THE COMPARATIVE FREQUENCY OF IMPAIRED NASAL RESPIRATION AS AN ANTECEDENT TO PULMONARY AND TO EXTRAPULMONARY TUBERCULOSIS.

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IN the BRITISH MEDICAL JOURNAL of date June 16th, 1906, endeavour is made to show quantitative or qualitative impairment of nasal respiration in the light of a common predisposing cause of pulmonary phthisis, two reasons being advanced in support of this contention:—

1. The condition in question presented itself nearly twice as frequently amongst some male phthisical cases as in a series of non-tuberculous men, comparable in respect of age and of occupation and social condition.

2. That whereas several causes of nasal and of nasopharyngeal abnormality are known to be hereditary, a family history of pulmonary phthisis* was found to be much more frequently given (except amongst those of very poor physique) by the subjects of impaired nasal respiration than by others; and this held good of non-tuberculous as well as of phthisical males.

It was concluded, in short, that the initial channel of infection in pulmonary tubercle was, in a good number of instances, almost certainly respiratory. In order to institute a comparison of pulmonary tubercle with extrapulmonary in this respect, the following cases were collected from the wards of the Royal Sea-Bathing Hospital, Margate, and of Charing Cross Hospital, through the courtesy of Dr. B. E. Moss and others. The cases comprised bone, joint, and gland affections and lupus.

It was thought best, in order to approximate as closely as possible to the age of infection, to record in each case the age at which symptoms became apparent—roughly, that is, when the disease became clinically evident. The extrapulmonary tuberculous cases (taken first) were thus grouped according to age of onset of disease, and also according to sex. Cases of pulmonary tubercle, from a series gathered at English public sanatoriums, were then picked (in rotation and without further selection), conformable to the first set in both these respects. Each series, then, had the following age and sex distribution:—

TABLE I.—*Distribution, as regards Sex and Age of Onset of Disease, of Two Series of Tuberculous Cases, Pulmonary and Extrapulmonary.*

Age Group.	Men.	Women.
Years.		
11—13	2	2
14—16	10	6
17—19	7	4
20—22	3	4
23—25	0	3
26—28	3	0
29—31	0	1
35—37	2	1
38—40	1	0
47—49	1	0
Totals ...	29	21

It is to be regretted that so few cases were available, by reason, of course, of the fact that the common age of onset of extrapulmonary is so much lower than that of other tubercle. There was no obstacle to getting many cases of the former in children, but it would have been very difficult to find a like number of juvenile cases of pulmonary phthisis.

* Infection was approximately excluded.

The result of the comparison may be presented as follows:—

TABLE II.—*Comparative Frequency of Impaired Nasal Respiration as an Antecedent to Pulmonary and to Extrapulmonary Tuberculosis.*

Causes of Impaired Nasal Respiration.	Men.		Women.	
	E.P. T. 29 cases.	P. T. 29 cases.	E.P. T. 21 cases.	P. T. 21 cases.
The commoner causes of anterior nasal obstruction ...	5	6	1	4
Probably as a result of posterior nasal obstruction or its sequelae, or contributed to by an overhung condition, or by projecting teeth ...	3	7	3	4
From clinically prominent catarrhal conditions ...	0	3	0	2
From other causes (trauma, habit, and uncertain) ...	1	1	2	0
Totals ...	9	17	6	10

Thus, in 50 (29+21) cases of extrapulmonary tubercle, there were 15 (9+6) cases showing impaired nasal respiration, a percentage of 30; while in the same number of pulmonary tuberculous cases there were 27 (17+10), a percentage of 54.

Now, these figures come very close to some previously found. In the communication already alluded to, in the course of a comparison of phthisical with non-tuberculous males, the percentages of the subjects of impaired nasal respiration were found to be respectively 56.7 and 30.8, and these proportions were found to be inherent fairly uniformly in each 40 or 50 cases examined. Thus it would not seem to be likely (one writes with a lively sense of the paucity of the cases here brought forward) that mouth-breathing and "qualitative" impairment of nasal respiration are commoner in cases of extrapulmonary tuberculosis than in healthy people, who constituted the great majority of the non-tuberculous males in question. It is concluded that there may exist, as between pulmonary and extrapulmonary tuberculosis, the following etiological point of differentiation—namely, that a certain mode of infection, a prerequisite of which is some abnormality of the upper respiratory tract, obtains more frequently in pulmonary than in extrapulmonary tubercle; and that perhaps, in the latter, it obtains very rarely or never. As to the exact route of invasion, it must be remembered that there exists a body of French and German evidence fairly conclusive as against direct respiratory infection of lung tissue. Conformably with the theory of intestinal origin, the common way in which the subject of impaired nasal respiration gets infected would seem to be by deposits left by unfiltered air in the mouth or nasopharynx or oropharynx reaching the alimentary tract. The anatomical relations of Waldeyer's ring and the mucous membranes to the lymphatic system may also be invoked.

It only remains to suggest again the importance (as a wide and almost untouched field of prophylaxis and treatment of pulmonary phthisis) of the securing, by medical and other means, of normal nasal respiration, notably, as regards prophylaxis, among school children and among recruits.

THE TREATMENT OF PHTHISIS BY SANATORIUM METHODS.

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At a time when the usefulness of sanatorium treatment has been called in question, the following brief description of one of many successful cases under my own supervision will be of interest. Sufficient time has elapsed to justify one in classing the patient amongst the cured.

Alfred B., single, aged 31, was received into the Sanatorium on February 25th, 1903. His father had died of phthisis; pre-

vious health good, excepting one week in bed with "inflammation of the kidneys."

His present illness began about eleven months before with a "cold" attended by cough and expectoration and occasional vomiting. These symptoms remained in evidence until August, 1902, from which time until January, 1903, there was some remission of the symptoms and apparent improvement. In the latter month the symptoms became again more pronounced; vomiting was more frequent, and cough and expectoration were much increased; night sweating and slight haemoptysis began; diarrhoea, at times frequent and severe.

State on Admission.—These symptoms were all markedly present on admission to the Sanatorium, and signs of consolidation were conspicuous, extending over an area representing the upper and middle lobes of the right lung, front and back. Patient very anaemic, weak, and short of breath; weight, 8 st. 2 lb.; tubercle bacilli present in sputum.

Treatment.—The patient was kept in bed for a month, carefully dieted, and received special nursing attention. He then began to sit up, at first for a few moments daily, which were gradually increased in number. At the beginning of the fifth week he was visited by a relative, the result being a rise of temperature to 102° F. (the previous day the temperature had not risen above 100° F.). In seven weeks he had entered upon the exercise stage, at first only ten minutes being allowed.

Chart I shows the course of the temperature at four stated periods of the day during the first three weeks of treatment.

Chart II relates to three weeks approaching the end of the period of treatment. Total duration of treatment, 26 weeks.

Points of Interest.

1st Chart: (a) The height of temperature in comparison with the comparatively small daily variation. (b) The maintenance of the latter characteristics, accompanied by the gradual subsidence of the "mean" temperature. (c) The steady increase in weight in spite of vomiting.

Over six weeks elapsed before the temperature was normal at any time of the day.

2nd Chart (approaching the end of the period of treatment): (a) The strongly marked contrast when compared with the first three weeks of treatment. This contrast becomes even more noticeable when the chart is subjected to a careful scrutiny. (b) The *second* temperature (taken per rectum directly after exercise) is seldom over 99°, though the exercise (hill climbing) varies between 2 and 2½ hours; in fifteen instances it is 99° or below, and in *two* of these it is 98.4°. The total gain in weight was 29 lb., and the physical signs were indicative of complete arrest of disease.

Other points of interest will occur to those exclusively devoted to sanatorium work. I have selected a few of the most striking.

The patient is now (three years afterwards) perfectly well, and is following his ordinary duties. I have seen him recently, and he is the picture of health.

The rise in temperature from a maximum of 100° to 102° after the reception of a visitor is suggestive.

A CASE OF HAEMOPTYSIS,

WITH NUMEROUS SPIROCHAETES IN THE SPUTUM.

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THE following are the notes of the case:

T. S., male, aged 30, black. Admitted to hospital on July 28th, 1906, in the evening, with profuse haemoptysis and a temperature of 105° F., having been picked up by the police in the street. Stated that he had been ill only four days with slight haemoptysis and cough, and that he had the severe haemorrhage while trying to reach a doctor. Insisted that he had been quite well previously. Was not emaciated. One leg is terribly deformed by an unset fracture of the femur dating from childhood. There are scars of tertiaries on both legs. Examination of the chest gave evidence of a cavity below the right clavicle in which were coarse râles. Dullness and fine crepitations extended over the lower part of this lung. At the first examination of the sputum no tubercle bacilli were seen, but numerous spirochaetes which stained with methyl blue. No ova of parasites were found in the fresh sputum. The blood contained malarial parasites.

The patient continued to have attacks of haemoptysis, in two of which he was nearly asphyxiated by the tough, tenacious sputum and clots. He had to be turned over and his head allowed to hang over the side of the bed to relieve him. The temperature rose every evening, but never dropped to normal.

He was treated at first with ergot and hazeline, with occasional doses of adrenalin; later with hazeline and inhalations of amyl nitrite. The last-named seemed to have the best effect in checking the haemorrhage. He was given some quinine whenever there was a chance. He died on August 8th, 1906.

On *post-mortem* examination an old cavity of disintegrating indurated tissue was found in the upper lobe of the right lung, full of blood clot. There were tubercles throughout the lung. The lower lobe showed profuse miliary tubercles. Under the sternum was seen a point of bloody pus. The spleen presented two fibrous scars and a small abscess adherent to the abdominal wall.

Smears from the pus under the sternum and the spleen abscess stained with Giemsa showed no spirochaetes nor other organisms. In the blood from the cavity and in the bloody mucus from a small bronchus of the base no spirochaetes were found. Squash preparations of tuberculous tissue from apex and base showed tubercle bacilli, but no spirochaetes. Smears of the sputum taken before death were again examined, and tubercle bacilli were found.

Other films of the sputum were stained with Giemsa, Romanowsky, carbol fuchsin, and acetone gentian violet (McLennan's formula); all show the same spirochaetes, which were best prepared by the Giemsa. This sputum was dark brown, bloody, and very tenacious.

The spirochaetes were of two distinct types. One stout, strongly stained, and usually of regular waviness; ends tapering, rarely blunt. The other more delicate, with much closer curves, not usually so regular, though straighter and stiffer than the first. The former is apparently *Spirochaeta refringens*; the latter is rather stouter than *Spirochaeta pallida*, the curves rather wider, and it stains with ordinary aniline stains in a few minutes.

To compare the curves of spirochaetes I suggest the use of a ratio—the length in microns divided by the number of curves. Thus, $\frac{10.5}{6}$ and $\frac{9.2}{8}$ represent respectively individuals of the two types above described. By dividing out we get the average curve-length in microns. After measuring forty spirochaetes I found their curve-lengths fell almost entirely within two groups—the first between 1.6 and 1.8 microns, with the length 1.7 occurring most frequently; the second between 1.0 and 1.3 microns, with a great preponderance of the number 1.15. I found that 37 per cent. of the spirochaetes fell into the first group, and 35 per cent. into the second. There were 22 per cent. of all the spirochaetes with a curve-length of exactly 1.15 microns. The curve-length of *Spirochaeta pallida* seemed to be about 1 micron. This smaller spirochaete is, therefore,