likely to remain permanently negative. The authorities of many hospitals did not favour the idea of paying blood donors when it was brought up for discussion, and other arrangements had to be made. With regard to technique, he thought that the method of using citrated blood gave the most certain results in general use. The chief recent advance was the process of immuno-transfusion, introduced by Sir Almroth Wright and his co-workers, in which defibrinated blood was used. The efficacy of this method for patients suffering from severe infections was still *sub judice*. Other methods, such as the Kimpton-Brown tube or multiple syringes, were used with success by some operators, but these were less suitable for general use than citrated blood, which gave perfectly satisfactory results in all surgical cases. No further advances of importance had yet been recorded.

TWO PROBLEMS IN THE TREATMENT OF CLEFT PALATE.

BY

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(a) *The Problem of the Prominent Premaxillary Segment in Tripartite Palate.*

THE beak-like protuberance of the intermaxillary segment in cases of complete double hare-lip and cleft palate is so pronounced, and the strain put upon the sutured edges of the double hare-lip, by suture of both sides simultaneously, is so great that surgeons formerly removed the premaxilla, to abolish tension.

The loss of the incisor teeth, and the tightness and flatness of the new upper lip, as compared with the lower, produced such deformity that removal of the premaxilla has been abandoned. Wedge-shaped excision of part of the nasal septum, accompanied by pressing back the prominent premaxilla, facilitates suture of the lip, and is frequently practised. This inevitably results in tilting of the incisor-bearing segment, and the upper incisors when they erupt will be directed backwards, and, when the mouth is closed, will lie behind the lower ones instead of just in front as they should.

A sliding operation on the septum, though feasible and though allowing normal eruption of the upper incisors in relation to the lower, means unnecessary and perhaps harmful interference with the vascular and nerve supply of the premaxillary segment.

It is not necessary to close both sides of the lip simultaneously. Closure of one side in the first few weeks of life, and of the other about two months later, can be performed without undue tension on the suture lines. This procedure results in normal relation of the upper to the lower incisor teeth owing to the backward pressure of the united lip. Hence no operation on the central segment of the palate is required, for in about two years' time the premaxillo-maxillary cleft is abolished on both sides, and the remainder of the cleft can be treated at the time judged most suitable.

(b) *The Problem of Speech after Cleft Palate Operations.*

In my experience good speech after operations for cleft palate is rare. Closure of the cleft, though difficult, is an easier problem to solve than is that of producing clear articulation.

I firmly believe that the short soft palate, almost inevitable with our recognized methods of closure, is the cause of our failures, and that progress will not be made until we recognize and deal with this difficulty.

I think the cleft soft palate is too small at birth, and that it is made still shorter by paring and suture. Unless the newly formed palate is long enough to shut off, at will, the nasal from the oral cavity, articulation must be defective except for the sounds *m*, *n*, and *ng*. To make such closure possible the surgeon must diminish the gap between the posterior end of the soft palate and the posterior pharyngeal wall. To do this he must either make a longer soft palate or increase the forward prominence of the posterior pharyngeal wall, or do both.

The latter procedure has been advised and performed by Spitzzy and Gratz, who injected paraffin. A fat graft would be preferable, but asepsis would be difficult. Neither method appears likely to come into general use, and hence one's efforts must be directed towards making a soft palate of sufficient length. This can be done only at the expense of the tissues of the hard palate. If much hard palate has to be used to make good the deficiency in the soft, the gap in the hard palate cannot be closed by operation. But, as Mr. Gillies has shown, that defect can easily be made good by prosthetic apparatus.

In short, to my mind, the adoption of methods based on the principles recently enunciated by Mr. Gillies means a real prospect of improvement in our results as far as speech is concerned; the surgical triumph of complete closure of the palate is an empty one if the patient cannot speak clearly.

DISCUSSION.

Mr. C. A. JOLL (London) agreed with Mr. Goyder in deprecating the removal of the premaxilla, but favoured the paring down of the prominence with a sharp knife. This, he claimed, enabled the double hare-lip to be closed in one stage as a rule—a point of importance since the cosmetic result was, in his opinion, better when both sides of the lip could be dealt with together. He had completed a series of 100 operations for cleft palate without a death by the Langenbeck or Smith method. The result of the operation on the speech was not, in Mr. Joll's opinion, so unsatisfactory as Mr. Goyder suggested, though, admittedly, perfect speech was not often achieved. He was not sure whether Mr. Gillies's method would really give improved speech as he had only practised it recently, but up to now he was not favourably impressed.

X-RAY EXAMINATION IN RELATION TO SOME ASPECTS OF PULMONARY TUBERCULOSIS.

BY

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(With Special Plate.)

WHILE the value of the x-ray examination of the chest in cases of tuberculous or of suspected tuberculous disease of the lungs is now well recognized by the majority of clinicians, scrutiny of the records of several thousand radiological examinations of the chest shows that the majority of the cases are sent to the x-ray department merely for confirmation of the clinical findings. When the radiologist is able to confirm the clinical diagnosis of tubercle, the special value of the radiograph lies in the fact that the extent of the lesion is accurately delineated. Prognosis may be markedly influenced by a knowledge of the exact position and extent of cavities, and it is frequently possible to differentiate between the "woolly" mottling indicative of active disease and the characteristic appearance of the quiescent or healed lesion, showing fibrosis or calcification, or both.

It is evident that the radiologist may thus be able to amend the diagnosis and influence the prognosis in cases already labelled positive. Cases tentatively labelled negative and confirmed as such by x rays call for no comment.

It is in the remaining portion of the cases under review that the radiologist's activities become more than supplementary to those of the clinician. Here the radiograph is of paramount importance. Reference to some of the cases detailed below make it clear at once that an x-ray examination may be of such supreme value that a radiologist's report should be obtained wherever there is a shadow of doubt as to the presence of tubercle. I shall endeavour to prove that this is essential in cases where the evidence gleaned from the physical examination of the chest is not sufficient to account for the symptoms.

The group may be subdivided into five types, and I propose to describe these in the order of the frequency with which they appear in the x-ray department.

TYPE I.

In this type the x-ray picture is that of extensive mottling of both lungs, symmetrical in character, with restricted movement of both diaphragms. Such cases may be sent to the department with the request "x-ray of chest for cause of pain below left clavicle," or "x-ray stomach and duodenum for suspected duodenal ulcer," no mention being made of suspected tuberculous disease of the lungs. The following three cases are illustrative.

CASE I.

A male, aged 27, was sent to the x-ray department on November 15th, 1921, for x-ray examination of stomach and duodenum for suspected duodenal ulcer. The patient complained of pain in the stomach half an hour to an hour after food, marked loss of weight, and slight cough and expectoration. The family history was good. He had always been healthy up to two years before examination, when he commenced to have pain after food. He had never vomited and the pain did not tend to become more severe. He stated that he had been examined altogether by over twenty doctors, the majority of whom had examined his chest and told him that there was no evidence of disease. He had been treated during these two years for duodenal ulcer (light diet, etc.), but as he was gradually getting worse he was referred for x-ray examination to confirm the diagnosis. He was extremely emaciated and could only stand for a short period.

On examination of the stomach and duodenum after the test meal nothing abnormal could be detected, and it was evident that no sufficient lesion existed in this region to account for the patient's condition. In the endeavour to find some cause for his cachexia a screen examination of the chest was made. Extensive mottling of both lungs was seen, symmetrical in character, with restricted movement of both diaphragms. The radiograph (Fig. A) confirmed the screen findings, and the report was made that the x-ray appearances of the chest were typical of extensive tuberculous disease of both lungs. The sputum was then examined and found to be positive. The x-ray diagnosis was fully confirmed at the *post-mortem* examination seven weeks later.

CASE II.

A male, aged 56, had always been a great athlete and had been in perfect health up to two years before being examined, when he had a severe attack of "influenza" and was in bed for several weeks. On getting up he found he was very short of breath and could not play more than five or six holes at golf instead of his former thirty-six. His doctor repeatedly examined his chest, but could detect nothing abnormal. Eighteen months after the "influenza" his voice became husky, and he was seen by an eminent physician, who told him his chest was "as sound as a bell." He therefore consulted a laryngologist. The latter found on laryngeal examination that there was double abductor paresis, and that both vocal cords were suspicious of ulceration. He therefore referred the patient to me for radiographic examination of the chest for either aneurysm, new growth, or tuberculous disease of the lungs.

The patient complained of difficulty in breathing, hoarseness, loss of weight, slight cough and expectoration, and pain below the left shoulder-blade. On x-ray examination of the chest extensive symmetrical mottling of both lungs was seen, with very little movement of the diaphragm. The radiograph (Fig. B) is typical of extensive tuberculous disease of both lungs, and a report was sent to this effect. The sputum was then examined and found to be positive.

CASE III.

A male, aged 52, was sent to the x-ray department for examination of the gastro-intestinal tract with the diagnosis of "gastritis." He complained of vomiting and retching in the morning, cough with slight expectoration, pain in the left side of the chest and abdomen, and shortness of breath.

He had been quite healthy up to four years before examination, when he began to suffer from a troublesome cough and noticed he was short of breath. There was retching in the mornings with occasional vomiting. His doctor diagnosed "gastritis," and told him that his lungs were normal. He was treated for gastritis for four years, but was gradually getting weaker and losing weight. During this time his chest had been frequently examined and always pronounced normal.

The radiological examination of the gastro-intestinal tract proved negative, and I therefore examined the chest. I found mottling of both lungs, and reported that the x-ray appearance of the chest pointed to extensive tuberculous disease of the lungs. The sputum was subsequently examined and found to be positive.

I would draw attention in this type to the equal distribution of the disease in both lungs—that is, the symmetrical nature of the lesion. Melville,¹ in a paper on "Pulmonary tubercular disease as shown by x rays but without physical signs," suggests that his cases were not diagnosed clinically because (1) "the presence of slight emphysema tends to mask physical signs, and emphysema was present in certain of my cases," and (2) "abnormalities in the percussion note and in the breath sounds are not readily detectable at a greater depth than about

4 mm. from the lung surface where the area of infiltrated lung is small in extent."

Now in the three cases above quoted there was no evidence to suggest the presence of emphysema, and certainly the lesions were not small in extent; we must therefore look for some other cause to account for the failure to detect these cases clinically. I would suggest that this failure to diagnose cases of symmetrical disease is due to the lack of a basis for comparison between the two lungs. On physical examination the expansion, though diminished, is equal on both sides, the percussion note and breath sounds are similar, vocal fremitus and crepitus are equal; for these reasons the chest is passed as being normal and some other cause is looked for to account for the patient's cachexia.

TYPE II.

My next type is that in which the patient is sent for radiographic examination of the chest to confirm a clinical diagnosis of a tuberculous lesion at one apex. The x-ray examination reveals extensive mottled shadowing of the whole of both sides of the chest with the exception of one apex—the unsuspected one.

CASE IV.

A female, aged 17, was sent to the x-ray department on March 8th, 1924, with the diagnosis "suspected tuberculous disease right apex." She complained of cough, expectoration, night sweats, loss of weight, and shortness of breath. The family history was excellent. She stated that she had been quite well up to six weeks before examination.

Screening demonstrated mottling of both sides of the chest with the exception of the extreme left apex, as shown in the radiograph (Fig. C). The sputum was examined and found to be positive.

CASE V.

A male, aged 36, was sent for x-ray examination of (1) the chest for suspected tuberculous disease of the left apex, and (2) the gastro-intestinal tract for suspected gastric ulcer. He complained of slight cough and expectoration and pain in the epigastrium after food. There was no family history of phthisis. The patient had always been healthy up to four years before examination, when he had had a slight morning cough and expectoration. There was no history of haemoptysis. During the last three months he had lost weight and become very weak.

The radiographic examination revealed extensive mottling of both lungs except at the right extreme apex. Movements of the diaphragm on both sides were restricted owing to the presence of adhesions. The examination of the gastro-intestinal tract after a test meal revealed only simple gastroptosis and enteroptosis.

I have mentioned the examination of the gastro-intestinal tract because the patient's doctor considered this to be the important lesion. He was extremely surprised to learn that I considered that the radiological findings pointed to advanced tuberculous disease of both lungs with the exception of the right apex, and sent the patient to a private sanatorium for confirmation. The findings were confirmed, but the case was considered too advanced for sanatorium treatment. The sputum was found to be positive, and the patient died three months later.

I submit that the lesion is diagnosed at one apex because here there is a basis of comparison on clinical examination. The affected apex shows diminished expansion, dullness on percussion, increased vocal fremitus and resonance, and probably some adventitious sounds. The condition in the remainder of the lungs is missed for the reasons stated under Type I.

TYPE III.

This type is frequently met with in insurance cases. The patient, usually a male, wishes to take out a life insurance policy. Although the physician who examines him can detect no physical signs, he hesitates to give a clean bill of health as possibly the patient has been in a sanatorium for a few months years previously. The radiographic examination in these cases frequently reveals calcareous patches, usually in the region of the apices, pointing to an old healed lesion. The following case illustrates this type.

CASE VI.

A male, aged 42, was referred for x-ray examination of the chest for "any evidence of tuberculous disease of the lungs." The patient looked the picture of health and weighed 203 lb. He stated that seven years before he had been "off colour" for some little time and had spent four months in a sanatorium. He wished to take out a life insurance policy, and the doctor who had examined him stated that he could find no clinical evidence of any tuberculous lesion.

On radiographic examination, however, definite opaque shadows were present at the right extreme apex (Fig. D), pointing to calcification having taken place in a healed tuberculous lesion.

Types IV and V are in an entirely different category.

TYPE IV.

The patient is sent to the x-ray department for examination of the chest for a suspected tuberculous lesion at one apex. The radiograph on the suspected side shows a cervical rib of the type which as a rule joins the first true rib near its sternal end, but the lung itself gives no suggestion of tuberculous disease. One case will illustrate this type.

CASE VII.

A female, aged 25, was sent for radiological examination of the chest with the diagnosis "phthisis right apex." She complained of pain in the right side of the chest, loss of weight, slight cough and expectoration, following influenza eighteen months before. The sputum was negative.

The radiograph (Fig. E) showed the presence of a cervical rib on the right side which almost joins the first true rib in front. There was no suggestion radiologically of tuberculous disease of the lungs.

In this type of case the cervical rib, the presence of which is unsuspected, gives rise to some lagging at the apex, slight dullness on percussion, and rather distant breath sounds, thus simulating an apical tuberculous lesion.

TYPE V.

A chest in which there is a marked degree of scoliosis combined with kyphosis gives rise to considerable difficulty to the physician, especially when he is required to make a negative diagnosis of tuberculous disease.

CASE VIII.

A female, aged 20, was sent to the x-ray department for examination for suspected tuberculous disease of the lungs. She complained of a troublesome cough, slight loss of weight, shortness of breath, and pains in the back. The sputum was negative.

The radiograph (Fig. F) shows a marked degree of scoliosis combined with kyphosis; there is no suggestion of phthisis.

In this type, therefore, the radiographic examination is of supreme value whether negative or positive.

CONCLUSION.

I would emphasize the following points:

I. The importance of the co-ordination of the clinical with the x-ray findings, for in many cases it is by this means alone that we can arrive at a definite and reliable diagnosis and prognosis.

II. The radiological examination should preferably be carried out by a trained radiologist, and it is essential that the x-ray findings and report should be made by him. Only too frequently one finds that in the smaller hospitals, and especially in tuberculosis centres, the x-ray department is left in charge of the house-surgeon or tuberculosis officer, with no training in radiology; they tend to rely on the screen examination or on indifferent radiographs and to make the x-ray appearances coincide with their clinical findings.

III. I would lay stress on the importance of taking a "diagnostic" radiograph in addition to carrying out the routine screen examination, for the sensitive x-ray film will show details which even the practised eye, under the most favourable conditions, fails to detect on the screen. Further, one has a permanent record of the condition, so that if, at any future date, the patient returns for another examination the previous radiograph can be produced and the two compared.

REFERENCE.

¹ *Arch. of Radiol. and Electrol.*, vol. xxviii, p. 23.

THE INDICATIONS AND CONTRAINDICATIONS
FOR ARTIFICIAL PNEUMOTHORAX.

BY

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THERE has recently appeared an article¹ on artificial pneumothorax in which the writer advocates the treatment for cases of early pulmonary tuberculosis, and in which the following sentence occurs:

"I now come to my great point, and it is this, that I think in the future we shall not postpone the induction of artificial pneumothorax until other methods have been given a trial, but we shall carry it out at the earliest possible moment after the discovery, even of early consumption. If the patient refuses the treatment and prefers to try the effect of sanatorium methods or high altitudes first, that must be his affair. As doctors, I think we should advocate the induction of artificial pneumothorax on the affected lung at once, and then encourage the patient to stay in a sanatorium or at a high altitude if there is any suspicion that the other lung is affected."

This opinion raises a highly controversial issue and demands, in my opinion, a challenge.

Dr. Clive Riviere,² who was a pioneer in this subject in this country, and one of its strongest advocates when the treatment was looked upon with indifference or mild amusement, writes as follows:

"A disqualification, even more important in the writer's opinion than that afforded by bilateral disease, exists in the instance of

early phthisis. The application of pneumothorax treatment to these cases can be shown on many grounds to be contraindicated. In the first place it is unnecessary, since early phthisis is a disease readily curable by other methods; in the second place it is inexpedient, since it brings with it risks and the chance of serious complications out of all proportion to the benefits it can confer. Pleural shock and gas embolism are, perhaps, but infinitesimal risks where modern methods are properly applied, but they cannot be altogether eliminated. . . . Furthermore, pleural effusion and the deformities which may follow it are complications which cannot in any way be avoided. Such effusions occur altogether in nearly 50 per cent. of cases, and though the shorter treatment required for slight disease would reduce this percentage, yet effusions must occur in many, and lung expansion fail or be incomplete in a few. Moreover, on re-expansion the pleural layers may become adherent, and the patient be thereby deprived of this treatment at a later stage when it may be truly indicated. In some cases, perhaps, the production of a pneumothorax at an

unusually early stage may be justified on economic grounds, where the cure must be shortened in the case of a patient who is obliged to return to his occupation."

Fishberg³ of New York, in his classic work on pulmonary tuberculosis, writes thus:

"There are some who believe that even incipient cases ought to be treated with pneumothorax. Among these may be mentioned Murphy, Lemke, Bullock and Twitchell, Gray,

Forlanini, von Adelung, Piéry, and some others. Murphy and Kreuscher say: 'Is it well to wait until the outlook is so desolate? Is the lung collapse such a desperate operation as to be used only as a last resort?' With this I am not in agreement. If the treatment lasted only a certain and limited time, the patient could be informed of the details and given the choice. But, inasmuch as we are not in a position to give the patient definite information as to the probable duration of the treatment, and a large proportion of these cases recover under the old and tried methods, we should not subject mild incipient cases to the dangers, complications, and duration of pneumothorax."

FIG. 1.—Before treatment by artificial pneumothorax.

FIG. 2.—After pneumothorax well established.

FIG. A.

FIG. B.

FIG. C.

FIG. D.

FIG. E.

FIG. F.