PROCEEDINGS OF THE THORACIC SOCIETY

The summer meeting of the Thoracic Society was held on July 14 and 15 at the Majestic Hotel, Harrogate. The meeting was composed of three symposia and a number of short papers. Summaries follow.

SYMPOSIUM ON ASSISTED RESPIRATION

M. K. SYKES discussed the technical problems associated with the maintenance of a patient on intermittent positive pressure respiration during the post-operative period. The basic principles of several mechanical respirators were outlined and it was stressed that unremitting medical and nursing care was necessary to prevent technical accidents. The most common complications were discussed and measures designed to obviate these were detailed. The results of treatment were analysed with special reference to patients who had undergone open-heart surgery. It was concluded that assisted respiration was of most value in those patients suffering from a respiratory defect in the post-operative period but that assisted respiration also benefited many patients with circulatory upsets.

PRACTICAL ASPECTS

E. N. O'BRIEN discussed the biochemical assessment of patients requiring management in a respirator. At the Brompton Hospital, London, serial samples of arterial blood are taken and the oxygen saturation, pH, pCO₂, and plasma bicarbonate level determined. The overall acid base state is determined by relating pH to pCO₂ and plasma bicarbonate. By plotting these figures on a pH-bicarbonate diagram it is possible to determine quickly to what degree respiratory and/or metabolic factors contribute to the disordered acid base state and the best method of correction. Metabolic factors are of considerable importance in patients undergoing cardio-pulmonary bypass. The pH-bicarbonate diagram of Davenport was explained and examples of patients assessed in this way discussed.

USE OF A RADCLIFFE RESPIRATOR IN POST-OPERATIVE RESPIRATORY DISTRESS

ALAN GILSTON described the indications for using a respirator in respiratory distress following cardio-thoracic surgery, and the advantages and disadvantages of hyperventilation, rather than curare, to control ventilation, were discussed. The high mortality (60%) in this group of patients reflects their grave condition, and they commonly died from heart failure, renal failure, or brain damage. The indications and method for weaning a patient off the respirator were also discussed. The importance of clinical signs in the management of these patients was emphasized.

ASSISTED RESPIRATION AFTER CHEST INJURY

T. M. WILSON said that the main indication for assisted respiration after chest injury was hypoventilation. The degree of hypoventilation can be assessed only by measurement of pCO₂ and pO₂. Clinical assessment is inaccurate. Clinical experience, however, indicates that chest injuries fall into four broad groups:

<table>
<thead>
<tr>
<th>Group</th>
<th>Injuries</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pulmonary contusion Fore and aft rib fractures</td>
<td>Profound hypoventilation Assisted respiration mandatory</td>
</tr>
<tr>
<td>2</td>
<td>Pulmonary contusion Bilateral rib fractures (other than fore and aft) or unilateral rib fractures plus sternal fracture</td>
<td>Severe hypoventilation Tracheostomy mandatory Assisted respiration probably necessary</td>
</tr>
<tr>
<td>3</td>
<td>Pulmonary contusion Unilateral rib fractures or sternal fracture</td>
<td>Tracheostomy likely to be required Unlikely to need tracheostomy</td>
</tr>
<tr>
<td>4</td>
<td>Rib fractures without serious pulmonary contusion</td>
<td></td>
</tr>
</tbody>
</table>

The successful management of a patient in a respirator demands constant nursing attendance and is best carried out in an adequately equipped intensive care unit where a skilled team can be built up. Particular importance is attached to the control of infection, to the maintenance of clear airways, and to intensive physiotherapy. All members of the nursing team must be familiarized with the catastrophes which can happen to the respirator patient and with the emergency procedures to meet such crises.

TRANSVERSE AXIAL TOMOGRAPHY

J. BLAIR HARTLEY said that this method of producing tomograms was invented in Great Britain. It has been dropped twice, but now has been resurrected at the Christie Hospital and Holt Radium Institute. The complexities are illustrated by the fact that it took 12 months of team-work before the first acceptable film was produced. Thus it is a method suitable only for selected sites and cases, and to be used only in centres where the full team of radiologist, radiographer, physicist, and physics workshop technician can work together.

Thorax (1961), 16, 397.
PROCEEDINGS OF THORACIC SOCIETY

It can be most usefully applied in examination of the post-nasal space and pharynx, the neck, and the thorax. In the abdomen, pneumoperitoneum or retroperitoneal gas insufflation is required before the method can function. Tomograms of the thorax can produce information of great value to surgeon and to radiotherapist, particularly regarding the relatively blind area posterior to the carina.

Such technical advances have been made that the method has become a practical one, and it has a place in the future for all those responsible for making decisions regarding surgical intervention and/or the advisability of radiotherapy.

BYSSINOSIS: STUDIES OF THE ACTIVITY OF DUST EXTRACTS IN MAN AND ANIMALS

C. B. McKerrow and P. J. Nicholls said that the symptoms of byssinosis are accompanied by functional changes in the lungs which can be recognized by serial physiological studies of the cardroom worker during his day's work in the cotton mill, and are apparently due to an active component in the dust.

Inhalation of cardroom dust or of its aqueous extract produces in normal subjects a response similar to that seen in cotton workers. These extracts also cause contraction of isolated human bronchi, and the contractor activity on the guinea-pig ileum of extracts from cotton, flax, sisal, and jute mills ranks these in the same order as the probable severity of byssinosis in these mills.

The possible significance of these observations in the prevention of byssinosis was discussed briefly.

SYMPOSIUM ON ANONYMOUS ACID-FAST BACILLI

BACTERIOLOGY

J. Marks said that routine screening tests were necessary in tuberculosis bacteriology to ensure detection of the anonymous mycobacteria. Strains isolated only once can be presumed to be casual intruders without significance, but those isolated repeatedly, mostly photochromogens or slow-growing non-chromogens, are usually responsible for disease resembling tuberculosis. The anonymous mycobacteria sensitise to tuberculin in varying degrees but are not known to cause many false positive tuberculin reactions in Britain. These organisms are not spread by man; some may be free-living, others derived from animal sources. A number closely resemble M. avium. As the incidence of tuberculosis declines, pseudotuberculosis due to anonymous mycobacteria is likely to become somewhat more common.

PATHOLOGY

E. Nassau reported that resection of post-mortem material was available in 18 of 29 cases consistently showing anonymous acid-fast bacilli in the sputum. The gross pathology and histology in these cases is indistinguishable from that associated with pulmonary tuberculosis. The principal lesions were cavitation, larger solid caseous, caseous pneumonic, and caseous bronchitic lesions. Their only distinguishing feature was the appearance of large cross-branded, acid-fast bacilli in Ziehl-Neelsen stained sections.

In spite of the relative insensitivity of the infecting bacillus, all patients who received six months or more of standard chemotherapy showed more or less marked healing changes in the resected lesions. These again appeared to be much the same as seen in tuberculosis.

The type of disease found in resection material was invariably that of the adult type. The ages of the patients were between 30 and 60 years.

Five children aged 5 to 6 years, from whose sputum a photochromogenic anonymous mycobacterium was isolated on a single occasion only, showed radiological pictures suggesting post-primary lesions.

The pathogenicity of these strains on intramuscular infection in guinea-pigs is of a rather low order. The intracardiac route of infection has been used lately, and, apart from finding the strains more pathogenic, producing widespread lesions in the organs, skin lesions localized around the eyes, snout, paws, and ears were seen. Histologically these were epithelioid cell and lymphocyte collections with scanty acid-fast bacilli.

CLINICAL ASPECTS

J. C. Gilson gave an account of a retrospective study of clinical records from Wales, made by S. R. Kamat, of 57 cases of anonymous infection collected over eight years by Marks. The 57 cases were compared with an equal number of anonymous infection collected over the same period in this county. Pneumoconiosis and a history of mining, haemoptysis, and cavitation are significantly commoner in the anonymous group than in those with tuberculosis. Those with anonymous infection tend to be older. Their response to medical treatment by one or more of the standard drugs, as measured both by sputum conversion and improvement of the area of the shadows in their radiograph, is less good than in those with tuberculosis. Type I (photochromogens) are more often associated with symptoms than type III (non-chromogens). The disease is much commoner in males and there were no instances of two related cases. Mortality and morbidity in terms of time off work was similar in the two groups. Those with pneumoconiosis tended to do worse than those without. The number of contacts per case investigated in the two groups was similar and showed no striking differences in Mantoux positivity.

PULMONARY MANIFESTATIONS OF MUCOVISCIDOSIS (FIBROCYSTIC DISEASE)

E. C. Allibone said that the pulmonary manifestations of mucoviscidosis might be divided into acute forms occurring in infancy and a chronic form in the
survivors. In infancy there is initially an obstructive bronchitis due to the viscid mucus. On this are superadded acute manifestations — bronchiolitis, atelectasis, bronchopneumonia. With continuing bronchitis there gradually emerges a characteristic radiological picture showing prominent hilar shadows and a symmetrical increase of the bronchovascular markings extending throughout the lung field. It involves all four lobes and is progressive. The responsible organism is the Staphylococcus aureus. Its persistence in the respiratory secretions of a patient with chronic pulmonary infection suggests fibrocytic disease. Confirmation is provided by establishing the increase of salt in the sweat.

UNILATERAL EMPHYSEMA OF THE LUNG

John C. Roberts said that of 1,000 children with chest diseases, the majority of whom had primary tuberculosis, some 20 showed unilateral obstructive emphysema of a whole lung at some stage in their illness. The condition is usually a transient phenomenon showing resolution in the majority of cases, but sometimes, despite relief of the obstruction, persistence of the emphysema. The physical signs and the causative factors in the condition were discussed. Illustrative cases were shown.

ANATOMY AND REPAIR OF THE MITRAL VALVE

G. H. Wooler stated that the normal mitral valve was composed of four structures: (1) The valve ring, (2) the cusp tissue, (3) the chordae tendineae, and (4) the papillary muscles.

In mitral incompetence the valve ring dilates and the mural cusp is displaced down to a lower level. The selection of patients suitable for open repair of the valve is important and clinically the ideal patient has a blowing pan-systolic murmur at the apex, an opening snap followed by a third heart sound, and a loudly beginning, very short diastolic murmur. During the past four years open repair has been performed in 28 patients. The repair has been designed to bring the mural cusp up to a higher level so that it can oppose the aortic cusp.

SYMPOSIUM ON CHEST MANIFESTATIONS OF COLLAGEN DISEASE

INTRODUCTION

E. G. L. Bywaters introduced the symposium by saying that lung lesions were seen in rheumatoid arthritis, lupus erythematosus, and scleroderma. In rheumatoid arthritis the majority of lung lesions seen are "common or garden" ailments, but there seems to be an increased incidence: pleurisy and effusion is common. Occasionally interstitial fibrosis is seen, of dubious specificity: nodules are rare except with Caplan's syndrome. Lymphoid hyperplasia has been seen. In lupus erythematosus the main problem is of obliterative pleurisy and its complications, including recurrent infections and fibrosis. In scleroderma the basal fibrosis, which is the most common lesion, is usually associated with dysphagia. Honeycombing is seen rarely, and only very rarely is obliterative arteritis found, similar to that elsewhere in the body.

CLINICAL ASPECTS

N. S. Plummer said that in most cases of polyarteritis nodosa the changes in the lungs were slight, producing few or no symptoms. In the respiratory form of polyarteritis nodosa known as Wegener's granulomatosis, however, granulomas of the upper and lower respiratory tracts dominate the clinical and pathological manifestations of the disease. The clinical picture was illustrated with special reference to the ways in which these cases present with lesions in the nose, throat, and ear (as in cases of midline or malignant granuloma), with haemorrhagic herpetiform skin lesions, and with a variety of radiological shadows in the lungs.

Most patients die of uraemia within a few months, but some have been kept alive with steroid treatment. The probability that the disease exists in a chronic form and may last for 10 years or more was discussed. For chest physicians Wegener's granulomatosis and diffuse interstitial fibrosis of the lungs are the most important of the collagen diseases.

PATHOLOGY

H. Spencer said that connective tissue disorders implied changes not only to collagen but also in the ground substance. As over half the plasma proteins are found in the ground substance, alterations in their composition are likely to affect both elements. Many so-called "collagen diseases" are associated with alterations in the amount and quality of the serum proteins, and these changes may result from abnormal antigen-antibody states. Fibrinoid change can no longer be regarded as diagnostic of these diseases, nevertheless the overlap in both clinical and pathological manifestations of the diseases suggests that they are all closely related. The pulmonary changes found in rheumatoid arthritis, progressive systemic sclerosis, and the Hamman-Rich lung produce a common end-result, a honeycomb lung. Initially oedema of the alveolar walls is later replaced by increasing fibrosis and compensatory bronchiolectasis. In addition in rheumatoid arthritis more specific lesions, such as necrobiotic nodules and Caplan lesions, are also found. Loeffler's syndrome, allergic granuloma, and Wegener's syndrome are in all probability the same disorder varying in severity and extent, and are all characterized by a vasculitis which may be confined to the lungs or may be present as widespread polyarteritis nodosa with terminal acute glomerulitis.
SOME PROBLEMS OF CARDIAC RESUSCITATION IN ACUTE MYOCARDIAL INFARCTION

D. G. Julian reported that of 75 consecutive patients admitted to hospital with acute myocardial infarction, 11 "died" suddenly. Cardiac massage was undertaken in five of these 11 patients. In four of those so treated, sinus rhythm was restored with a satisfactory blood pressure. One patient survives one year later. The remaining three died within 11 days of resuscitation, of complications that can be attributed to avoidable delay in starting treatment and to errors in technique.

It is suggested that if the cardiac rhythm were monitored in all cases of acute myocardial infarction and if all medical and nursing staff were trained in closed-chest cardiac massage and mouth-to-mouth breathing, most cases of cardiac arrest could be treated successfully.

ALLERGIC PNEUMONIA IN CHRONIC ASTHMATICS

J. G. Leopold reported that a pathological study of the lungs from 30 adult cases of chronic asthma dying in status asthmaticus had shown that patchy subpleural areas of non-bacterial pneumonia were common. The pneumonia was of an interstitial type and characterized by an exudate rich in eosinophil cells and serous fluid. The changes become chronic, hence progressively more fibrous, and result ultimately in subpleural scars. The lesions show a strong predilection for the upper half of the lung. Saccular bronchiectasis, which was found in four of the cases, follows the same distribution and is attributable to the scarring caused by eosinophil-cell pneumonia.

THORACOSCOPY IN THE DIAGNOSIS OF PLEURAL EFFUSION

M. Meredith Brown said that when other measures have not established the diagnosis of a persistent effusion thoracoscopy may help. Cytology is unreliable; culture for tuberculosis is slow; fluid obscures radiographic details; and pleural biopsy is a blind procedure. The present technique includes general anaesthesia, evacuation of fluid, inspection after letting air in, biopsy through a second cannula, and catheter drainage to secure full expansion.

Of 43 cases, 26 were malignant and 17 benign. In only six did radiographs show a lung or mediastinal lesion. The fluid was bloody in 14; five of these were benign. There was no mortality or complications, but in one thoracotomy was necessary. In many cases there was no further formation of fluid; in others it was delayed. Thoracoscopy may help in deciding whether to advise thoracotomy for bronchial carcinoma with effusion.

CHEST INJURIES IN CHILDHOOD AND ADOLESCENCE

B. J. Bickford said that chest injuries in childhood and adolescence are uncommon. Sixteen cases were admitted to the Liverpool Thoracic Surgical Centre in 17 years (17,000 admissions), and eight to Alder Hey Children's Hospital in 10 years (90,000 admissions). There were three simple rib fractures, 11 closed injuries with damage to the lung or air-passages, and 10 penetrating wounds. All the rib fractures and eight of the closed injuries were due to road accidents (only one was a passenger). Eight of the penetrating wounds (seven from spikes) came through childhood activities or inexperience. One was due to an air-raid and one to a road accident.

Compared with adult injuries, the incidence of penetrating wounds is high.