometimes
Semi-formed.
Spleen not enlarged.

C.N.S. n.a.d.

Other Systems. n.a.d. on clinical examination.

Musculature Some pain in loin but rather vague, two days duration.

Treatment Rest in bed, expectorant mixture
Rx Ammon. Carb gr 5
Pot. Iodid. gr 3
Tinct. Ipecac. m 10
Syr Aurant q s
Aq ad 1/6 fl. oz.
Sig. t.d.s. p.c.

Progress Notes

4.1.46 The following day the patient appeared to be worse, and further investigation was instituted. T 102° F. Ronchi numerous in chest. Spleen not enlarged. Placed on sulphathiazole course: Gm 2, thereafter Gm 1 given four hourly till a dosage of 20 Gm had been taken. The expectorant mixture was continued. Diagnosis is now broncho-pneumonia.

5.1.46 T still up to 102°. Blood Sedimentation Rate (S.R.) 11 mm/hour. Haematocrit 43.
W.B.C. 38,000/c.mm, 26% Neutrophils, 60% eosinophils : 22,800/c.mm., 12% lymphocytes, 2% basophils.
No improvement. T 102° in the morning.
X Ray of chest. There are multiple infiltrations in all zones which are probably transient and allergic in character in view of the high eosinophilia. For re-examination in one week.

7.1.46 T falling by lysis since yesterday afternoon.

8.1.46 Urine. Heavy deposit of triple and amorphous phosphates.
Stool. Semi-Formed, no exudate. Ova of trichuriasis and trichomonas found. Sputum. Neither amoebae nor fungi were observed. Numerous pus cells,
75% of which were eosinophils; remainder were mononuclear and epithelial cells, very numerous mixed organisms, mainly Gram positive cocci in chains and pairs. M.T.B. negative.

T falling by lysis. Chest has still numerous crepitations as on 5.1.46. Sulphathiazole discontinued.

9.1.46:
Tonchi still present in lungs, crepitations disappearing rapidly. Nil present in abdomen.

T normal.

12.1.46:
T up to 99°F.

16.1.46:
X Ray of Chest. The multiple infiltrations have disappeared almost completely. There are still densities in both costo-phrenic angles. Slight pleural thickening is apparent in the periphery of the left lower zone.

Blood: W.B.C. 12,800/c.mm., 61% eosinophils: 7,708/c.mm., 18% Neutrophils, 19% lymphocytes, 2% monocytes.

17.1.46:
Stool. Trichuris ova present.

Cl. Chenopodium started.

21.1.46:
Feels well.

Stool. No parasites seen.

Blood: W.B.C. 9,200/c.mm.; 42% eosinophils: 5,884/c.mm.;

29.1.46:
Stool. No parasites, trichomonas.

W.B.C. 8,600/c.mm., 28% eosinophils: 2,354/c.mm.

Chest perfectly clear. No cough no pain. Feels very well.

30.1.46:
Discharged. Condition appears perfectly well.

Follow-up:
No record of eosinophil count after the patient left hospital.

Commentary:
A case of eosinophilia of lung with transitory eosinophilic infiltration. Cleared without specific treatment. Trichuriasis was not suspected as the cause for the eosinophil count of 22,800/c.mm. was very high. Trichuriasis is well known as an intractable infestation and it was felt the therapy would be only apparently successful. However the pulmonary condition may have been a phase in the life history of the parasite producing a marked allergic response.
Case 3

Age Unknown ? 40 years.
Town Tola
Admitted 21.8.45
Discharged 23.9.45
Diagnosis on Admission Bronchitis
Diagnosis on Discharge Eosinophilic infiltration of lungs.
Complaint Coughing for one week especially at night.

Previous History

He was employed at the Dagga mines in Johannesburg in 1939 for one year. Had not had any chest trouble or cough before in his life. No other illnesses that he could remember.

History of Present Illness

Has had a severe cough for the past week which started while living here in Durban. The cough was worse at night. There has been substernal pain of a burning character associated with it, which is more marked on coughing and during deep breathing. The sputum accompanying the cough is not blood-stained and is muco-purulent.

On Examination

General Appearance T 100, P 90, R 20. He looks ill and does not appear to be a fit type.
C.V.S. All cardiac sounds are soft and systolic in time — functional. Apex beat 5th space, 4" from mid-line. B.P. 125/75.
Respiratory System Equal movement both sides, palpation and V.F. not increased in either field. No dullness on percussion. Rales, moist and simulant ronchi present over the whole chest. Expirations are NOT prolonged.
Alimentary System Bowels regular and stools formed. No abdominal tenderness. Liver not enlarged.
Haemopoetic System Spleen not enlarged.
Blood film for malaria. Malaria smears negative.
Blood. W.B.C. 17,800/c.mm. neutrophils
Treatment

Stimulant expectorant mixture (see previous case for drugs).

Course of 20 Gms. of sulphathiazole.

Progress Notes

24.8.45 Stool. semi-formed with mucus, r.b.cs., trichomonas.


27.8.45 T 99.4°, improved in appearance and general condition. Examination of Respiratory System - same results as 21.8.45.

28.8.45 W. B. C. 12,500/c.mm. neutrophils 13%, eosinophils 68% : 8,500/c.mm. lymphocytes 19%.

29.8.45 Viewed by T.B. specialist who diagnosed eosinophilic infiltration of the lungs.

1.9.45 Improved.

2.9.45 Chest clearing no coughing.

3.9.45 Emetine gr. 1 daily for six days to treat possible amoebiasis.

11.9.45 W. B. C. 8,300/c.mm. neutrophils 27%, eosinophils 20% : 1,860/c.mm., large mononuclears 3%, lymphocytes 50%.


15.9.45 No complaints, feels very well.

17.9.45 R. B. C. 4,700,000/c.mm. Hb 105%

Colour Index (C.I.) 1.1

W. B. C. 6,200/c.mm. neutrophils 26%, eosinophils 12% : 544/c.mm., lymphocytes 62%.

23.9.45 Discharged as fit.

Condition on Discharge

No complaints, feels very well, no chest symptoms. Bowels regular.

Commentary

Similar case to that of no. 2. The cause was not ascertained.
There was a short lived pulmonary effect. Diagnosis from pulmonary T.B. was certain after the second X Ray picture. The eosinophilia was markedly improved on discharge. This may have been a hidden case of amoebiasis.
Case 4

Age 44
Town Adden, Transvaal.
Admitted 6.6.45
Discharged 9.7.45
Diagnosis on Admission Acute Bronchitis.
Diagnosis on Discharge Eosinophilic infiltration of lungs, and ascariasis.
Complaint Cough for one week.

Previous History

Was in hospital in Egypt for "kidney trouble" last year. Has never had a cough before. No other illnesses.

History of Present Illness

His cough commenced in Durban "last week" ago, and has been gradually getting worse especially at night, when he gets pain all over his chest at the sides and substernally, which is made worse by coughing and deep breathing. He finds some difficulty in breathing out. Sputum is not easily expectorated. He has not noticed anything else amiss. Has not lost weight recently. Had some marked night sweats over the last few months.

On Examination


Pharynx is slightly congested. C.V.S. Sounds closed. apex 5th space 3 1/2" from mid-line, regular rhythm.

Respiratory System. Even movement. Expiration prolonged on both sides. V.F. not increased, no dullness on percussion. Rales and ronchi scattered throughout. A few scattered crepitations at right base. Expiration prolonged.

Abdomen. Bowels regular, no abnormality of the stool noticed.
Liver not enlarged. No history of diarhhea.
Spleen not enlarged.
Treatment

Sedative expectorant mixture
Rx Potassium Citrate gr. 30
Potassium Iodide gr 3
Tinct. Ipecac. m 10
Tinct. Opii camphorat. m 20
Ag, ad 1/2 Fl. Oz.
Taken three times a day after meals.
Linctus scillae co. 2 drs. at night.
(B.P.C.)
Rest in bed with fresh air.

Progress Notes

27.6.45 Complaining of vague pains in the lumbar region. To have Tab. Codein Co. B.P. b.i.d.
28.6.45 Little change noted in the patient.
29.6.45 General appearance slightly improved. Is coughing a little less.
Chest still numerous râles and bronchi, but not so marked.
Urine. Scanty with epithelial cells.
Blood. Hb 102%. W.B.C. 9,200/c.mm., neutrophils 17%, eosinophils 58% : 5,336/c.mm., basophils 2%, lymphocytes 25%.
30.6.45 Sputum is T.B. negative. Pus cells in large numbers are present in the sputum. Eosinophils predominate the picture. No parasites. No elastic fibres. Eosinophils compose about 80% of all pus cells present.
X Ray of Chest. Multiple infiltrations in both lung fields are ill-defined and fluffy in appearance, and are consistent with transient eosinophilic lung.

3.7.45 Condition improving.
Stool No parasites seen.
4.7.45 Further improvement.
Treatment of ascariasis commenced, santonin gr 3 in the morning, calomel gr 2 at night, followed by magnesium sulphate oz 1 in the morning. Repeat on the following day.
Blood. W.B.C. 11,900/c.mm., neutrophils 19%, eosinophils 54% : 6,436/c.mm., basophils 1%, lymphocytes 26%.

7.7.45 Chest is clear.
X Ray confirmation - nil in chest.
Stool. No parasites.
No complaints feels well.
8.7.45 Stool No parasites.
Lungs clear, feels very well.
9.7.45 Discharged. No follow-up of eosinophilia possible as the man was posted outside the area.

Commentary

Similar type of case to Nos. 2 and 3. The ascariasis here would give an eosinophilia, the initial count was eosinophils 5,336/c.mm. during pulmonary symptoms, and after their subsidence it remained high to 6,436/c.mm. The ascariasis may well have been responsible for the "acute bronchitis", or eosinophilic infiltration of the lungs, as an allergic manifestation of the infestation during a phase of its life cycle.
Case 5

Age 40
Town Maritzburg.
Admitted 25.3.45
Discharged 4.4.45
Diagnosis on Admission Influenzal bronchiitis.
Diagnosis on Discharge Pneumonitis Ascariasis.
Complaint Cough and pain in his chest.

Previous History

Has not been in Hospital before. Cannot remember having any special illnesses. Bowels have if anything been constipated, never diarrhoeic.

History of Present Illness

He started coughing three days ago and felt toxic since then. The cough was worse at night and has kept him awake. He has had a substernal pain which has been aggravated by the coughing bouts.

On Examination

C.V.S. Sounds closed, apex 6th space 4" from mid-line. B.P. 136/85.
Respiratory System. Equal movement. V.F. not increased, breath sounds diminished at the base of the right lung. Scattered ronchi throughout both lung fields, especially at the right base. No dullness on percussion.
Alimentary and Abdomen Splen and liver not palpably enlarged. Nil else. No clinical evidence of dysfunction.
Other Systems Clinically n.a.d.

Treatment. As the diagnosis is acute bronchitis, and as there is a query of incipient broncho-pneumonia developing from the right base a course of sulpha thiazole Gm 20 was given, together with a sedative expectorant mixture (see previous case).
March 45 Condition is static.

29.3.45 Abdomen is distended. Lungs still have scattered râles. B.P. 138/82.

30.3.45 Hb 100%; R.B.C. 5,330,000/c.mm. W.B.C. 15,000/c.mm., neutrophils 24%, eosinophils 30%; 3,000/c.mm. lymphocytes 16%
Sputum. Negative for T.B.
X Ray of Chest. Loss of translucency, not of uniform density, is present in both lower zones. More extensive on the left than on the right. Costo-phrenic angles clear. Appearance is consistent with bilateral pneumonitis.

1.4.45 Sputum is negative for T.B.
Stool. Ascaris ova present.

4.4.45 Cough and pain much reduced.

5.4.45 Stools. Ascaris ova present.
Course of santonin, calomel and mag. sulph. commenced (see previous notes as to detail)

Blood. W.B.C. 9,600/c.mm. neutrophils 27%, eosinophils 31%; 4,896/c.mm. basophils 1%, large monocytes 1%, lymphocytes 20%.

7.4.45 Slight cough. Feeling better.

15.4.45 Chest clear clinically, feeling very well.

20.4.45 X Ray of chest - clear.

27.4.45 Stool. No parasites.

Blood. W.B.C. 9,400/c.mm., neutrophils 25%, eosinophils 33% : 3,102/c.mm., lymphocytes 42%.

4.5.45 Condition normal, chest clear. Feels very well. Discharged.

Commentary

A further case of pulmonary signs of eosinophilic infiltration in so-called pneumonitis, radiologically complicating a parasitic infestation. The eosinophilia was reduced somewhat after cessation of pulmonary symptoms and treatment of the ascariasis.
Case 6

Age 26
Town Maritzburg
Admitted 19.9.45
Discharged 10.10.45
Diagnosis on Admission Pulmonary tuberculosis
Diagnosis on Discharge Eosinophilic infiltration of lung.
Complaint Cough over long period.

Previous History

Was disabled in 1943 with pulmonary disease, and boarded out of the Army with pulmonary tuberculosis. Has been coughing off and on since 1943 with long periods of complete freedom from symptoms. He has according to his statements "coughed blood on many occasions". Has had a certain degree of dyspnoea since 1942, and lost weight to some extent in 1941. Details of this history are indefinite.

History of Present Illness

Coughing on this occasion commenced 16.9.45 and this time the man had no haemoptysis. He was also short of breath but had no pains.

On Examination

General Appearance T 100, P 88, R 24.
Asthmatic, ill-nourished, weedy type of individual. Does not look unduly toxic.
C.V.S. Sounds closed, not very clear. Apex 5th space, 3 1/2".
E.P. 130/80.
Respiratory System. Equal expansion.
No dullness on percussion. No bronchial breathing detected. Ronchi and râles over both lung fields. V.R. not increased.
Alimentary System Bowels regular, once daily. No history of diarrhoea. Liver not palpably enlarged.
Other Systems Clinically n.a.d.

Opinion Relapse of tuberculosis, treatment sedative linctus at night. Complete rest in the fresh air of the verandah and nutritious light dieting.
20.9.45 T has diurnal range of 97 - 100°. All previous records verified. No actual evidence of tuberculosis was ever recorded; the man has a marked tuberculous phobia, and as he was chronically ill at sick parades he was given the benefit of the doubt and discharged from the Army.

21.9.45 Clinically the condition appears more now in the nature of an asthmatic bronchitis. Placed on ephedrine gr 1/2 b.i.d. for ten days.

23.9.45 Feels much better, T has remained normal for the last two days. Sputum. No T.B. Fasting Gastric Juice. No T.B. X Ray of lungs. Infiltration of all zones of both lungs. No cavitation. Residual lipiodol present. Distribution of infiltration is not typical of tuberculosis. Stools. No parasites. Blood. W.B.C. 16,700/c.mm. neutrophils 33%; eosinophils 33% : 9,552/c.mm. lymphocytes 11%.


10.10.45 Feels quite well no complaints. Discharged.

Commentary

A case of Loffler's syndrome superimposed on a bronchial asthmatic and chronic bronchitic base. The latter appears to be the cause of the former and an allergic factor is claimed to be the initiating agent in this case.
Case 7

Age 29
Town Ventersburg
Admitted 17.4.45
Discharged 19.6.45 to Ladysmith Sanatorium

Diagnosis on Admission Amebiasis
Diagnosis on Discharge Pulmonary Tuberculosis

Complaint Pains in his chest.

Previous History

This soldier was in hospital in October '44 with a similar complaint of pain in the left side of his chest. He had then been unfit over a month or two that he could remember. The X Ray of his chest at the time was negative, and he was diagnosed as pleurodynia which cleared up after four weeks in hospital. Sputum had been T.B. negative. Cysts of amoeba histolytica were isolated from his stool on routine examination and he was treated for amebiasis.

History of Present Complaint

There has been pain on the right side of his chest on this occasion which has occurred on and off for the last four months. The pain when present is continuous and radiates into his interscapular area. It is aggravated by exercise and he has altogether very little relief from the pain. It is stabbing in character when he exercises, and is gnawing when not exercising. He does not complain of a cough. He says he has been losing weight, and he does not sleep well. He sweats most nights and he does not feel at all well.

On Examination

General Appearance T 100.5, P 96, R 20
A poorly nourished asthmatic looking individual. Looks older than the age he has deduced. He looks toxic.
C.V.S. Sounds closed though not loud, apex 5th space, 4".

Respiratory System - Diminished movement of right side. V.R. diminished right base. Percussion is impaired at right mid and base zones. Breath sounds throughout are vesicular with harsh quality at left apex. No crepitations heard. V.R. is impaired at right base.

Anterior
Impaired percussion
V.R.

Posterior
Impaired percussion and diminished Vocal Resonance.

Alimentary System
No liver enlargement, no tenderness.
Stool semi-formed occasionally but usually normal in consistency; no diarrhoea. Is of regular habit.

Other Systems
n.a.d.

Treatment

Rest in bed on open verandah; nourishing diet, tab. codein co. E.P. 2 t.d.s. to relieve pain in chest.

Investigation

Of stools for amoebiasis, blood estimation for eosinophilia, and X Ray of chest for signs of eosinophilic infiltration as this condition is a possible amoebiasis of lungs.

Progress Notes

18.4.45 Blood. R.B.C. 16 mm/hour, R.B.C. 4,880,000/c.mm. W.B.C. 7,300/c.mm. Neutrophils 33%, eosinophils 33% : 2,828/c.mm., Lymphocytes 27%.
The pain is relieved but his appetite remains poor. He required nembutal gr 3 to sleep last night.

19.4.45 Better this morning. Slept fairly well.
X Ray of Chest. Report from 19.4.45
"old diaphragmatic pleurisy right
base, shadows of left apex consistent
with pulmonary tuberculosis.

20.4.45
Stool. Pus cells scanty, no
parasites. No cysts of E.histolytica.
Evening rises of temperature to
100°.

22.4.45
Sputum. Negative for pulmonary
T.B.

28.4.45
Sputum. Negative for T.B.

1.5.45
W.R. negative.

5.45
Spunum. T.B. Positive
T 100.5° last night, T 100° this
morning.

5.45
T normal over the past four days,
except for an occasional flicker
to 99°.

5.45
Stool. Liquid, fair number of r.b.cs.
trichomonas present.

22.5.45
X Ray of chest. Right basal opacity
resolving. Left apex unchanged.
the appearance is not consistent
with a state of allergy, but is
more like a tubercular shadow.

1.6.45
Blood. B.S.R. 24. Hb 82%, R.B.C.
4,800,000/c.mm. W.B.C. 11,400/c.mm.,
neutrophils 52%, lymphocytes 32%,
ceosinophils 10% : 1,140/c.mm.
Stool. No parasites.

7.6.45
Transferred to Ladysmith Sanatorium.
Pulmonary tuberculosis still active.

Commentary.

This case was first regarded as
amoschiasis with lung complications
because previous hospitalisation
failed to demonstrate lung pathology
and ameobae were found in the stools.
The high eosinophils on this
occasion seemed to confirm this
opinion, but X Ray confirmation of
old pleurisy with an apical shadow
suggested a change of diagnosis.
Re-X Ray after being hospitalised
showed the apical shadow to be constant
and unlike the Leffler's syndrome
picture.
Tubercle bacilli morphologically and culturally shown, further confirmed the diagnosis of pulmonary T.B.

The eosinophilia was thought to be due to the amoebiasis recorded in the man's history, though amoebic cysts were not found in the stools. As I had carried out 10 differential counts on non-complicated proved tuberculosis cases without finding an eosinophilia among them, I felt certain that the eosinophilia in this case was not due to tuberculosis.
Case 8

Age 32
Town Kimberley
Admitted 10.8.45
Discharged 21.8.45
Diagnosis on Admission Amoebic Hepatitis
Diagnosis on Discharge Ascariasis

Complaint Pain in abdomen and cough.

Previous History

The patient had rheumatic fever in March '45 which left no cardiac impairment. After leaving hospital he had gonococcal urethritis in May '45, which cleared up with sulphathiazole treatment; then a secondary syphilitic rash appeared with a W.R. and Kahn positive. This was treated.

History of Present Complaint

He had abdominal pain commencing four days ago while he was here in Durban. The pain was burning in character and continued for several hours. It was irregular and unassociated with meals or with time during the day. The pain was situated generally but mainly around the umbilicus. There was no vomiting. He has had a cough without pain and without sputum for four days.

On Examination

General Appearance T 98, P 80, R 18.
Of average build, powerful musculature, not over intelligent. Not toxic in appearance and does not look acutely ill. No jaundice. C.V.S. Sounds closed and regular. Apex 5th space, 3 1/2". No evidence of rheumatic carditis. There is no clubbing of fingers.
Respiratory System Equal expansion
of both lungs, percussion notes unimpaired, breath sounds are vesicular in character with ronchi over both fields. No increase in V.R. Sputum is mucopurulent and not blood stained.

**Alimentary System** The abdominal wall is tender on palpation, but entirely without rigidity. Liver is tender but not enlarged.

Bowels open four times a day, with recently some blood in the stools, continuous over the past fortnight.

**Genito-Urinary System** No dysuria and no haematuria. No albumin, and no sugar.

**Haemopoietic System** No obvious pallor of conjunctivae, spleen is no enlarged. For blood investigation.

**Other Systems** n.a.d.

**Treatment** Stimulant expectorant to clear his cough, t.d.s. for five days. For further investigation of chest and stools.

**Progress Notes**

11.8.45 - Feels better. Slept well. Little cough this morning.
Stool. Ova of ascarsis present.
Blood. B.S.R. 3 mm./Hour. Hb 99% Haematocrit 50%. R.B.C. 5,200,000 /c.mm., G.I. 0.84. W.B.C. 8,400/c.mm.
Neutrophils 52%, eosinophils 9% : 872/c.mm.: monocytes 4%, lymphocytes 36%.

12.8.45 - Santonin commenced as for case "4".

14.8.45 - Passed twelve rounds worms during the last two days.
X Ray of Chest. Right dome of diaphragm is raised slightly. Lungs clear. No abnormality in lung fields.

20.8.45 - Blood. W.B.C. 8,1500/c.mm. eosinophils 4% : "28/c.mm.
Feels very well. There is now no cough. No diarrhoea, no abdominal pain or discomfort.
Stool. Formed no iecarites. Discharged as fit.
Commentary

A case of mild eosinophilia due to ascariasis, with lung symptoms but no radiological evidence at the time of X Ray.
Reduction of symptoms and lowering of eosinophilia with santonin therapy.
Case 9

Age 44
Town Johannesburg, Transvaal.
Admitted 5.10.45
Discharged 20.11.45

Diagnosis on Admission: Coronary Thrombosis and chronic bronchitis.

Diagnosis on Discharge: Bronchitis, amoebiasis and coronary thrombosis.

Complaint: Cough over a long period, and precordial pain for one day.

Previous History

Has had no serious illness that he can remember.

Has occasionally passed round worms.

History of Present Illness

He has complained of a cough off and on for four years. He was perfectly well until 1941 when he was posted to Durban, and here his cough commenced.

The cough was worse in the morning though it was never very troublesome. It always seemed to disappear when he went into the high veldt towards home. Since his return to Durban three months ago it recommenced with all its old vigour, and it bothers him quite considerably at night. It is persistently dry with no sputum except only during the last few weeks when it has been productive. The sputum has never been blood-stained. The cough is not accompanied by pain.

During last night the patient woke up with a pain over the precordium, continuous but not very severe. There was some numbness of both arms associated with the pain. He still has a tight discomfort over the precordium.

On Examination

General Condition: T 97, P 76, R 16.

The patient is fairly well built, slightly on the obese side.

No pallor, cyanosis, or jaundice.

C.V.S. Sounds indistinct but closed.

Apex 5th, 4" from mid line. Pulse
Electro-cardiograph

in case 9.

Altered T wave in lead III.
Coronary thrombosis.
is regular in time and force.
R. P. 134/90.

Respiratory System. Poor expansion generally, equal both sides. Percussion note is good, unimpaired in either field. Auscultation reveals vesicular breath sounds with ronchi over all areas, and specially at the bases of the lungs.

Alimentary System. Poor abdominal tone. No tenderness over the intestines.
Liver not tender or enlarged.
Bowel regular, sometimes semi-formed stools, and gives history of occasionally passing round worms.
Spleen not enlarged.

Other Systems n. a. d.

Treatment
Morphia gr 1/4 on admission.
Total rest for six weeks.
Sedative expectorant mixture with linutus at night.
Verandah bed, light dieting multivite tablets.

Investigation
Of heart, chest and stools.

Progress Notes

17.10.45 Electro-cardiograph (E.C.G.) Normal 1 and 2 leads, inverted T wave in lead 3 - coronary thrombosis.
Stools. Scanty R. h.cs., cysts of B. coli and E. histolytica and ova of trichuris present.
Blood. B.S.R. 15mm./hour. Hb 90%
R.B.C. 5,090,000/c. mm., W.B.C. 7,000/c. mm. Neutrophils 33%, eosinophils 29% : 2,030/c. mm., lymphocytes 38%.
X Ray of Chest. No shadows, no evidence of tuberculosis or of eosinophilic infiltrations.
C.V. shadow appears within normal limits.

8.10.45 E.N.T. specialist. "No E.N.T. pathology to account for his chronic bronchitis."
No recurrence of precordial pain or brachial discomfort.
To commence course of emetine gr 1 and carbasone 0.25 Gm ampoule daily for ten days.

11.10.45 Still has a cough with sputum.

18.10.45 Emetine and carbasone courses completed, but still has some cough.
Blood. W.B.C. 7,400/c. mm. Eosinophils
15% : 1,110/c.mm.
Stool. No parasites.
Sputum. No T.B. present.

18.11.45 Recovery uneventful. No further attack of coronary thrombosis or its complications.
Still has slight cough. No further improvement in respiratory symptoms.

20.11.45 Discharged and medically boarded to a lower category, to be employed in the Transvaal at high altitudes only.

Commentary.

This is a case of bronchitis due to climatic unsuitability. Parasitic and coronary diseases were coincidental and involving the clinical picture.

The eosinophilia was probably the result of parasitic invasion, but it may be associated with the condition being thus an expression of bronchitic allergy. However no opacities were demonstrated radiologically and as the thoracic symptoms showed no effective response to carbarsone therapy it was therefore felt that the pulmonary signs and parasitic infestation were disassociated.

There was no evidence to assume that the coronary thrombosis in any way altered the eosinophil count.
Case 10

Age 31
Town Korrmatiprot
Admitted 29.11.45
Discharged 11.12.45

Diagnosis on Admission Bronchitis
Diagnosis on Discharge Acute Bronchitis Ascariasis.

Complaint Cough and thoracic pain.

Previous History

No similar attacks before.
No serious illnesses.
He could not remember having had any illnesses apart from "pain in the chest" some years before.

History of Present Illness

Four days ago, at Clairwood Camp in Durban he developed a cough with substernal pain. The cough is hacking in character, and it is becoming worse. There is no special periodicity. It is productive - a muco-purulent sputum and the patient thinks it has been blood-stained on one or two occasions.

On Examination

General Appearance T 98.7°, P 90, R 24. Nutrition is good, well built adult, not very toxic in appearance.
C.V.S. Sounds closed, regular in time and force. Apex 5th, 3 1/2".
B.P. 130/90.
Respiratory System. Equal expansion of both lungs, V.F. not diminished. No impairment of percussion. Breath sounds are vesicular with moist râles and ronchi over all fields.
Alimentary System Bowels regular. No diarrhoea. Liver not enlarged.
Other Systems n.a.d.

Treatment Stimulant expectorant mixture given to increase expectoration.
Linctus codein dr. 2 at night.
Rest in bed. Light diet.

Progress Notes
29.11.45 No improvement.
30.11.45 Much better. Râles still present over both lungs but no ronchi today.
X Ray of Chest. Old diaphragmatic pleurisy shown. Otherwise N.A.D.
Sputum. No tubercle bacilli present.
1.12.45 Chest fields clear though cough still occasionally present, and still has a watery sputum. No râles now heard.
Stools. Bounty. Ova of ascaris present.
Blood. S.S.R. 5mm./hour. R.B.C. 4,830,000/c.mm. C.I. 0.86
W.B.C. 15,000/c.mm. Neutrophils 55%; eosinophils 14%; 1,952/c.mm.
monocytes 5%; lymphocytes 25%. Urine. Few pus cells present. Nil else.
2.12.45 Cough less productive, expectorant mixture stopped. Sandozin course commenced.
10.12.45 Lung fields clear. Round worms have been passed.
Stool. No parasites.
W.B.C. 9,100/c.mm. Eosinophils 8% : 783/c.mm.
11.12.45 Discharged as fit for duty.

Commentary

It is felt that the pulmonary signs and symptoms were associated with the ascaris infestation, but there is no actual evidence to show that this was so. The bronchitis may have been an independent disease and hospitalisation uncovered the coincident intestinal affection.
Case 11

Age 25
Town Ngatu
Admitted 18.10.45
Discharged 11.12.45
Diagnosis on Admission Haemoptysis
Diagnosis on Discharge Ascariasis

Complaint Pain in chest with some coughing.

Previous History

No serious illnesses. Has not worked in the gold or diamond mines. Has not had this complaint before. No history of tuberculosis in his family.

History of Present Illness

There is nothing very clear in this soldier's history. It appears that for two weeks while in Durban he has had a cough, which is getting worse and is most troublesome at night. He also has an associated substernal pain when coughing and on deep breathing. A non- copious mucopurulent sputum is brought up with the cough. During this last week the sputum has frequently been blood-stained. He thinks he has lost a slight degree of weight.

On Examination

General Appearance. T 99, P 80, R 21. Reasonably well built, appears young and not a phthisical type. No pallor, cyanosis or jaundice. Is not coughing during the examination.
C.H.S. Sounds closed and regular. Apex 5th space, 3 1/2". E.P. 126/84.
Respiratory System. Equal expansion of both lungs on inspection, confirmed by palpation. V.R. not increased, percussion notes are unimpaired. Breath sounds are vesicular with scattered ronchi. V.R. not increased.
Spleen not enlarged.
Other Systems n.a.d.

Treatment
Sedative expectorant mixture for "bronchitis".

Investigation
Of lungs and stools required.

Progress Notes

19.10.45 Urine. n.a.d.
19.10.45 Stool. Ova of ascaris and cysts of T. Histolytica found.
20.10.45 Emetine gr 1 daily for ten days. Carbarsone ampoules 0.25 Cm b.i.d. for ten days.
23.10.45 Stool. Ova ascaris present. For carbon tetrachloride course. Blood. Hb 90%. W.B.C. 4,000/c.mm. Neutrophils 18%, lymphocytes 43%, large mononuclears 1/3%: eosinophils 32%: 1,280/c.mm.
23.10.45 X Ray of chest. Changes seen at both bases, some thickening off the pleura.
30.10.45 Sputum. No T.B. present. Stool. No parasites seen.
2.11.45 Chest very much improved. Occasional ronchi heard.
9.11.45 Slight pain across chest.
12.11.45 Blood. Hb 90%. W.B.C. 7,400/c.mm. Neutrophils 22%: Lymphocytes 44%. Eosinophils 34%: 2,516/c.mm.
13.11.45 Patient's condition has now been static since 5.11.45. Still coughing slightly. Sputum. T.B. Negative.
24.11.45 Emetine gr 1 daily for six days. Stovarsol tabs. 1 b.i.d. for six days.
No complaints, chest clear. Clinically the man is quite fit.

11.12.45 Discharged as fit for duty.

Commentary

A case of parasitic infestation with amoebae and ascaris, complicated by bronchitis.

The parasites were the cause of the eosinophilia and the bronchitis may be associated, but this is unlikely as repeated X-ray films failed to show any infiltration of the lungs with eosinophils.
Case 12

Age 52  
Town Pretoria, Transvaal  
Admitted 9.9.45  
Discharged 29.9.45  
Diagnosis on Admission Ascariasis  
Diagnosis on Discharge Ascariasis  
Bronchitis  
Complaint Cough and pain in his chest and abdomen.

Previous History

He has never been to a hospital before and to his knowledge has always been fit. He has not had diarrhoea but his stools are sometimes semi-formed. He has never served in the mines.

History of Present Illness

He was posted to Durban two months ago, when he felt quite well. Three weeks ago he became ill. About two days after the onset he began to cough and this has gradually become worse so that the past five days have been very trying. Associated with the cough is a sharp pain, situated sub-sternally which was more marked when he coughed. He has been expectorating a thick mucoid sputum.

He also complains of a colicky pain all over his abdomen which is moderately severe in intensity. This pain he has had on and off for the last three weeks. His bowels have been rather loose over this period of malaise and he has been having about two motions each day. There has been no blood or mucus to his knowledge.

He noticed he passed a round worm in a stool 16 days ago.

He says he has been having slight night sweats recently (for about two weeks).

On Examination

General Appearance T 100.4°, P 86, R 24  
An elderly male, moderately robust. Is not asthmatical but is coughing severely. No cyanosis

Respiratory System Expansion is equal but not very good - 1 1/2". Percussion note is equal over both pulmonary fields, with a deep note. Breath sounds on auscultation are harsh vesicular, not too clear in quality, accompanied by moist rales over both bases.

Alimentary System. Colicky pains are present. Abdominal tone is good. There is some slight tenderness over both iliac fossae. There is also some slight tenderness over the liver, which is not palpably enlarged.

Other Systems n.a.d.

Treatment
Treat the bronchitis by rest in bed, a stimulant expectorant mixture (as detailed already), linctus at night to prevent sleeplessness with coughing. A light nourishing diet.

Investigation To ascertain if round worms are the cause of his illness.

Progress Notes

10.9.45 Condition is static. Coughing severe. Did not sleep well last night. To have menthol inhalations one hour before sleeping at night. T 100.2°, P 94, R 22.

Stool. Occasional pus cells, few r. b. c., numerous ascaris ova.

Vermifuge course of santonin commenced.

11.9.45 Condition is slightly improved. Still coughing a great deal.
T 99.6°, P 82, R 26.

Passed a large number of round worms today.

12.9.45 Feels much better. T 98.8°, P 78, R 20.

Still is coughing, though without undue discomfort. B.P. 135/90.

Blood. W.B.C. 12,200/c.mm. Neutrophils 42%, eosinophils 2%, lymphocytes 34%

X Ray of Chest. Emphasis of the bronchial markings of both mid zones. Bilateral basal emphysema present.

14.9.45 No more worms passed. Is feeling much better and coughing is
considerably less today.
T 97.5°, P 74.
Stop expectorant mixture.

19.9.45
W.E.C. 10,900/c.mm. Neutrophils 47%, eosinophils 16% : 1,902/c.mm.
large monocytes 4%, lymphocytes 31%.
Repeat course of santonin.

22.9.45
No more worms were passed.
W.E.C. 9,400/c.mm. Neutrophils 52%, eosinophils 12% : 1,128/c.mm.
large monocytes 3%, lymphocytes 23%.

29.9.45
W.E.C. 8,150/c.mm. Eosinophils 7% : 568/c.mm.

No pulmonary signs, no complaints.
X ray of chest. Lung fields are clear, the emphasised striations at mid zone are now absent. Basal emphysema present.
Discharged as fit for light duty.

Commentary

This man illustrates another case of eosinophilia caused by ascariasis. The eosinophilia was high for an intestinal infection and it was felt that the high level was due to a pulmonary phase of the ascaris life cycle infestation, though there is no strong evidence other than the high eosinophilia before and after treatment, coupled with the mid zone striations in the X Ray picture. It is to be remembered that the man was ill for three weeks before admission. Had it been available an X ray of his lungs during the height of his coughing and malaise would have been interesting. It is possible a denser lung opacity would have been demonstrated of the Loffler's syndrome type.
Case 13

Age 32
Town Kimberley
Admitted 22.5.45
Discharged 27.6.45

Diagnosis on Admission: Influenza.
Diagnosis on Discharge: Left basal pneumonia
Ascariasis.

Complaint: Coughing and pain in his chest for two days.

Previous History

Not previously hospitalised. No previous illnesses of a serious nature; has always been very fit. Worked in the Kimberley diamond mines. Bowels have always been regular. There is no history of diarrhoea.

History of Present Illness

Two days ago in Durban his cough started. It is getting worse and he is not sleeping well at night. This was followed by generalised pains and a frontal headache. He complains of dyspnoea at night time.

On Examination

General Appearance. T 102.6°, P 104, R 28. Young well nourished adult. He looks ill, his breathing is rather rapid and he is coughing during examination. The cough is harsh and unproductive. He has herpes labialis.

There is no sign of anaemia or jaundice. No clubbing of fingers. C.V.S. Sounds in all areas with soft blowing systolic murmurs, which are not propagated. Apex 5th space, 4" from mid line. Regular rhythm. B/P 125/72.

Respiratory System. Expansion appears to be equal. There is no pleuritic pain on expansion. Percussion note is duller over the left base posteriorly. The breath sounds are vesicular over the lung fields, except over the left base, where is bronchial breathing is discernable with fine
Opinion

crepitations at the height of inspiration. Over the apices and mid zones there is some wheezing with a slight prolonging of expiration. There are scattered râles and ronchi throughout.

Alimentary System. No diarrhoea or vomiting. Liver is not enlarged. Bowels are regular and the stool formed. There is no abdominal tenderness.

Other Systems n.a.d.

Basal lobar pneumonia, and treatment accordingly decided: course of sulphathiazole. Gm 20, to be given four hourly over four days.

Syrup Codein Phosph. given as a linctus - dr 2 four hourly.

Pot. Brom and Chloral Hydrate of each gr 20 b.i.d. given as a sedative for three days.

Antiphlogistine to left chest and base, to be changed when cool and at most four hourly. Three days.

To rest in bed with nourishing diet, avoiding food containing sulphur, and with a controlled intake of copious fluids, at least 6 pints per diem.

Progress Notes

22.5.45 T 103.2 this p.m.
23.5.45 T 99°, P 100; R 28.
Still very ill and is coughing considerably with little sputum. No cyanosis.
On examination signs of dense lobar pneumonia at the left base.

24.5.45 Some improvement in the condition.
Little coughing, there is some slight pain on the left of the thorax.

Blood. W.B.C. 16,800/c.mm. Neutrophils 30%, eosinophils 52% : 8,736/c.mm. large mononuclears 3% ; lymphocytes 13%.

Urine. No r.b.c.s., no bilharzia.
Stool. No parasites seen.
Sputum. No tubercle bacilli seen.

25.5.45 Improvement is now marked.
T 98, P 90, R 18. On percussion and auscultation some signs of the resolution of the lobar pneumonia are seen.

Blood. Hb 94% : W.B.C. 24,700/c.mm.
Neutrophils 55
Neutrophils 26%, eosinophils 58% : 14,326/c.mm.
Stool. Formed, mucus present, ova of ascaris seen.
X Ray of chest. Slight loss of translucency right lower zone where there are some mottled densities present. In the left lung at the level of the 4th to 5th ribs are present the typical appearances of consolidation. The general appearance is consistent with a broncho-pneumonia which is more extensive on the left than on the right.

26.5.45 Signs of consolidation much the same clinically. Sulphathiazole stopped.

29.5.45 Stool. Semi-formed with mucus strings and pus cells.

31.5.45 The soldier is feeling much better. He is afebrile. Sputum is much reduced in quantity. It is white and mucoid. Chest on auscultation is clear in both lungs, except for a few coarse crepitations at the left base.

2.6.45 Stool. Formed with mucus strings and pus cells. Ova of ascaris present.

3.6.45 Santonin course commenced.

Blood. W.B.C. 8,700/c.mm. Neutrophils 40%, eosinophils 10% : 870/c.mm. large monocytes 6%, lymphocytes 41%.

4.6.45 X Ray of Chest. Both lung fields are quite clear of all signs of consolidation. Normal translucency.

3.6.45 The patient passed worms during the 4th and 5th June. No further worms passed.

11.6.45 No further complaints, chest quite clear.

12.6.45 Patient has some pharyngitis. No rise in temperature. Gargles with pot. chlor.

13.6.45 Stool. No parasites present.

17.6.45 Patient is feeling much improved but somewhat weak.

20.6.45 Convalescing well.

W.B.C. 7,800/c.mm. Neutrophils 45%, eosinophils 5% : 468/c.mm. large monocytes 5%, lymphocytes 46%.

26.6.45 The patient is fit. Discharged.
A case of eosinophilia associated with pneumonia and ascariasis. The eosinophilia was high during the pyrexial phase and was lowered when the pneumonia was controlled in spite of no vermifuge treatment. The vermifuge therapy when instituted lowered the eosinophilia still further.

Whether the XRay mottlings at the right side of the chest were associated with the ascariasis, and whether the latter had a direct association with the lobar pneumonia it is impossible to assess.
Case 14

Age 29
Town Durban
Admitted 19.7.45
Discharged 27.8.45
Diagnosis on Admission Amoebic dysentery
Diagnosis on Discharge Amoebiasis

Complaint Diarrhoea and abdominal pain

Previous History

He was previously in hospital 17.12.44 with ascariasis associated with eosinophilia. The worms were treated successfully with santonin and calomel vermicide.
He cannot remember having any other illnesses.

History of Present Illness

About five weeks ago while in Durban, he commenced to have colicky pains in his abdomen, situated around the umbilicus. These were not severe and were not generalised. He has had diarrhoea during this period, evacuating his bowel about nine times a day.

During the last eight or nine days his symptoms have become more marked. He has been feeling nauseated. He has generalised aches and pains over his body without any specific distribution; he has a frontal headache.
He is not coughing, has no thoracic pain, is not spitting up phlegm and is breathing without difficulty.

On Examination

General Appearance T 98, P 80, R 20.
A young man who appears fairly fit.
Not apparently toxic, no pallor of his conjunctivae, no cyanosis.
C.V.S. Sounds closed. Apex 5th space, 3 1/2". Regular rhythm.
E.P. 120/32.
Respiratory System Equal expansion, percussion unimpaired. Breath sounds vesicular. No increased V.R., no adventitious sounds.
C.N.S. Reflexes normal and equal.
Alimentary System Tenderness on palpation of both iliac fossae.
Liver is not enlarged nor is it tender.

**Other Systems** n.a.d.

**Treatment**
A provisional diagnosis of amoebic dysentery made; sodium sulphate mixture given four hourly; rest in bed; light diet with plenty of fluids and no roughage.

**Progress Notes**

20.7.45 Stool. Semi-formed, pus cells and mucuc strings present but no parasites.

23.7.45 Still diarrheic, is feeling better.

25.7.45 Stool. Liquid with blood present. There are numerous pus and red cells, free forms of entamoebae histolytica.

24.7.45 Emetine gr. l and carbarsone ampoules 0.25 Gm daily for ten days.

26.7.45 Is improved. Bowels acting once per day. No blood or mucus in the stool. No abdominal pain and no colic.

Has now commenced to have quite a severe cough. He finds the cough is interfering with his sleep at night. Sputum is muco-purulent but not blood stained. T 100, P 84, R 24. Pulmonary examination reveals equal expansion, slightly prolonged expiration and slight dullness over both fields on percussion. Breath sounds are vesicular with numerous ronchi over both sides. To have menthol steam inhalations twice daily, also a stimulant expectorant, t.d.s.

**Blood**
- W.B.C. 11,500/c.mm neutrophils 60%: eosinophils 10% : 1,150/c.mm.
- large monocytes 7%, lymphocytes 23%.

27.7.45 X Ray of chest. Numerous areas of infiltration particularly infraclavicular. Smaller and less well defined mottlings in other zones. Appearance is very suggestive of pulmonary tuberculosis.

**Sputum** Negative for T.B., culture and guinea pig inoculation.

**Blood** W.B.C. 9,600/c.mm.
Neutrophils 52%, Eosinophils 16% : 1,556/c.mm. lymphocytes 32%.
T still swinging from 99.5° to 100.8° daily.

29.7.45
Slight improvement, is not coughing so persistently. Chest clear of signs, is now apyrexial.

30.7.45
Sputum. Negative to T.B. and amoebae.

31.7.45
ditte.

3.8.45
Emitting course completed. Much improved. Auscultation of the chest - a few ronchi are occasionally heard, nil else.
Stool. Semi-liquid, contains mucus and pus cells, and ascaris ova.

4.8.45
Santonin and calomel course.

5.8.45
Has passed five round worms.
W.B.C. 8,800/c.mm. Neutrophils 35% eosinophils 36% : 3,168/c.mm.
large monocytes 1%, lymphocytes 28%.

7.8.45
Lungs clear clinically. No complaints.
X Ray of chest. The multiple infiltrations have completely disappeared. Both fields are practically clear. In view of the rapid disappearance of the opacities this cannot be a case of tuberculosis.

10.8.45
Stool. Ova of ascaris present.
No complaints. Feels much improved.

12.8.45
Stool semi-formed, occasional pus cells, cysts of E. histolytica present.

13.8.45
Yatren 1%, 8 oz. enemas nightly for six nights.

20.8.45
Stool. No parasites.

23.8.45
X Ray of chest. Normal lung translucency, no shadows, a normal picture.

26.8.45
Blood. W.B.C. 8,150/c.mm. neutrophils 48%, eosinophils 12% : 973/c.mm.
large monocytes 1%, lymphocytes 39%.

27.8.45
Discharged as fit.

Commentary
Eosinophilia is evident here in an old standing ascariasis infestation, aggravated by amoebiasis with transient pulmonary infiltration. It is difficult to assess here if the lung changes were due to ascariasis or to the amoebiasis, but it is presumed that it may due to the former.
Case 15

Age 42
Town Sekukuniland
Admitted 29.8.45
Discharged 11.10.45 to Ladysmith Sanatorium

Diagnosis on Admission Influenza
Diagnosis on Discharge Pulmonary tuberculosis

Complaint Cough and pain in his chest.

Previous History
Has always been healthy
till the last three weeks.
He has had no illnesses that
he can remember. No history
of coughing.

History of Present Illness
Six days ago he felt a pain
in his chest which came on with his
cough, and with the taking of deep
breaths. The pain was a niggly
stabbing kind which made him
afraid to cough.
He only had the cough for
a week or ten days, it had
troubled him since the pain came
on and its character is dry and
irritating.
He has not had anything
wrong with his urine and his bowels
are acting normally.

On examination.

General Appearance  T 100.6°, P 88, R 26.
A well built adult of slightly
toxic appearance; some pallor of
the conjunctivae, no jaundice.
C.V.S. Sounds closed except at mitral
area. Apical systolic, not propagated
to the axilla. Regular rhythm.
B.P. 150/60.
Respiratory System. Diminished
expansion of right side of chest
with some dullness on percussion.
V.F. not increased either side.
Breath sounds are broncho-vesicular
at the right mid zone with many
fine crepitations. There is a
pleural rub over the right middle
lobe of the lungs.
Alimentary System Liver not enlarged.
Nil abnormal found.
Other Systems N.A.D.
Treatment

Rest in bed with a back support on the verandah. A good nourishing diet. Syrup Codein phosphate 2 dr to control the coughing and relieve the pleurodynia. Course of sulphathiazole Gm 20, four hourly over the next four days, to treat the diagnosed pneumonia.

Progress Notes

2. 9. 45 Some slow improvement. Sulphathiazole course finished. Steools. Ova of ascaris were present in the specimen.

8.9.45

There is no response to the sulphathiazole. Coughing is somewhat improved and the man looks less toxic but his pulmonary signs are unchanged. The pleurodynia has now stopped, and there is some increase of the area of dullness on the right side of the chest with diminished breath sounds. ? effusion. Blood. W.B.C. 6,400/c.mm. neutrophils 53%: eosinophils 18% - 1,152/c.mm., large monocytes 4% : lymphocytes 25%. X Ray of Chest. The right dome of the diaphragm is not elevated. There is some loss of translucency of the right middle zone suggestive too of a cavity, with some slight mottling of the right lower zone. Pleural thickening of both fissures of the right lung. The picture is suggestive of tuberculosis with cavitation.


16.9.45 Sputum. T.B. negative. T 100.4°F.

17.9.45 Sputum. T.B. negative.

19.9.45 Sputum. T.B. positive T 98.8°.

6.10.45 No improvement. Transferred to Ladysmith Sanatorium.
This case of eosinophilia has an ascaris background and an immediate pulmonary tuberculosis complicating the picture.

It is felt here that the ascaris is the responsible factor for the alteration in the eosinophil concentration, and that the tuberculosis had not any direct effect in altering the eosinophil blood picture.
Case 16

Age 33
Town Ladysmith
Admitted 7.10.45
Discharged 28.10.45
Diagnosis on Admission Bilharziasis
Diagnosis on Discharge Ascariasis

Complaint Pain on micturition.

Previous History

The patient gives a previous history of bilharzia infection. He was treated before entry into the Native Military Corps at Maritzburg from November '41 to February '42. He states that he there had 38 "special" injections and that "the doctors were very pleased with his recovery".

He has occasionally had loose motions but not acute diarrhoea.

History of Present Illness

He had dysuria for the first time since 1942 one week ago at Congella. The pain came on just before micturition. He did not notice any blood passed in his urine though he was on the look out for haematuria. He has had no rigors. His appetite is good. He does not complain of his bowel action.

On Examination

General Appearance T 97.8°, P 80, R 20.
A well built male who does not appear to be in pain and who does not look ill.

There is no evidence of anaemia, jaundice and no clubbing of the fingers.

C.V.S. Apex 5th space 4", sounds closed and regular. B.P. 140/84.
Respiratory System No cough or sputum. Good expansion, no dullness on percussion. Breath sounds vesicular without adventitious accompaniments. V.R. equal both lung fields.

Alimentary System Liver not enlarged, abdomen is not tender.
over the bladder or elsewhere. There is no hyperperistalsis of the bowel.

C.N.S. Reflexes equal and present.

Genito-Urinary System. No sugar, albumin or blood in the specimen of urine. For investigation.

Other Systems n.a.d.

Treatment Hospitalised for investigation. Nil specific at once except at least 6 pint fluid intake daily.

Progress Notes

8.10.45 Slept well last night. No loss of appetite. Stool was semi-formed and bowels moved twice yesterday. Urine. No albumin, blood or sugar present. Says he is not having any pain now.


Blood. R.B.C. 5,400,000, Hb 100% W.B.C. 8,150/c.mm. Neutrophils 57% eosinophils 12% : 973/c.mm. large monocytes 2%, lymphocytes 29%. Prostatic and Urethral smears - negative for gonococci.

10.10.45 Blood W.R. Negative. Is still not complaining. It is felt his dysuria was due to urinary calculi which must have been passed on day of admission.

11.10.45 Intra Venous Pyelogram. No calculi, and excretion was normal at both renal pelves. There is no apparent pathological change in the urinary tract, and no evidence of urethral obstruction. There may be a small calculus in the pelvis of the right kidney.

12.10.45 Cystoscopic Examination. There is no apparent pathology of the bladder mucosa, the ureteral orifices are not sclerosed.

13.10.45 Santonin and calomel course commenced.

14.10.45 Several round worms passed, feels very well.

15.10.45 Emetine-Bismuth-Iodide gr 3 nightly for ten nights to treat the amoebic dysentery; together
with retention enemas of yatren 2.5% solution 8 oz given each morning daily for ten days.


26.10.45 Stool. No parasites present.
27.10.45 ditto
28.10.45 Discharged as fit for duty.

Commentary.

The eosinophilia was not marked in this case but was definitely present. It may have been due to any one of three factors:
- Bilharzia, ascariasis or amoebiasis.
- The first was ruled out by urinary, cystoscopic and renal I.V.P. investigations.
- The last two were evident in the stool though they were apparently symptomless. The eosinophilia was reduced prior to discharge following treatment of the infestations.
Case 17:

Age 30
Town Maritzburg
Admitted 12.9.45
Discharged 8.12.45
Diagnosis on Admission: Amoebiasis
Diagnosis on Discharge: Amoebic dysentery, Ascariasis and liver abscess.
Complaint Loss of weight, headaches and diarrhoea.

Previous History

Was treated for syphilis in Maritzburg in 1933. Treated for head injuries in Egypt in April 45. No other serious illnesses.

Has not usually had diarrhoea though his stools are sometimes semi-formed.

History of Present Illness

Has had intermittent diarrhoea for about six days, melena has also been present and as bright red blood.

He has been having frontal and occipital headaches more or or less constantly for about two or three weeks, and he has recently been losing weight.

On Examination

General Appearance T 108.2°, P 74, R18.
A tall thin individual who is rather quiet. No obvious malaise.
C.V.S. Sounds closed, regular, apex 5th space, 3 1/2". B.P. 130/75.
Respiratory System There is impaired expansion at the base on the right side. Hepatic dullness extends one inch up. Breath sounds are vesicular and no adventitious sounds heard.
Alimentary System. Tender over 8th to 12 ribs on right side extending anteriorly. Liver appears to be one inch enlarged and is tender on palpation.
Proctoscopy. Mucosa is not hyperaemic. There are a few pin-point submucous haemorrhages. No excess mucus. No haemorrhoids.
Other Systems n.a.d.
Investigation of liver and alimentary tract bacteriologically.

Progress Notes

14.9.45  T 102° Blood smears negative for malaria. Four bowel motions today.

Blood. E.S.R. 20mm/hour. R.B.C. 3,200,000/c.mm. C.I. 0.7
W.B.C. 9,700/c.mm. Neutrophils 74%, eosinophils 5% : 485/c.mm.
basophils 1%, large monocytes 5%, lymphocytes 5%.

Blood Film. No parasites detected. Stool. Fluid, r.b.c.s. in abundance with mucus. No parasites seen.

15.9.45  T 100°

Stool. Vegetative forms of E. histolytica with blood and mucus present.

Emetine-Bismuth-Iodide course commenced.

16.9.45  T is settling.

17.9.45  T is normal with an occasional flicker to 99.8°

X Ray of Chest. Cardio-vascular shadow is normal. Lungs - no evidence of tuberculosis. Right dome of diaphragm is 1 and 3/4" above the left, with diminished movement under the screen suggesting upward enlargement of the liver.

18.9.45  Stool. Liquid with quantities of blood and pus. Vegetative forms of E. histolytica, and ova of ascaris are present. Culture - b. asciticius were isolated.

21.9.45  T running intermittently from 98.6 to 99.6°. Diagnosis of amoebic dysentery with hepatic abscess, complicated by ascariasis.

27.9.45  T normal during the whole of today; the man says he feels much better.

1.10.45  T is still normal. Allowed up.

2.10.45  Santonin course of gr 3 with calomel gr 3 nightly for two days started. Followed each morning with mag. sulph. 1/2 oz.

9.10.45  has passed many round worms.


12.10.45  Blood. E.S.R. 17/hour. Hb 74%
W.B.C. 10,300/c.mm. Neutrophils 60%, eosinophils 3% : 309/c.mm., large monocytes 5%, lymphocytes 33%.

15.10.45  Feels very well. Repeat ten day course of E.B.I.

25.10.45  Liver on palpation and percussion
can now be regarded as of normal dimensions. The man is gaining weight.

31.10.45
Blood. B.S.R. 4mm/hour. Hb 74% W.B.C. 6,500/c.mm. Neutrophils 66%, eosinophils 7% :455/c.mm. lymphocytes 24%, large monocytes 3%.

6 to 8 Acute pyrexia for 48 hours

11.11.45 to 103°. Intercurrent influenza.
Blood. B.S.R. 31mm/hour. W.B.C. 10,850/c.mm. neutrophils 67%, eosinophils 10% : 1,065/c.mm. monocytes 7%, lymphocytes 16%.
X Ray of chest. Movement of the right dome of the diaphragm diminished under the screen, the right dome is two inches above the left on deep inspiration.

12.11.45 Emetine hydrochloride gr 1 daily for ten days; as a third attempt to control the amoebeae and reduce the liver enlargement.

19.11.45 T is normal no symptoms.

3.12.45 The man feels very well.
Liver dimensions are not greatly reduced.
Stools. Formed, no exudate, no parasites.
Blood. B.S.R. 7mm/hour. Hb 82% W.B.C. 9,150/c.mm. Neutrophils 61% eosinophils 14% : 1,275/c.mm. monocytes 4%, lymphocytes 21%.


5.12.45 Stool. No parasites.

6.12.45 Fit for discharge.
Although no parasites were found in the stool and he is gaining weight, nevertheless he must be watched for symptoms of amoebic hepatitis. In category "C" for light duties.

Commentary

The eosinophilia in this case is not marked. It is within normal limits at the acute stages of the man's illness, and only appears during his convalescence. This may be significant, especially as he had ascariasis and amoebic infestation. The raised eosinophil count on the man's discharge from hospital was no doubt due to the amoebic hepatitis as the ascariasis was cured at a much earlier date.
Case 13

Age 35
Town Barbistoon
Admitted 22.9.45
Discharged 20.10.45

Diagnosis on Admission Bronchitis
Diagnosis on Discharge Amoebiasis
Ascariasis

Complaint Coughing and pain in his chest.

Previous History

There is no history of major illnesses. He has not had a similar attack before, and is not subject to attacks of diarrhoea.

History of Present Illness

About six days ago he commenced to have a cough which soon became worse, giving him substernal pain and productive of non-blood-stained sputum.
He has not had any night sweats but thinks he has lost weight during the last few months.

On Examination.

The man does not look unduly toxic but he is poorly nourished and he appears to have lost weight. He is very haggard.
He is of average build, without pallor or cyanosis, coughing a little during examination.
C.V.S. Sounds closed, regular, apex beat 5th space 3 1/2". B.P. 124/80.
Respiratory System. Equal expansion and no reduction of the percussion note. There are vesicular breath sounds with scattered moist râles, and ronchi throughout.
Alimentary System. No liver enlargement. No abdominal tender-ness. Bowels regular 1-2 per day.
Other Systems n.a.d.

Investigation Of lungs, alimentary canal and blood.

Treatment Rest in bed. Good nourishing
diet, and stimulant expectorant mixture. Linctus codein at night to prevent cough.

Progress Notes

22.9.46 Steel. Semi-formed, with scanty r.b.c.s. Ova ascaris, cysts of E. coli, E. histolytica, and trichomonas intestinalis. Sputum. 80% polymorpha, 15% eosinophils, remainder of white cells are mononuclears. Mixed organisms present.

23.9.46 Emetine gr i.m.i. daily for 10 days to control the amoebic dysentery, with ampoules of carbarsone 0.25 Gm b.i.d. p.o. over the same period.

28.9.45 T not quite settled. Feels much better.

Blood. Hb 103%, R.B.C. 4,930,000, C.I. 1.08. W.B.C. 5,800/c.mm.
Neutrophils 32%, eosinophils 35% : 2,030/c.mm., large mononuclears 1%, lymphocytes 32%.

29.9.45 Sputum. No T.B.

30.9.45 Sputum. No T.B.
T is still unsettled.

5.10.45 X Ray of chest. Right costo-phrenic angle partially obscured due to apparent pleural thickening. No pathological change in lung fields.

Stool. Ova of ascaris present.

6.10.45 Steel. Ascaris ova and scanty cysts of E. Histolytica observed.
New course of emetine-bismuth-iodide grs 3 nocte for 10 nights, given in an attempt to control the amoebiasis.

16.10.45 Feels very well. Santonin grs 3 with calomel grs 3 given for two nights followed each morning with Mag sulph. 1/2 oz. to control the ascariasis.

17.10.45 Passed round worms.

18.10.45 Steel. No parasites present. T is now quite settled.

19.10.45 Steel. No parasites present.

ditto

Blood. W.B.C. 7,310/c.mm. Neutrophils 39%, eosinophils 24% : 1,752/c.mm. monocytes 5%, lymphocytes 32%.
Discharged as he was fit for duty.
No complaints.
Commentary

Eosinophilia was high as compared to case 17, with almost the same set of complexes less amoebic hepatitis, but in this case the patient was not so acutely ill.

It was probably due to infestation with ascariasis and chronic amoebic dysentery. Unfortunately an X-Ray picture was not ordered at the commencement. It is felt that if this had been done the lung parenchyma may have been demonstrated to be infiltrated with eosinophils producing scattered shadows of a transient nature. This assumption is reasonable as there had been eosinophilia demonstrated in the sputum.

In this case the bronchitis was really eosinophilic infiltration of the lungs due to ascariasis or amoebiasis.
Case 19

Age 33
Town Skinodt, Transvaal
Admitted 16.2.46
Discharged 28.2.46
Diagnosis on Admission Acute Bronchitis
Diagnosis on Discharge Bronchitis, Ascariasis Trichuriasis.

Complaint Cough and substernal Pain.

Previous History.

Had not been in hospital previously. No history of chest complaints before, none of diarrhoea, loss of weight or of night sweats.

Has felt "sick" at times but has felt fairly well since being in the Army.

History of Present Illness

Two days ago he was feeling fairly well but the same night he commenced to have a cough which was somewhat spasmodic and he did not breathe very easily during the intervals of coughing.

The pain also commenced the same night gradually becoming more severe, it was sharp in character and was felt mainly during a bout of coughing. It was situated substernally.

He brought some sputum with the cough which was frothy and not blood stained or mucoid.

He has no other complaints.

On Examination.

General Appearance. T immediately on admission 100, P 90, R 24. T two hours later normal.

A well built male of small stature who looks dyspeptic and somewhat asthmatical. There are no signs of anaemia, jaundice or clubbing of the fingers.

C.V.S. Systolic soft blowing mitral murmur, not propagated to the axilla. Other sounds are closed. Regular. Apex at 5th space 4" from mid line. R.P. 140/84.
Respiratory System

Equal expansion of both lung fields, percussion note is slightly impaired equally at both sides - normal for his build. Breath sounds are harsh vesicular with prolonged expiration and accompanying rales and rochichi through both phases. V.R. equal at each side.

Alimentary System. Liver is not enlarged or tender, abdominal tone is good and moves freely with respiration. No palpable tenderness. Peristalsis sounds are not excessive.

C.N.S. Equal and unexaggerated reflexes.

Other Systems n.a.d.

Treatment

For asthmatical bronchitis.

Ephedrine tabs gr 1/2. One tablet given morning and evening.

Mixture of potassium iodide gr 10 sod. bicarbonate gr 10 tinct. belladonna m 10

Ag. ad oz. 1/2 given t.d.s p.c. for next ten days.

Investigation

Of chest and blood.

Progress Notes

17.2.46 Slept indifferently last night. Breathing was improved. Had about five hours sleep with gr 1 1/2 nembutal.

Blood. W.B.C. 14,500/c.mm. Neutrophils 11%. Eosinophils 64% : 9,260/c.mm. Lymphocytes 25%.

18.2.46 X Ray. Chest. There is a diffuse mottling of both lung fields. especially mid and lower zones. In view of the high eosinophilia the picture is consistent with eosinophilic infiltration of the lung.

Slept well last night.

Chest is clearer today but there are still numerous rales and rochichi present.

19.2.46 Stool. Semi-formed, no exudates, ascaris and trichuris ova present. No dyspnea today, substernal pain quite relieved. Feels much better. Cough is much less and
sputum is scanty. There are a few ronchi but râles are still present.

Santonin and calomel course started, to treat the ascaris.

21.2.46 Many ascaris worms passed over the last two days. Cough is very much improved, râles and ronchi are no longer present in the chest. The T has been consistently down since admission to the ward.

Stool. Semi-formed, no exudates. Trichuris eva present.

22.2.46 01. Chenopodium 0.5 c.c. given at 6, 8 and 10 a.m. followed by 1 oz of mag. sulph. at 12 a.m. to treat the whip worm.

Blood. W.B.C. 10,600/c.mm.
Neutrophils 26%, eosinophils 40% : 5,098/c.mm., large monocytes 1%, basophils 1%, lymphocytes 24%.

24.2.46 Cough now absent, man is feeling quite fit. No dyspnoea.
X Ray of chest. c.f. with previous report. Signs of infiltration on the last picture are now quite cleared. Both fields are free of areas of opacity.

26.2.46 Stools. Formed, no parasites.
Blood. W.B.C. 8,700/c.mm.
Neutrophils 31%, eosinophils 38%: 3,306, large monocytes 2%, lymphocytes 26%.
Lungs - no clinical signs.
General condition is good.

28.2.46 Discharged as fit for duty.

Commentary.

The main complaint here with its recent appearance of symptoms was one leading to a diagnosis of acute bronchitis.

In the ordinary course of events this may have responded to routine treatment of bronchitis, but as the blood eosinophilia was shown by a differential count, and an X Ray picture ordered with investigation of bowel pathology to determine the true course of the symptoms, the real nature of the illness was discovered.

Undoubtedly the eosinophil lung infiltration was associated with the ascariasis.
Case 20

Age 37
Town Maseru, Basutoland
Admitted 18.12.45
Discharged 19.1.46
Diagnosis on Admission Acute Bronchitis
Diagnosis on Discharge Amoebiasis of lungs.
Complaint Recent cough and feverishness

Previous History

Does not remember having had diarrhoea at any time though admits his stools have occasionally been semi-formed. He had not paid any attention to his motions. Has been sometimes constipated.

He has not had a similar attack before and does not normally have any chest complaints.

He is often troubled by evil spirits who make him "ill". He is frequently accompanied by a "togolesh".

History of Present Illness

Two days ago in Durban he started to have a cough which he found was tiring him very much, and at the same time he began feeling feverish with bouts of shivering. He felt very hot at night.

He spits up a fair quantity of greenish stained sputum which is mucoid but not blood stained.

He has sweated considerably during the last week or two and has not felt equal to labouring work for a few weeks.

He has no dysuria. He has been slightly constipated recently.

On Examination

General Appearance T 98°, P 92, R 20

An adult male of medium build. Not specially toxic in appearance. Has a heavy, frequent and productive cough, without any apparent dyspnoea.

There is slight yellow tinging of the conjunctivae, no cyanosis.

C.V.S. Pulse 92/minute, regular in time and force. Apex 5th space 3 1/2" from the mid line. B.P. 128/78.
Respiratory System Equal expansion on both sides with some impairment of the percussion note on the left side. Breath sounds are vesicular on both sides with prolonged expiration. A few scattered coarse crepitations heard at the left mid zone, with many ronchi. On the right side very few crepitations were heard and ronchi were present but to a diminished degree as compared to the left.

Alimentary System The abdomen moves freely with respiration, good tone, no pain or tenderness on palpation. Liver not enlarged, no palpable tumours, no hyperparastalsis.

C.N.S. Reflexes equal, knee jerks present. No Argyll-Robertson pupils. No apparent reason for his illusions, other than native superstition.

Other Systems n.a.d.

Investigation of pulmonary condition.

Treatment Sedative expectorant mixture, routine treatment of rest in bed on the verandah and nourishing diet, and encouragement of sleep by warm drinks and codein phosphate gr 1/2 in aspirin and phenacetin powders of grs 5 each.

Progress Notes

20.12.45 No change, slept fairly well.
Stool. Formed, no exudate, cysts of E. coli seen.
Blood. Hb 104% R.B.C. 5,100,000.
C.I. 1.0 W.B.C. 14,100/c.mm.
Neutrophils 25%, eosinophils 62%:
8,742, lymphocytes 13%.
Film - no malaria parasites seen.
Pulmonary signs - crepitations with vesicular breathing and ronchi equal in both lung fields. The left side has now lost its increased number of adventitious sounds on admission.

22.12.45 Stool n.a.d.
Chest X Ray. Ill defined mottled shadows in both lung fields, particularly of the right lower zone and the upper part of the left lower zone. The aetiology is uncertain. For re-X Ray in 2 weeks.


26.12.45 Stool. n.a.d.
Commenced emetine hydrochloride gr 1 once daily for ten days, with carbarsone 0.25 Gm in capsule b.i.d. p.c. for ten days, to check the amoebiasis.


5.1.46 Cough is quite cleared now. No pulmonary signs elicited. Stool. n.a.d.

9.1.46 Stool. n.a.d.
Stool. cysts of E. histolytica seen. X Ray of chest. c.f. with last on 21.12.45 - both lung fields are now cleared. Points to the condition having been due to amoebiasis.

10.1.46 Stool. cysts of E. histolytica again present. To have course of Yatren and E-B-I

11.1.46 Emetine-Bismuth-Iodide gr 3 nightly for ten days, Yatren capsule 1 gr t.d.s. for ten days.

17.1.46 Stool. n.a.d.
Pulmonary signs remain totally absent.

18.1.46 Stool. Ova trichuris present.
Blood. W.B.C. 6,900/c.mm. Neutrophils 51%, eosinophils 12% : 828/c.mm, large monocytes 1%, lymphocytes 36%.

19.1.46 Discharged. No complaints. Fit for duty.

Commentary

This case yet again illustrates the value of an eosinophil count in a case where pulmonary symptoms are present and there are none of an alimentary origin. (In fact the patient was constipated)

The blood picture and X Ray picture gave one a clue where to look for the cause. The amoebiasis commenced to clear with emetine and the pentavalent arsenical, and later with E-B-I and yatren, together with rapid improvement of the lung picture.

This case shows the vital necessity of frequent stool examinations when eosinophilia is found, and for one not to be led astray with negative reports.
Case 21

Age 36
Town Flethor
Admitted 11.2.46
Discharged 24.2.46

Diagnosis on Admission  Influenza
Diagnosis on Discharge  Eosinophilic Infiltration of lungs.

Complaint  Pain in chest, coughing and spitting of blood.

Previous History

No illnesses at all, has never previously had a similar complaint. Is not subject to coughs, has not lost weight, does not get tired very easily. Bowels have always been regular.

History of Present Illness.

The illness commenced 6 days ago in Durban. The soldier began to cough, and this has now become worse with pain on both sides of his chest. The pain is sharp and is made worse by coughing, and deep breathing. For the last few days he has expectorated a fair amount of whitish, semi-mucoid sputum, which has been frothy and on two occasions tinged with blood.

His bowels are not troubling him.

On Examination

General Appearance  T 98, P 90, R 22.
Slightly built adult who looks mildly ill. Expectorating sputum tinged with bright red blood during the examination.

C.V.S. Apex 5th 3 1/2" from mid line. Sounds closed and regular. B.P.124/82. Pulse 90/ min. regular in time and force.

Respiratory System. Equal expansion of both sides on inspection and palpation. V.F. equal in corresponding areas. Breath sounds are vesicular throughout except at the right base which also has diminished note added to broncho-vesicular element. V.R. slight increase at right base.
Alimentary System: Liver not tender nor enlarged. n.a.d.
Haemopoetic System: Spleen not enlarged.
C.N.S.: Reflexes present and equal.
Other Systems: n.a.d.

Investigation: Of pulmonary system and blood.

Treatment: Sedative expectorant mixture.
Rest in fresh air and nourishing diet.

Progress Notes:

3.2.46 Still complaining of pain in chest and a cough. Sputum is no longer tinged with blood. T has been up to 100° F each evening.
Respiratory System: Signs at the right base are now cleared, and harsh vesicular breath sounds are more pronounced on the left side. No dullness on percussion and no increase in V.R.
Sputum: Nil for T.B.

4.2.46 Patient is feeling somewhat better.
X Ray of Chest (3.2.46)
Screen - heart not enlarged, no deviation of the oesophagus with the barium swallow.
There are multiple ill-defined infiltrations in the right lung fields and in the left middle zone. The aetiology is not certain from this examination. Further examination requested in two weeks.
T is not raised tonight.

6.2.46 Stool: N.A.D.

8.2.48 Steady uneventful relief of symptoms, with only slight cough which is unproductive and free from pain. Sedative expectorant mixture discontinued.
Sputum: T.B. not seen. Mites not isolated.

Blood: W.B.C. 23,300/c.mm. Neutrophils 32%, eosinophils 45% : 10,435/c.mm. large monocytes 4%, lymphocytes 19%.
R.B.C. and Platelets show no change from the normal.

Blood Film: No parasites seen.
Malarial parasites not present.

14.2.46 Sigmoidoscopy - no ulcers seen, mucus membranes healthy.
Stool: No parasites.
Blood: W.B.C. 10,800/c.mm.
Neutrophils 25%, eosinophils 44% : 8,620/c.mm., lymphocytes 31%.
Sputum. No T.B. present. None isolated on culture.

18.2.46 Twenty-four hours sputum. T.B. not observed. Gastric contents T.B. not observed.

20.2.46 Chest. Clinically clear.

21.2.46 X Ray of Chest. Both lung fields completely clear. In view of the high eosinophil count this must have been a case of eosinophilic infiltration.

Blood. W.B.C. 7,900/c.mm.
Neutrophils 29%, eosinophils 36% : 2,844/c.mm., basophils 1%,
lymphocytes 34%.

24.2.46 The pulmonary symptoms and signs are cleared, and x ray picture of the lung satisfactory. The eosinophilia has fallen considerably, from 10,485 to 2,844/c.mm.; without specific treatment, although it is still at a high level. The patient is however fit for duty. He is shortly due for leave and is anxious to leave hospital. Discharged.

Commentary

This case is unsatisfactory as it gives the picture of eosinophil infiltration of the lungs of a transient character with a high blood eosinophilia, but the cause was not found in spite of careful inquiry into the sputum and stool.

However it is felt that the case cannot be dismissed as idiopathic and it is believed that if an efficient follow-up were possible or the patient's stay in hospital prolonged, continued stool examination would eventually have shown the cause, and that the transient pulmonary infiltrations was merely a phase in a parasitic life cycle.
Case 22

Age 27
Town Johannesburg
Admitted 15.12.45
Discharged 3.4.46
Diagnosis on Admission: Influenza
Diagnosis on Discharge: Endocarditis

Complaint: Headache, cough, epistaxis

Previous History

There is no record of previous illnesses, and the man cannot remember having been ill before.

History of Present Illness

About three days ago, when in the transit camp in Durban, and after arriving from the Middle East the previous week, he complained of a generalised headache which lasted most of the day. He also had an epistaxis three days ago which cleared up after about half an hour. He did not lose much blood.

He has had a cough during the last week which is not troubling him very much and not giving him any pain.

He is unable to give any detail in his history, and appears to be a somewhat stupid fellow - on the other hand he appears rather toxic and is perhaps not giving as good account of himself as he might.

On Examination

General Appearance: T 100, P 85, R 20.
A thin weedy young adult of poor nutrition. He looks ill. There is considerable pallor of his mucous membranes, no oedema of feet, scrun or hands.
C.V.S: Apex 5th space 4" regular.
No thrill felt. Mitral systolic blowing murmur propagated to the axilla, and a mitral diastolic blowing murmur heard loudest when propagated up the left border of the sternum. Aortic, bicuspid and pulmonary sounds unimpaired.
Pulse water hammer type, 85/ minute
regular in time and force. B.P. 130/48, there must have been some impairment of the aortic valve associated with the mitral stenosis and incompetence.

Respiratory System Equal expansion, percussion unimpaired. Breath sounds vesicular without any adventitious sounds. V.R. good and equal in both lung fields.

Alimentary System Bowels open regularly, stools of normal consistency. No history of diarrhoea. Liver not enlarged. No abdominal tenderness or guarding. C.N.S. Present and equal.

Other Systems n.a.d.

Investigation of cardiac, blood and alimentary.

Treatment The patient is toxic, pyrexial with a headache and has a cough. Rest in bed, watch temperature chart, give veganin tabs 2 t.d.s. and thereby control the headache and suppress the cough.

Progress Notes

14.12.45 Mitral stenosis and incompetence with aortic incompetence signs confirmed. Not dyspnoeic, compensated. B.P. 124/46. Sitting and lying back in bed alternately, rapidly for twenty times raised his pulse from 85 to 133 and this did not fail to 82 for a period of nine minutes. The cardiac condition is either active or poorly compensated. There is however no oedema present. T varied between 99.8° and 100.2° today.

15.12.45 E.C.G. Normal rhythm. The pulse wave is somewhat increased in amplitude but is not bifurcate. B.S.R. 64mm/hour.

Blood. The R.B.C.s. show a moderate degree of anisocytosis - 2,680,000. HB 54%. C.I. 0.98 W.B.C. 5,400/c.mm. Neutrophils 22%, eosinophils 23% : 1,242/c.mm. lymphocytes 25%. Blood film. No parasites observed T rises to 100.6° at 0600 hours and 99.8° at 1600 hours.

16.12.45 T is normal throughout the day. Cough not affecting him now, and headache improving. Continue veganin tab 1 t.d.s 4 days.
20.12.45 T remained normal. Pulse has been 70 to 78 per minute during the last five days. Veganin stopped as the patient is not complaining of cough or headache.

Stool. Cysts of E. coli seen.


22.12.45 Urine. No r.b.cs., no bilharzia. n.a.d.


The patient is comfortable and without symptoms. T normal, and pulse 74.

24.12.45 Urine. Very scanty r.b.cs. less than one H.P. field. Scanty pus cells c. 1 per H.P.F. No parasites.

26.12.45 Condition is satisfactory, cardiac murmurs unchanged.

W.R. Negative.

28.12.45 Provocative mepharside .04 Gm for W.R.

Urine n.a.d.

Blood. Hb 64%, R.B.C. 3,230,000. C.I. 1.0

Feeling well, no pain, no cough.

4.1.46 W.R. taken following provocative mepharside was Negative.

Stool. No parasites. No exudates formed.

E.C.G. Pulse wave amplitude not regarded as significant. No change since previous cardiogram.

11.1.46 B.S.R. 45. Haematocrit 33%.

Blood culture. E. faecalis alkaligenes.

20.1.46 B.S.R. 33. Haematocrit 33%.

Diagnosis of rheumatic endocarditis was made because of anaemia, high B.S.R., and cardiac condition.

27.1.46 B.S.R. 30. Haematocrit 47%, Hb 83%, R.B.C. 4,700,000/c.mm. C.I. 0.9

W.B.C. 5,500/c.mm. Neutrophils 52%, eosinophilis 6%: 330/c.mm., basophils 1%, large monocytes 2%, lymphocytes 35%.

3.2.46 Blood culture. E. faecalis alkaligenes.

4.2.46 B.S.R. 23. Haematocrit 44%.

11.2.46 B.S.R. 23. Haematocrit 44%, Hb 80% R.B.C. 4,400,000/c.mm. C.I. 0.9

W.B.C. 4,150/c.mm. Neutrophils 48% eosinophilis 5%: 206/c.mm. lymphocytes 44%.

28.2.46 Condition still very satisfactory.

B.S.R. 10 Haematocrit 48%

Hb 94% R.B.C. 4,950,000/c.mm.

C.I. 0.9 W.B.C. 4,750/c.mm.

Neutrophils 51%; eosinophilis 7%: 331/c.mm. large monocytes 4%
lymphocytes 38%.

1.3.46
Stool. Negative.

2.3.46
X Ray of chest. Slight increase in the heart/ lung ratio. Cardiac shadow not characteristic of any particular valvular disease or lesion. Left ventricle a little enlarged. There is some general cardiac enlargement.

12.3.46
B.S.R. 5. To get up gradually.

22.3.46
No ill effects from getting up.
Diastolic murmurs at base of heart propagated to left border of sternum. Apical systolic murmur propagated to axilla.

3.4.46
Discharged from the Army.
Condition much improved and heart compensated. Feels very well. Unable to be employed permanently on light duties.

Commentary

This case of endocarditis presumably rheumatic in origin, was accompanied by a sharp rise in the eosinophil count. The stools were negative, urine was without positive finding and pulmonary signs negative to a parasitic aetiology.

The high erythrocyte sedimentation rate showed that the man was toxic, and his cardiac condition pointed to the probable cause of this. It can only be assumed that the eosinophilia was the result of the endocarditis and associated with it.

Without specific therapy the eosinophilia fell dramatically, as did the B.S.R. and the severity of symptoms.

It can only be concluded that the eosinophilia was a definite entity in this case. It may have been a direct result of the particular endocarditis, or a result of a sensitisation by the endocarditis of latent disease. In the absence of alimentary and urinary signs it can only be assumed that the eosinophilia in this native was directly associated with the endocarditis.
Case 23

Age 43
Town Atherstone
Admitted 28.12.45
Discharged 22.3.46

Diagnosis on Admission Right pulmonary congestion
Diagnosis on Discharge Eosinophilic infiltration of lung. Ascariasis. Syphilis.

Complaint Pain in the chest for one day.

Previous History

Has had coughs once or twice a year for the last three years but has not been incapacitated by them. Has not had pain in his chest before. Has not attended hospital previously. He cannot remember having had any specific illnesses as a child.

History of Present Illness

Pain in his chest commenced yesterday morning when he woke up. It was slight at first but gradually became worse so that when he takes a deep breath it hurts him. He does not feel the pain if he holds his breath. It is sharp in character, and situated on the right side below the axilla. It does not radiate. He is not complaining of a cough and his appetite is good. His bowels are regular, micturition five and one per diem without dysuria, or obvious haematuria.

On Examination

General Appearance T 97.4, P 78, R 20
Well built adult male, lying quietly without any signs of obvious respiratory embarrassment. Pharynx is clear and without inflammation, mucous membranes are not pale cyanosed or jaundiced.
C.V.S. Pulse 78, regular in time and force. B.P. 130/80. Apex 5th 3 1/2". All sounds closed, rhythm regular.
Respiratory System Equal expansion in both lung fields. Percussion note unimpaired on either side, Breath sounds are vesicular and without ronchi or crepitations, but a friction rub is just audible.
1 1/2" below the right nipple and 1" lateral to it. V.R. slightly increased at right mid zone.

**Alimentary System Abdomen**

moves with respirations, no palpable tumours, liver not enlarged, no intestinal hurry on auscultation.

**Genito-Urinary System Renal angles**

not tender. No supra-pubic tenderness on palpation. Urine no albumin or sugar.

**C.N.S. Reflexes**

equal and present.

**Other Systems n.a.d.**

**Treatment**

Painting the right side of the chest with Tinct. Iodid. Mitis t.d.s. Rest to reduce dyspnoea and pain. Full nourishing diet, may get up to toilet.

**Investigation**

of cause of apyrexial pleurodynia, and pulmonary congestion.

---

**Progress Notes**

29.12.45 Pain in right chest less severe but he is not breathing deeply since he is resting effectively. Still no cough.

30.12.45 X Ray of chest. Fairly large opacity shown at the middle right zone. Similar fainter shadow shown medial to tip of second right rib. Radiological diagnosis not possible. May be 1. pneumonia, 2. lung abscess without cavitation 3. primary atypical pneumonia 4. very doubtful tuberculous pneumonitis.

General condition is good. Pulmonary signs are unchanged. Not complaining of pain today. T is constantly 97 - 98.2° F.

Sputum. T.B. not observed.

Urine. No parasites seen. No r.b.cs. or leucocytes.

Stool. Ova ascaris present.

Blood. B.S.R. 8mm/hour. Hb 84%, R.B.C. 5,210,000/c.mm. C.I. 0.34 W.B.C. 9,300/c.mm. Neutrophils 57%, eosinophils 9% : 828/c.mm, mononuclears 3%, lymphocytes 31%.

No complaints and still resting

Good appetite.

Pulmonary signs absent.

5.1.46 General condition is still good.
9.1.46 X Ray of chest. Base of right lung a little clearer, otherwise no change.

16.1.46 Lung fields clear clinically. B.S.R. 5 Haeematocrit 47%. Hb 82%, R.B.C. 4,980,000/c.mm. C.I. 0.85 W.B.C. 6,900/c.mm. Neutrophils 38%, eosinophils 10% : 1,842/c.mm. Large monocytes 4%, lymphocytes 40%.

17.1.46 W.R. double positive. Placed on penicillin 80,000 U 4 hourly for five days.

20.1.46 X Ray of chest. No change noted since last picture.

23.1.46 Clinically still no pulmonary signs. Bronchogram suggested if no improvement shown.

7.2.46 X Ray of chest. The opacity of the lower part of the right middle zone if anything is slightly less clearly defined. has been previously shown to be near the apex of the lower lobe. Opacity to the right of the upper mediastinum has begun to clear, but there is now some infiltration lateral to and below it. There appears to be a density in the left hilum. The condition may be 1. Gumma 2. T.B. 3. Neoplasm.

15.2.46 The man feels well. He refuses to have gastric aspiration for T.B. examination.

22.2.46 E.N.T. specialist report. Vocal cords are intact and move freely. There is some slight congestion around the arytenoids but no ulceration is present. There are no obvious T.B. or syphilitic lesions.

25.2.46 Still no clinical signs. General condition is good. W.R. is negative.

X Ray of chest. Opacity in lower part of right mid zone has become less extensive. The fresh infiltration commented on in the previous report has disappeared almost completely and the opacity seen adjacent to the right upper mediastinum has also disappeared. The density in the left hilum appears less sharply defined.

3.3.46 W.B.C. 9,450/c.mm. Neutrophils 58%, eosinophils 16% : 1,520/c.mm., monocytes 5%: lymphocytes 39%.

12.3.46 X Ray of chest. Slight improvement
appears to have taken place in the lesion of the lower part of the right mid zone. Above this however, there appears to be some fresh infiltration. The density in the left hilum is less distinct. The aetiology of these lesions is still not clear.

14.3.46 Clinically the man is very fit. Santonin and calomel of each gr 3 for two nights to be given followed by 1/2 oz. mag sulph each morning after the night's dose.

15.3.46 Some round worms passed. May get up.

18.3.46 Stool. Formed, no exudates and no parasites seen. Carbarsone 0.25 Gm pulvule b.i.d. for ten days.

25.3.46 W.R. Negative.

28.3.46 X Ray of chest. There is marked improvement in the right mid zone lesion, only a very slight density remaining. Other lung areas are quite free of infiltration signs.

W.B.C. 8,600/c.mm. Neutrophils 47%, eosinophils 8% : 688/c.mm.: large monocytes 2%, basophil 1%, lymphocytes 42%.

29.3.46 Discharged as fit. To report to a venereologist for tests of cure.

Commentary

This is a mild case of eosinophilia with an obscure aetiology. Short duration of pulmonary referred pain was present, with densities shown radiologically. These densities had a more or less constant position.

The case was complicated by syphilis and ascariasis. The eosinophilia and lung infiltrations may have been produced as the result of either syphilis or ascariasis - or some other cause not demonstrated.

There appeared to be no picture of allergy present. There was no history of sensitivity.

The pulmonary picture improved slightly after anti-syphilitic treatment, but markedly so after santonin and carbarsone therapy.
Unfortunately it is not clear which of the latter two, if either were responsible for clearing the densities in the lung fields.

The case is not an entirely satisfactory one from an aetiological point of view, the eosinophilia was not high in comparison to that one may expect from the existing pulmonary picture, but in view of the findings it may be safely decided that the causal factor was ascariasis.
Case 24

Age 30
Town Grickwaland
Admitted 20.6.45
Discharged 30.7.45
Diagnosis on Admission Amoebic dysentery
Diagnosis on Discharge Worm infestation

Complaint Abdominal pain for one week.

Previous History

The patient says he had amoebic dysentery when he was in the Middle East in 1942. There is no documentary confirmatory evidence of this. He gives a history of diarrhoea in 1942 while in the M.E.F. with passage of stool containing red blood. Subsequently he has had diarrhoea alternating with constipation. He says he has been subject to attacks of asthma for several years - he cannot remember when it commenced. There is sometimes a period lasting a month or two, of freedom from asthmatical attacks. He occasionally wakes up at nights with dyspnoea.

History of Present Illness:

He commenced to have pain in his abdomen one week ago. It was cramp like in character and situated mainly around the umbilicus. He noticed the cramps especially after taking food. He has vomited on a few occasions during the last week about ten minutes after eating his food. He has had diarrhoea over the same period with the passage of mucus in his stool but with no melaena.

On Examination

General Appearance T 97.6, P 88, R 18.
A well built adult who does not look particularly ill. No signs of pallor, cyanosis or jaundice. He is not dyspnoeic and has not the appearance of being in status asthmaticus.
Cardioc sounds closed, regular. BP. 122/86. Pulse 88/minute, regular in time and force.

Respiratory System: Expansion and percussion notes unimpaired and equal both sides. Breath sounds are vesicular throughout accompanied by expiratory ronchi of slight degree. V.R. good, equal in corresponding areas of both lung fields.

Alimentary System: Abdomen moves freely on respiration, on palpation no abdominal rigidity, no palpable tumor. There is marked tenderness over the caecum, and almost as much at the left iliac fossa over the pelvic colon. Liver and spleen are not palpable.

Bowels have been irregular since 1942. At present he has diarrhea - four times daily, the stool containing mucus. He has not noticed the passage of any worms.

C.N.S.: Reflexes are equal and present.

Investigation of alimentary disease by stool examinations and blood pictures.

Treatment: Is symptomatic until the etiology is elucidated. Rest in bed but allowed up for toilet and bed making.

As he has had diarrhea for a week he is to take five pints of fluid daily. To control the diarrhea a mixture taken before meals and containing tinct. Belladonna m 5 and codein phosphate gr 1/4 to be given.

Progress Notes

22.6.45 Stool. Semi-formed, scanty r. b. c.s. ova trichuris trichura present.

Blood. Hb 111%, R.B.C. 5,470,000.

C.I. 1.01, W.B.C. 5,800/c.mm.

Neutrophils 46%, eosinophils 21% : 1,218/c.mm., lymphocytes 31%

The parasite found is not sufficient to warrant the eosinophilia. The latter may be due to an allergic
basis manifested by the asthma. In this event the diarrhoea itself is not explained. Repeat stool examinations.

24.6.45 Stool. Semi-formed, occasional pus cell, no parasites.

Not complaining of much pain now. The intestinal sedative does not appear to be having much effect, apart from relieving him of umbilical pain.

26.6.45 Stool. Liquid, no exudate, no parasites.

28.6.45 Stool. Semi-formed, r.b.cs. with vegetative forms of Giardia lamblia. Mepacrine hydrochloride 0.1 Gm t.d.s. p.o. for five days; to clear this flagellate infestation.

30.6.45 Stool. Formed, scanty r.b.cs. ova of Ascaris and trichuris present. Santonin and calomel course commenced.

4.7.45 Condition has improved, several round worms passed.

6.7.45 Still complains of some diarrhoea.
Stool. Formed, no exudate, no parasites.

17.7.45 Stool. Liquid, occasional r.b.cs. No parasites seen.

19.7.45 Complains of some backache which he says he has not mentioned before but he says he has had for some time.

20.7.45 X Ray of Lumbar spine. No abnormal bony change seen. There is complete movement of all the spinal joints.

21.7.45 He says his back is better after the "magic X ray".

29.7.45 Bowels have been formed for the last four days.
Stool. No exudates, no parasites.
Blood. B.S.R. 2mm/hour Haematocrit 50%. W.B.C. 5,900/c.mm. Neutrophils 43%, eosinophils 8% : 472/c.mm. basophils 1%: large mononuclears 2%, lymphocytes 4%.

30.7.45 No complaints, feels well, discharged.
This case of eosinophilia due to ascariasis infestation and complicated by giardia lamblia and trichuris super-imposed on a history of amoebiasis, at first failed to show parasites in the stool to account for the symptoms. A slight increase in eosinophilia can be expected with mepacrine therapy. Repeated stool examinations were carried out before parasitic infestation was confirmed. It is stressed that where eosinophilia is present the aetiology should be consistently sought for in the alimentary tract; and failing success only then should other causes of eosinophilia be investigated, when dealing with the South African native.
Case 25

Age 32
Town Germiston, Transvaal.
Admitted 15.10.45
Discharged 9.11.45 to Ladysmith Sanatorium.

Diagnosis on Admission: Influenza
Diagnosis on Discharge: Bilateral pulmonary tuberculosis.

Complaint: Generalised body pains, headache and anorexia.

Previous History:

He states he had no previous illnesses and has not been affected similarly before.

History of Present Illness:

He was feeling quite well until two days ago, he then commenced to have pains all over his body, head, back, chest, legs and abdomen. The headaches were not localised and lasted for several hours at a stretch. They were not very severe. His appetite has been poor for about two months and he has not felt completely fit for this time. This last week he has felt even less inclined for taking food. He has also had nausea during the last two days.

There is no history of night sweats and he is not aware of sweating unduly during the day. He does not complain of having a cough and does not expectorate to any extent.

On Examination:

A man of average build, poorly nourished and round shouldered. The accompanying N.C.O. says he is easily tired at his military duties, and has been frequently falling out with petty complaints. Appears to be somewhat nervous.
C.V.S.: Pulse 106, regular in time and force, good wave. B.P. 160/100. No oedema of legs, sacrum, face or hands apparent. Apex 5th space, 3 1/2" from mid
Cardiac sounds closed and regular.

Respiratory System Pharynx not congested, sputum frothy and mucoid - not coloured or foul. Equal expansion of both sides of the thorax. Total chest expansion 2". Chest 30". Percussion equal at all corresponding areas at each side. Note: unimpaired. Breath sounds are harsh vesicular with no adventitious sounds. V.R. good and equal.

Alimentary System Bowel action regular, once daily, normal consistence. No history of diarrhoea. Abdomen moves freely on respiration. No guarding, and no particular tenderness on palpation. Peristalsis sounds are regular and not increased in number or intensity. Liver not tender or enlarged.

Haemo poetic System Spleen and lymph glands not enlarged.

C.N.S. Reflexes equal and present.

**Treatment**

Of influenza, rest in bed, relief of pain with aspirin and phenacetin aa gr 4, codein phosph. gr 1/8 (Tab Codein Co) 2 tablets q.i.d. Nourishing full diet. Is sleeping well and does not require narcotics.

**Progress Notes**

16.10.45 Afebrile. Still complaining of generalised body pains. Respirations are 40 per minute. Pulmonary sounds are harsh vesicular with slight ronchi all over the lung fields. Reduce Tab Codein Co tabs to 1 t.i.d.

17.10.45 T 102, R 40. Blood smear. No malarial parasites found.

18.10.45 T 102, R 40. Complains of cough. No pleurisy, sordes on lips, alae nasi are not moving. X Ray of Lungs. Mottled opacities are present from infra-clavicular areas to bases of both lung fields. Appearances are those of tuberculous infiltrations. Blood. Smear - no malarial parasites Urine. No albumin, no sugar. No bilharzia, no pus or red cells.
19.10.45 Blood smear - negative for malaria.
Stool. Formed, no exudate, no parasites.
T 100.3° F. R 36, P 112.
Dullness over the left base on percussion. Breath sounds are diminished and vesicular with fine crepitations. Diminished vocal resonance.
Blood. W.B.C. 16,000/c.mm.
Neutrophils 26%, eosinophils 85% : 10,400/c.mm., lymphocytes 9%.

20.10.45 T slowly falling by lysis, today 99.8; R 28.
Stool. No parasites.

21.10.45 Sputum - positive for T.B. Feeling better, no pains and no headache.

22.10.45 Sputum - positive for T.B.
Stool. No parasites.
Cough is now only slight.
B.P. has remained at a high level throughout. 160-140/110-100.

He is an essential hypertension case with pulmonary tuberculosis.
Urea concentration range. Blood Urea 35 mgs/100 mls. Maximum concentration 2.3 Gms % for 86 c.c.
Normal range, no polyuria - essential hypertension.

Stool. No parasites.

28.10.45 Afebrile.

30.10.45 Lung signs still present, dullness now at right base.
T showed daily variations of 99.6° to 98.8° F until 29.10.45

**Disposal**

In view of positive T.B. findings this case has been transferred to the T.B. Sanatorium at Ladysmith.

**Commentary**

This case presents an unsolved picture of high eosinophilia. The history of the patient did not suggest pulmonary tuberculosis in the first place. Secondly the pyrexia was short lived and soon settled on routine rest treatment.

The eosinophilia was very high as was the general white cell count. Routine
control blood examinations made by myself on proved T.B. cases in the African native did not present a similar picture - indeed there were no increases in the eosinophil count. Therefore eosinophilia is not pathognomonic of a tuberculous native.

Stool examinations were negative throughout.

Unfortunately the case was compulsorily disposed of to a T.B. sanatorium which prevented a follow-up by further X Rays, blood estimations and persistent examination of the stools.

It is felt that could the case have been followed up the final picture might have been as follows:

A case of essential hypertension and chronic mild pulmonary tuberculosis on which was superimposed a parasitic infestation undergoing a pulmonary phase in its life cycle. This would complicate the X Ray findings. The parasites were not demonstrated at the time in the stools, but at a later date would have shown evidence of their presence by appearing in the alimentary or genito-urinary tract, accompanied by clearing up or improvement of the pulmonary signs, leaving only the pre-existing tubercular lesion.

This deduction is a hypothesis based on the fact that pulmonary tuberculosis alone did not produce an eosinophilia, and there was no evidence that this case was exceptional.
### Summary of Case Findings

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<th>Pathological Findings</th>
<th>Maximum Temperature Pneumonia</th>
<th>History</th>
<th>Duration of Symptoms</th>
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<th>Pulmonary Findings</th>
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<th>Age</th>
<th>Condition</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Weymouth</td>
<td>Bilharziasis</td>
<td>-</td>
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<td>33</td>
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<td>180/200 %</td>
<td>Dyspnea</td>
<td>17 weeks</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>60</td>
<td>Cerebral</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>Newfield</td>
<td>Cerebral abscess</td>
<td>-</td>
<td>-</td>
<td>190/210 %</td>
<td>Dyspnea</td>
<td>18 weeks</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>62</td>
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<td>-</td>
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<tr>
<td>23</td>
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<td>Cerebral abscess</td>
<td>-</td>
<td>-</td>
<td>200/220 %</td>
<td>Dyspnea</td>
<td>19 weeks</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>64</td>
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<td>-</td>
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<tr>
<td>24</td>
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<td>Cerebral abscess</td>
<td>-</td>
<td>-</td>
<td>210/230 %</td>
<td>Dyspnea</td>
<td>20 weeks</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>66</td>
<td>Cerebral</td>
<td>-</td>
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<tr>
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<td>220/240 %</td>
<td>Dyspnea</td>
<td>21 weeks</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>68</td>
<td>Cerebral</td>
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DISCUSSION

Much has been written and discussed concerning the cause of eosinophilia in general; and its presence noted in a wide variety of diseases and conditions.

There is no known definite factor common to all, producing the increased output of eosinophil leucocytes in the blood.

Full reference has already been made to the literature in the Introduction to this Thesis. All reported causative factors and recorded cases have been fully reviewed.

The eosinophils appear to be stimulated in their production by certain agents elaborated by a number of parasites, by some infections of bacterial origin, by some diseases of an allergic nature and by some diseases which appear to attract the eosinophils as it were by positive chemotaxis giving a tissue eosinophilia.

Thus blood and tissue eosinophilia may vary and little is known of tissue eosinophilia, which may be much more common than is realised. The transitory pulmonary striations seen in several of my cases are an example of tissue eosinophilia accompanied by an increase in the blood. In Hodgkin's disease the tissue eosinophilia is said to be higher than that of the blood, but Hodgkin's disease is rarely seen in the native.

Higgart (1932) suggested that the injection of an animal protein stimulated the production of eosinophils. Campbell, Drennan and Maitie (1936) showed that foreign proteins, especially if repeated, produced an eosinophilia. This alone is most suggestive of an allergic response.

It is assumed that eosinophilia caused by certain drugs is the result of a protein product liberated by the toxic action of the drug concerned in the tissue cells.

Twenty-five cases of eosinophilia have been presented and studied, in an
attempt to determine the significance of this sign as affecting the South African native, and a tabular summary of the case findings together with the comments on each, is attached.

The series have been chosen more or less at random, in the main only considering those with a fairly high degree of eosinophilia.

It will be seen that the disease commonest to the majority, evidenced in sixty per cent of the cases, is infestation with ascaris. Ascariasis appears to be very prevalent in the native.

Transitory pulmonary infiltrations were noted in several of the cases and the symptoms and signs of the pulmonary affection appeared to mask the underlying disease producing it. In most of the cases with eosinophil infiltrations of the lungs a parasitic infestation was demonstrated concurrently. This fact is of some considerable significance as it has an important bearing on first the differential diagnosis clinically and radiologically of pulmonary disease, and secondly it points to the necessity for thorough investigation of the alimentary tract, and the need for eradicating the causative parasite.

It is of interest to note that it was frequently found necessary to do repeated stool examinations before the parasite or its' ova were isolated. Some of the cases did not meet with success in this direction, because for various reasons examinations of the stools were not persistently pursued.

According to Weingarten proximity to the sea produced the syndrome of "tropical eosinophilia", but it is suggested that a clearer picture of the aetiological factor would have been elicited if he had concentrated on a thorough investigation of the parasitology of the alimentary tract. The geographical distribution of his cases is significant, not from its proximity to the sea but because of the possibility of ingestion and infestation with parasites endemic in the area, which are capable
of producing the syndrome.

The syndrome of eosinophilia, pulmonary infiltrates and ascariasis demonstrated in the cases bear out Müller's auto-experiment. His ingestion of ascaris ova material and his follow-up observations of pulmonary infiltrates seen by X Ray leave no doubt of the associated clinical relation of the three signs.

It was found that uncomplicated tuberculosis in the native did not produce an eosinophilia. In the cases of tuberculosis where an eosinophilia was evident the transfer to Sanatorium hospitals prevented a follow-up which would determine the exact cause of the altered blood picture, and the complicating disease was therefore not discovered.

Amoebic dysentery is also relatively common, and amoebiasis is seen in association with ascariasis in several of the cases. In one pulmonary symptoms were the first complaint. It was only by routine eosinophil count that suspicion was directed to the alimentary tract, and Entamoeba histolytica was isolated.

Amoebiasis with liver abscess may conceivably produce pulmonary signs, if the abscess is subcapsular and if it is situated just below the diaphragm. In this case the marked eosinophilia and pulmonary signs were cleared by anti-amoebic therapy.

In one case of endocarditis an eosinophilia was found. No other cause was demonstrated to produce the blood change. It is presumed that the endocarditis was the initiating factor and the eosinophilia appeared as it does following any acute toxaemia in the convalescent stage.

Bilharziasis in another case was shown to be associated with bronchial asthma in the production of an increased eosinophil count, and in a second case a history of infestation with bilharzia was given, though causal parasites and lesions were not seen. This disease
has a fairly wide distribution among the natives of South Africa, and is shown to be mainly limited to those residing in the vicinity of the rivers infested by the intermediate host - physospirosis africana principally. The attached map of South Africa gives the location of the rivers which are mainly affected.

Trichuriasis is frequently met with and is difficult to cure permanently and contributes to the incidence of eosinophilia. Trichuriasis per se does not produce a high count.

Drug eosinophilia of a mild form from taking mepacrine was not seen in the soldier returning from malarious areas overseas e.g. Italy, where suppressive anti-malarial mepacrinisation was practised. This was expected as the results of the mepacrine had worn off long before disembarkation in South Africa.

CONCLUSION

In the approach to the sick native it should be remembered that little if any reliance can be placed on a history. In any case histories are frequently lacking. In the first place their previous illnesses are inadequately treated by "first aid" workers in the shape of medicine men, and occasionally as in the Army by qualified attendants. The diagnosis therefore is never available for them to remember and refer to when subsequently ill. Secondly, as already stressed, the time factor is misleading due to lack of education and time/event memory.

In many cases the patients have lived long in a state of comparative symbiosis with their parasits, and intestinal symptoms are most frequently lacking in their histories. This is important as the majority of cases were traced to have an alimentary pathology.

In three hundred differential counts on hospital patients six per cent were found to have an eosinophilia of over 10% of the white blood cells. In seventy native patients coming from
a troopship returning from overseas, only two showed an eosinophilia above 4%. These men had been away from the country for a considerable period, under the control of military hygiene and medically treated when necessary.

It is felt that a six per cent ratio in hospital among the small numbers casually tested is a sufficiently high figure showing an eosinophilia, to merit conducting a differential count on all hospital medical admissions, whatever their symptoms. Those with a positive eosinophil finding should then be most thoroughly investigated to ascertain the cause, and as demonstrated in my series, and if necessary by repeated, and again repeated laboratory search.

Only thus will treatment of some cases of asthmatic bronchitis, and bronchitis, prove to require a vermaifuge rather than an anti-spasmodic for a final cure. Again others of snap diagnosed "pulmonary tuberculosis" may show no need for sanatorium treatment, but require no specific treatment at all as in Loeffler's syndrome or parasitic eradication as in what may be called Müller's syndrome.

Apart from routine eosinophil count there is very little else to assist diagnosis in the every-day investigation of these cases.

Pyrexia in eosinophilia producing diseases is not a constant finding. The history as already discussed, is quite useless to depend on unless it is a chest complaint, in which case it is often more useful than an alimentary one. History of duration of symptoms is also unreliable for periods are usually given as 3 days, 1 week, 3 weeks or years ago with few exceptions. The age of the sick African is also unreliable and has no significant standing in the investigation of a case of eosinophilia.

Towns of origin are of some assistance as thus a notoriously infested area may give some clue as to the nature
of the disease e.g. along rivers infested by the host of bilharzia. The native may claim to belong to a town when in fact his village may be several miles from it, but should he actually work in a large community the insanitary conditions prevailing for the poor may account for his having fallen prey to the result of these conditions.

In particular the investigation of a case of eosinophilia should if necessary be directed to several examinations of the stools and urine for parasites. Further radiological pictures of the respiratory system, taken at intervals, are also of considerable assistance. Many show positive signs which in the main are transient and are frequently missed if not screened at the time.

Finally treatment is based, not on the finding of the eosinophilia in a particular case, but in the eradication of the aetiological factors.

It is felt that in the teaching of medical students and qualified practitioners handling the African native, sufficient stress has not been placed in the past on the need for routine eosinophil counts, and sufficient importance has not been laid on the possibilities of other signs and symptoms masking the true disease causing the eosinophilia.

The routine check on all admissions will serve to lower the high incidence of excremental disease due to parasitic invasion, which is so prevalent in the black. Instructions concerning water hygiene and sanitation are not of sufficient use. The man is too primitive to benefit practically by education alone, and there are too many adverse conditions - mainly economic, which are beyond his control. For example poverty, breaking of tribal laws and customs, overcrowding in inadequate shack accommodation outside the cities, insanitary water supply and ill-organised refuse and excreta disposal. Adequate medical treatment of all cases diagnosed coupled with a drive by the public health authorities will provide the ultimate answer to the problem.
SUMMARY

In this thesis the aetiology and significance of eosinophilia in general has been discussed.

A series of twenty-five cases is reported fully where an increase in the blood eosinophilic count was present in all.

Observations on all the cases have been made in the commentaries on each and a discussion of the findings is finally conducted.

The significance of eosinophilia in the native of South Africa has an important bearing on the public health eradication of excremental disease and prevention of pulmonary tuberculosis.

In the solution of these problems three major facts are evident from this study. They are:

1. The native who is responsible through his own peculiar social conditions, for the dissemination of excremental disease seldom complains of alimentary tracts disorders when seeking medical attention.

If a particular symptom be present in his case it usually is attributed to the respiratory system.

2. The sick African native with pulmonary symptoms should be closely studied with a view to the exact aetiology of his pulmonary syndrome.

This was shown in the case series to be almost invariably due to a parasitic alimentary pathology; which when eradicated spontaneously cleared the pulmonary picture.

The pulmonary signs seen radiologically simulated tuberculosis in several of the cases studied and unless the medical attendant is on the watch for a parasitic cause the man may be inadvertently be diagnosed as tuberculous and suffer hardship.

3. In many instances parasites were only isolated after repeated and again repeated examinations of the stool.

It is unfortunately too easy a practice to treat the patient symptomatically,
search once or even three times in the stools for parasites, and discharge him after a short rest.

This attitude will not help to clear the country of infestation.

If an eosinophil count were to be taken of every medical admission to hospital whatever the symptomatology, and when found positive the cause searched for and eradicated much saving of pulmonary syndrome and other symptom complex therapy would be effected and the interests of public health in South Africa advanced.
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