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ABSTRACTS

This section of THORAX *is published in collaboration with the two abstracting journals, Abstracts of World Medicine, and Abstracts of World Surgery, Obstetrics and Gynaecology, published by the British Medical Association. In this Journal some of the more important articles on subjects of interest to chest physicians and surgeons are selected for abstract, and these are classified into five sections: experimental; tuberculosis; neoplasm; asthma; thoracic surgery. Each section is not necessarily represented in any one issue.*

Experimental

Antibiotics and Chemotherapy

Aureomycin in the Treatment of Primary Atypical Pneumonia. FINLAND, M., COLLINS, H. S., and WELLS, E. B. (1949). *New Engl. J. Med.*, **240**, 241.

As aureomycin is a proved effective agent against many diseases with a virus aetiology, the authors tried its effects in 20 consecutive cases of severe primary atypical pneumonia. A capsule containing 1 g. of crystalline aureomycin hydrochloride was given every four to six hours until the temperature became normal and every six to eight hours for an additional two or three days. They describe the clinical and pathological features of the cases treated and note that cold agglutinins in a titre of 1 in 160, or higher, were found in all cases. They found that the temperature fell to normal in all cases within 36 hours of administration of the first dose and no relapse occurred. This fall was accompanied by loss of toxic symptoms and improvement in the lung lesion. Résumés, with comments, of the case histories of four patients are given.

Evaluation of Therapeutic Substances Employed for the Relief of Bronchospasm. V. Adrenergic Agents. BRESNICK, E., BEAKEY, J. F., LEVINSON, L., and SEGAL, M. S. (1949). *J. clin. Invest.*, **28**, 1182.

To provoke bronchospasm in asthmatic patients histamine diphosphate and methacholine chloride were given, either intravenously or as aerosols, and the reduction of the vital capacity taken as a measure of the bronchospasm so produced. Antispasmodic substances were then given beforehand, and the degree of protection afforded by them at any given time after injection expressed by the percentage diminution in the degree of bronchospasm produced by histamine or methacholine alone. Protection was regarded as "significant" if this figure was at least 40% and "complete" if the vital capacity was not decreased by the spasmodic substance at all.

Adrenaline subcutaneously (0.5 ml. of 1 in 1,000 solution) and as a 1% aerosol, and a 2.25% aerosol of "vaponefrin" (a racemic adrenaline) protected well against both spasmodic substances, the injection having a longer effect than the inhalations. "Neosynephrin" by subcutaneous injection (0.3 ml. of 1% solution) and as a 1% aerosol had almost no protective effect. *Iso*propylnoradrenaline as a 1% aerosol gave better protection than any other substance, whereas the 0.5% aerosol was only slightly superior to 1% adrenaline. When this substance was given subcutaneously (0.5 ml. of a 1 in 5,000 solution), however, the protective effect was much shorter than with adrenaline. Given sublingually (20 mg.) there was hardly any protective effect. Ephedrine orally (25 mg.) required more than an hour to become effective and the protection afforded was not as great as with the other substances mentioned. It lasted for four to five hours and was a little more effective against histamine than against methacholine. "Orthoxine" (a substance related to ephedrine) was also given orally (200 mg.) and had a similar effect.

Evaluation of Therapeutic Substances Employed for the Relief of Bronchospasm. VI. Aminophylline. SEGAL, M. S., LEVINSON, L., BRESNICK, E., and BEAKEY, J. F. (1949). *J. clin. Invest.*, **28**, 1190.

The protective effect of aminophylline against the broncho-spasmodic effect of histamine and methacholine in asthmatic subjects was investigated by the methods used in the preceding paper. Its effect was not as strong as that of adrenaline and related substances, but it was nevertheless significant, and lasted longer (from three to six hours). Rectal administration proved slightly superior to the intravenous route, and both were much more efficient than the intramuscular and oral routes. A 25% aerosol proved to be quite useless.

Pharmacodynamics of Pulmonary Absorption in Man. I. Aerosol and Intratracheal Penicillin. GAENSLER, E. A., BEAKEY, J. F., and SEGAL, M. S. (1949). *Ann. intern. Med.*, **31**, 582.

In order to study the various factors affecting the absorption of penicillin administered as an aerosol and intratracheally in man, three sets of experiments were carried out. In the first, 100,000 units of crystalline penicillin G (potassium salt) dissolved in 1 ml. of saline was injected intramuscularly in 10 normal subjects. The blood level and urinary excretion of penicillin were determined in each and the results proved fairly uniform. Significant blood penicillin levels were maintained, on the average, for three hours only. The urinary penicillin content was high in the first hour, averaging nearly 30% of the dose, and fell off rapidly afterwards, a total of 47% being excreted in 24 hours, a value somewhat below that generally reported. In the second experiment the same amount of penicillin, dissolved in 10 ml. of saline, was injected endotracheally through a nasal catheter under local analgesia in nine normal subjects and similar observations were made. Again, the results were reasonably uniform; it was found that the highest blood penicillin level was obtained, on the average, at the end of two hours from the injection and significant levels were maintained for six hours. The blood penicillin level at the end of the first hour was about one-eighth of that after intramuscular injection, while the urinary excretion of penicillin was correspondingly lower in the first hour (8%) and fell off much more slowly. The total excretion in 24 hours was only 16% of the dose of penicillin injected. In the third experiment, 12 subjects received 100,000 units of penicillin in 1 ml. of saline by means of a nebulizer with a rebreathing bag. At the end of half an hour the average blood penicillin level was almost the same as that after endotracheal injection, but it fell off much more rapidly, the value being insignificant three hours after injection. The urinary findings corresponded closely, only 5.5% of the dose being excreted in 24 hours.

These experiments show that the lung epithelium can absorb penicillin, given intratracheally, effectively but slowly, the lung acting as a depot, with maintenance of a significant concentration in the blood over a prolonged period. However, as this process requires abolition of the cough reflex, it cannot be regarded as suitable for general use in broncho-pulmonary disease, although, however, it might be used with advantage in special conditions. Aerosol administration gives a peak blood level of penicillin of the same order as that after endotracheal injection, but a significant level is maintained only for a short time. Comparison of the results obtained in the last two experiments shows that only about one-third of the penicillin given as an aerosol reaches the lung, the remainder being lost within the apparatus or into the air by expiration or other routes. *Reginald St. A. Heathcote.*

Localization of the Site of Action of a Pulmonary Irritant, Diphosgene. TOBIAS, J. M., POSTEL, S., PATT, H. M., LUSHBAUGH, C. C., SWIFT, M. N., and GERARD, R. W. (1949). *Amer. J. Physiol.*, **158**, 173.

Experiments were carried out on dogs anaesthetized with "nembutal" to determine the site of action of inhaled diphosgene. Evidence from unilateral inhalation studies, crossed circulation and transfusion experiments, and parapulmonary administration showed that the inhaled substance itself acted only in the lung, pathological changes in other organs being secondary to this. No evidence was found of a circulating toxin, but the damaged lung might liberate thromboplastin and substances increasing capillary permeability into the oedema fluid. Bronchiolar narrowing occurred soon after exposure and accounted for the early emphysema. No clear evidence was obtained of alveolar damage. Death after moderate, but invariably lethal, doses was due to gradual development of anoxia with pulmonary oedema; death after massive doses was immediate and due to occlusion of the pulmonary circulation by intravascular clotting and acid haemolysis.

R. A. Gregory.

Respiratory Function

Respiration and Circulation in Pulmonary Anoxemia. TAQUINI, A. C., FASCIOLO, J. C., SUAREZ, J. R. E., and CHIODI, J. (1948). *Arch. intern. Med.*, **82**, 534.

This is an omnibus study of 18 patients with different degrees of pulmonary fibrosis and emphysema. A variable number of them were also described as suffering from Ayerza's syndrome. This latter condition is not precisely defined. A number of the techniques employed (cardiac output determination by Grollman's method, tonometer studies for oxygen and carbon dioxide tension determinations, direct alveolar sampling) have been effectively criticized for a number of years. This the authors admit, but compare their results with those obtained by others with similar methods. The estimations of cardiac outputs in cor pulmonale by the now accepted technique of cardiac catheterization are mentioned only briefly, as not allowing for further consideration in relation to their (the authors') criteria. Alveolar air, gas distribution in the lungs, pulmonary ventilation,

simulated increase in dead space and lung volumes, are determined and discussed in relation to past findings and present theory. A remark that "individual differences in lung volumes can be explained on the basis of prevalent emphysema or fibrosis in the lungs" emphasizes the unfruitfulness of attempting to study so many different problems in one series of investigations. Arterial blood-gas content and tension studies revealed the usual findings in these types of cases. The discussions on the alveolar-arterial gradient and on haemorespiratory exchange is of interest, but a number of the statements cannot be accepted, particularly those which infer that the diffusion coefficient is unaffected by changes in cardiac output and pulmonary circulation. The diminution of ventilation with oxygen and the modified stimulating effect of carbon dioxide in these cases were also demonstrated. Circulation times were studied. Blood volume findings agreed on the whole with present knowledge. The suggested correlation between polycythaemia and anoxia is not convincing. This article is of interest to workers on cardiopulmonary function in chronic lung disease, mainly as a critical exercise. *K. W. Donald.*

Arterio-venous Anastomoses in the Pulmonary Circulation. IV. Arterio-venous Anastomoses in Visceral and Parietal Pleura and Pleural Adhesions; Data on Histogenesis of Occluding Arteries. RIKIND, A. V. (1949). *Arkh. patol.*, **11**, No. 4, 62.

The author has described and discussed arterio-venous anastomoses in the lungs in his previous papers. The occluding arteriole which serves as a functional link in such anastomoses is also found in the visceral and parietal pleura, the diaphragm, and the sub-peritoneal fat of the abdominal surface of the diaphragm, and in the adhesions between the two layers of the pleura, when such adhesions exist. Their development can be traced to the granulation tissue formed at the site of old inflammatory lesions, but they can also be formed by the functional adaptation of pre-existing arterioles.

L. Crome.

Tuberculosis : Clinical

***Candida* in Sputum of Patients with Tuberculosis.** [In English.] SCHWARTING, V. M., and SKINNER, C. E. (1949). *Mycopathologia, Amst.*, **4**, 349.

Fresh samples of sputum from patients with pulmonary tuberculosis were cultured on glucose–tartaric-acid–beef-peptone agar at *p*H 3.8. After isolation, cultures were stabbed in beef-peptone gelatin to exclude non-mycelial yeasts. Of 500 sputa 107 contained yeasts, of which eight were found to be non-mycelial, the remaining 99 being of the genus *Candida*. This gives an incidence of 20%. Out of the 99 cultures of *Candida*, 67 were selected at random and studied in greater detail. A yeast which produced mycelium, blastospores, and terminal chlamidospores when cultured on corn-meal agar, and fermented glucose, galactose, and maltose with production of gas, sucrose with production of acid only or occasionally a bubble of gas, and lactose not at all, was considered to be typical *C. albicans*. It was estimated that 17% of all the samples examined contained *C. albicans*. The incidence of *Candida* in relation to the form and extent of the pulmonary tuberculosis, with particular reference to the presence or absence of cavitation, was examined statistically. The result was rather surprising, as *Candida* did not occur more frequently in advanced cases with cavitation than in less advanced cases without cavitation, a finding which is contrary to generally held opinion. The view that malnutrition and debilitating disease predispose to moniliasis may have to be reconsidered.

E. Nassau.

Contralateral Relapse of Tuberculosis in Patients Subjected to Unilateral Collapse Therapy. VARSVIK, P. (1949). *Nord. Med.*, **42**, 1158.

In patients with pulmonary tuberculosis who have undergone satisfactory unilateral collapse therapy a cavity often develops on the other side. The present series consists of 102 patients admitted to Glittre Sanatorium, Hakadal, Norway, in 1946–8, who had cavities in one lung, the other lung having previously and satisfactorily been collapsed elsewhere, and 27 patients who had undergone a satisfactory collapse of one lung at Glittre in 1940–3 and were subsequently admitted with a cavity on the other side.

The author estimates that this sequence is found in 20% of cases though his records are not yet complete. In calculating the period of freedom between the satisfactory collapse and the appearance of evidence of progressive disease on the other side, he takes as the first date that when the patient became sputum negative after ideal or satisfactory collapse of lung, and as the last date that when he became sputum positive or on which radiological or other evidence of disease appeared in the other lung. This free interval was most commonly 12 to 18 months; in two-thirds of the cases contralateral cavities developed after 12 to 36 months. The interval tended to be shorter when the pathological changes in the other lung were minimal at the time of collapse.

As cases of contralateral cavitation tend to appear after the same interval and without demonstrable external cause, the author suggests that this

phenomenon is part of the pattern of the disease, due possibly to a change in the immunity reactions of the patient.

Disseminated Coccidioidomycosis and Lymphohematogenous Tuberculosis. Report of a Case. HYDE, B., and HYDE, L. (1949). *Arch. intern. Med.*, **83**, 505.

Coccidioidomycosis is endemic to large areas of the south-western United States. The primary pulmonary infection is usually asymptomatic, localized, and self-limited. The usual course is uncomplicated, the primary focus heals, and the only evidence may be a positive reaction to coccidioidin applied intradermally. Another type may be associated with symptoms of infection of the upper respiratory tract or influenza. The clinical history and pathological features of coccidioidomycosis may resemble those of pulmonary tuberculosis and the conditions may be indistinguishable radiologically. Disseminated coccidioidomycosis is rare; lesions may develop in the skin, meninges, lymph nodes, bones, joints, or peritoneum, the clinical picture being similar to that of lymphohaematogenous tuberculosis.

The authors present a case in which the two conditions co-existed, and they show the similarities and differences of the two conditions. This detailed study definitely proves the co-existence of coccidioidomycosis of the lungs, peritoneum, left shoulder-joint, right ankle, skull, and dura; and of tuberculosis of the lungs, hilar lymph nodes, liver, spleen, kidneys, peritoneum, adrenals, prostate, sternum, pericardium, and ileum.

During life smears and cultures of gastric contents contained acid-fast bacilli, and cultures from the abscess of the foot contained *C. immitis*. At necropsy both *Mycobacterium tuberculosis* and *C. immitis* were found in the lungs, omentum, and peritoneum. Only acid-fast bacilli were found in the liver, spleen, kidneys, adrenals, prostate, seminal vesicles, sternum, and pericardium. Only *C. immitis* were obtained from the left shoulder, ankle, skull, pleura, and abscesses in subcutaneous tissues.

Neoplasm

Cancer of the Lung. Review of a Thousand Cases. MASON, G. A. (1949). *Lancet*, **2**, 587.

This is an extremely comprehensive review of 1,000 cases of carcinoma of the lung investigated and treated at regional thoracic centres in Newcastle-upon-Tyne and Nottingham since 1933. The numbers per year have increased from a mere handful in 1933 to over 200 in 1948, but the author is not convinced that there has been a real increase in the incidence of the disease. Extensive propaganda and mass radiography, although undoubtedly playing a part in bringing cases to light, have not led to the hoped-for increase in the number of early and operable cases seen. There is still an average delay of 8.4 months from the onset of symptoms to admission to hospital, and of this period five months is due to delay in diagnosis by the doctor.

In 90% of the cases the patient was a male, the right lung was affected slightly more often than the left, and the upper more frequently than the lower lobe. There was no special relation between age and differentiation or between site and histology of the tumour. Cough and pain were the most frequent early symptoms, occurring in 31% and 24% respectively. An initial haemoptysis was recorded in only 7%. Unresolved pneumonia, delayed resolution, infarcts, effusions and empyemas, chronic lung abscess, and hypertrophic pulmonary osteo-arthropathy are all conditions in which the possibility of an underlying carcinoma should be suspected.

Radiological investigation is of extreme importance; in 64% there was evidence of collapse of either a lung or a lobe; hilar shadows were seen in 17%, and in 10% the appearances were those of a cavity with fluid. In only 4% were solitary tumours in the lung periphery discovered. In the remaining cases apical fibro-cavernous tuberculosis was simulated or there was massive effusion. Bronchoscopy is an essential routine investigation; although many tumours are beyond the range of vision, important information about the state of the mediastinum is obtained.

Exploratory thoracotomy is advised in all cases without obvious contraindications such as clinical or radiological evidence of dissemination, poor general condition, close proximity of the growth to the main carina, advanced age, emphysema, or arteriosclerosis. Diaphragmatic paralysis should not be regarded as a contraindication, but no case with a laryngeal palsy has yet proved operable. Effusions should not be regarded as evidence of inoperability, particularly as the parietal pleura can be removed with the lung. Invasion, however, of the parietal chest wall has always been followed by recurrence soon after removal.

Of the 1,000 patients, 353 underwent exploratory thoracotomy and resection was carried out in 202 instances. In 54 in the latter group death occurred within a month of operation. Fistula formation and empyema are still the most important local complications, though their incidence has fallen markedly since the introduction of chemotherapeutic agents. Of the survivors, four out of 33 are alive four and a half to seven years

after operation and nine out of 57 are alive three to four years after.

X-ray therapy has been given to those who have refused surgical treatment, those whose tumours were found to be inoperable on exploration, those considered unsuitable for operation, those with undifferentiated growths, and those in whom nodal involvement was encountered at operation. The results are given in table form without attempt at analysis. There is no doubt that great symptomatic and radiological improvement often follows a course of *x*-ray therapy. Three types of course were used: (*a*) radical—4,500 to 5,500 r over five to six weeks; (*b*) palliative—2,500 to 3,000 r in three weeks; (*c*) single application of 500 r in cases with mediastinal obstruction, supplemented later with further doses as indicated.

For palliative treatment morphine, cocaine, and alcohol offer reasonable relief and make existence tolerable, but nerve-blocking or even cordotomy may be required for severe pain. Phrenic paralysis may prevent the severe intractable dragging sensations which sometimes develop. Palliative pneumonectomy deserves consideration, especially in cases of pulmonary osteo-arthropathy.

W. P. Cleland.

Carcinoma of the Lung. A Follow-up on Sixty-seven Patients Subjected to Pneumonectomy. BURNETT, W. E., ROSEMOND, G. P., and HALL, J. H. (1949). *J. thorac. Surg.*, **18**, 679.

Out of a total of 429 patients with carcinoma of the lung seen by the authors between 1936 and 1948, exploration was carried out in 149 cases (34.7%) and in only 67 cases (15.6%) was resection found possible and pneumonectomy performed. Of these 67 patients with whom this report is concerned 18 (27%) died in hospital, and of the remainder 27 have since died, 22 of them from metastases (the follow-up period ranges from six to 99 months). The 22 patients still alive represent 32.8% of those undergoing pneumonectomy, but only 4.7% of the original 429 cases. Of these 22, only 11 have survived the operation for two years or more.

The operative technique generally employed was a fairly standard type of dissection pneumonectomy without routine block dissection of the mediastinal tissues, though these structures and the pericardium were removed where indicated. Chemotherapy was used extensively both systemically and locally and since its introduction mortality from infection has been considerably reduced. The pre-operative preparation recommended involves a careful cardiological survey as the majority of deaths are, at present, due to cardiac failure. It includes an electrocardiogram and an overload test consisting in the intravenous injection of 10 ml. of saline per pound (0.45 ml. per kg.) of body weight in 30 minutes, venous pressure and circulation time being recorded before and after the injection. [No guide is given as to interpretation of the results.] Post-operative care includes bronchoscopy where indicated for excessive bronchial secretion, low fluid intake, and unhurried ambulation. Otherwise, treatment is symptomatic. *W. P. Cleland.*

Bronchiogenic Carcinoma. [In English.] LIAVAAG, K. (1949). *Acta chir. scand.*, **98**, 182.

A statistical review is given of the 80 cases of bronchogenic carcinoma treated at the University Surgical Clinic, Oslo, during the period 1936–48. There were twice as many men in the series as women, the patients being mostly between 40 and 60 years of age, the youngest being 19. The carcinoma was situated in the right lung in 48 cases and in the left in 32, while in 53 the growth was classified as "central." The histology was ascertained in 75% of the growths, which were made up of squamous-celled, anaplastic and adenocarcinomata, the first two being of equal incidence. Cough was the commonest symptom, with loss of weight, dyspnoea, haemoptysis, pain, or infection as frequent concomitants. Dry cough was also the most usual first symptom. On average, the duration of symptoms was eight and a half months and the doctor was consulted after two months, so that there was an average delay of six and a half months before diagnosis, often due to masking of the signs by secondary infection. The importance of radiology in diagnosis is emphasized: bronchography or tomography were usually employed, the latter being found especially helpful, but not so valuable as bronchoscopy, which was carried out in 67 cases, some abnormality being found in 53. Biopsy was taken when possible, but sputum examination was not employed. Needle biopsy, although carried out twice, is not recommended.

Pneumonectomy was considered to be the treatment of choice; lobectomy was performed on one older patient with poor reserve. The contraindications accepted were: poor general condition, presence of metastases, invasion of mediastinum, ribs, or carina, phrenic or recurrent laryngeal nerve paresis, and pleural effusion. Operation was performed in 44 cases, consisting of thoracotomy only in 23. Dissection technique, without opening the pericardium, was usually used, the bronchus being closed with a continuous linen suture and buried. There were 71 post-operative deaths among the 21 patients subjected to radical operation; 10 of those surviving are still alive, four of them more than five years later. In two of these four cases, the growth was anaplastic and in one there were metastases in the hilar glands. *M. Meredith Brown.*

Tumors of the Mediastinum. A Discussion of Diagnostic Procedure and Surgical Treatment Based on Experience with Forty-four Operated Cases. BREWER, L. A., and DOLLEY, F. S. (1949). *Amer. Rev. Tuberc.*, **60**, 419.

Many mediastinal tumours are now discovered by mass radiography. The authors present a plan for investigation of such cases. Symptoms may be neurological, respiratory, gastrointestinal, vascular, or miscellaneous. Early tumours give no physical signs. Special procedures include tomography, bronchoscopy, use of contrast media in lung or oesophagus, tests for specific granulomata, biopsy examination of accessible lymph nodes, trial *x*-ray therapy, or surgical exploration. The clinical and radiological findings in cases of the common benign mediastinal tumours are discussed. Since all mediastinal tumours are potentially malignant and *x*-ray therapy is ineffective except for lymphoid tumours, surgical removal of the tumour is definitely indicated. The golden opportunity for removal occurs when the lesion is discrete and symptoms are minimal or absent. Then the risk of operation is slight and the chance of cure high. *John Borrie.*

Thoracic Surgery

The Resected Postthoracoplasty Lung. A Clinico-Pathologic Correlation. MEISSNER, W. A., OVERHOLT, R. H., WILSON, N. J., and WALKER, J. H. (1949). *Amer. Rev. Tuberc.*, **60**, 406.

Of 323 pulmonary resections performed between 1934 and 1948 for tuberculosis, 64 were carried out because thoracoplasty had failed. Of these 62 are reviewed. In an attempt to find the reason for failure of thoracoplasty, the authors have correlated the clinical picture with pathological findings.

The sites and types of active tuberculosis and anatomical causes of failure of collapse therapy were analysed, and a clinical follow-up study and review of post-operative radiographs were carried out in all but eight cases. Because it was found that the distribution of disease in cases of thoracoplasty failure usually renders such cases unsuitable for lobectomy, 45 pneumonectomies were performed. In three cases segmental resection was performed in combination with lobectomy, because of poor reserve of the patient and contralateral disease. The age of patients varied from 19 to 49, with 50% between 30 and 40. There were 41 women and 21 men. The duration of illness varied from 15 months to 30 years. As 37% had been ill for over two years, 40% from five to 10 years, and 18% over 10 years, the surgical treatment was carried out predominantly in middle-aged patients with long-term illness. Previous collapse measures are mentioned.

Endobronchial tuberculosis was demonstrated at bronchoscopy in 23 cases; in 15 it was obstructive in type, in six ulcero-stenotic, and in nine fibrostenotic. No stenotic lesion was seen below the dorsal division of the lower lobes.

Three types of disease were seen in the resected lungs: (*a*) active tuberculous cavitation; (*b*) endobronchial tuberculosis; (*c*) extensive parenchymal tuberculosis. In 50 specimens there were cavities and in five the latter were multiple. The commonest site of cavitation was the apical posterior segment of the upper lobe. The average diameter was 2 to 3 cm. Endobronchial disease fell into three groups: (1) stenosis (either hyperplastic or fibrous); (2) tuberculous bronchiectasis; (3) diffuse mucosal and submucosal disease. Nine patients had extensive parenchymal disease usually associated with other lesions. The presence of thick fibrous cavity walls, thick pleura, lower lobe cavities, or severe endobronchial disease of stenotic or bronchiectatic type precluded successful thoracoplasty.

Amongst clinical causes of failure of thoracoplasty inadequate surgery held pride of place (40 patients). Unfavourable size, site, or number of cavities was responsible in 36 cases, exudative disease at the time of operation in 11, and spread to the base in four. It was difficult from study of pathological specimens alone to distinguish between the cause of failure and manifestations of failure. To correlate clinical and pathological findings proved the best method. *John Borrie.*

Phrenic Nerve Interruption in the Treatment of Pulmonary Tuberculosis. II. Complications and Sequelae of Phreniclasis. MITCHELL, R. S. (1949). *Amer. Rev. Tuberc.*, **60**, 168.

This is a review of the complications and sequelae of therapeutic phrenic nerve interruption carried out on 538 patients with pulmonary tuberculosis at Trudeau Sanatorium and others around Saranac Lake, New York. Much of the argument centres round the accurate assessment of paralysis. With the usual method of estimation by fluoroscopy in the erect position the criteria of paralysis are: no descent, or paradoxical rise, of the diaphragm on quiet inspiration, limitation of descent on full inspiration after forced expiration, and paradoxical rise on inspiratory sniff. But the author found that recumbency increased the diaphragmatic excursion both in the affected and unaffected hemidiaphragm and, when function was beginning to return, a more nearly normal response to sniffing was obtained in the recumbent than was found in the erect position. He considers the most

reliable signs of paralysis to be absent or paradoxical motion on quiet breathing and a paradoxical response to inspiratory sniff, in each case when the patient is recumbent.

It would appear that if the nerve is adequately dealt with, the paralysis after phreniclasis should last not less than four months. At a first operation an unsatisfactory result was obtained in 11% of cases in which no accessory nerve was found and in 5% of those in which at least one was found and cut. Failure to achieve satisfactory paralysis occurred in 9% of 361 cases after a first, in 14% of 110 after a second, and in 27% of 15 after a third operation. A diaphragm "temporarily" paralysed is unlikely to recover if it has not done so within 18 months. Of 136 patients examined two years or more after their first operation 26% had persistent partial loss of diaphragmatic function and 6% total loss. After multiple phreniclases the corresponding figures were 35% and 11%. The incidence of permanent disability was higher in the older age groups and in those with left-sided paralysis. In those cases in which the diaphragm recovered, the mean and median duration of paralysis was between 6½ and 9½ months. The author states that complications are few and usually of a minor character. *J. V. Hurford.*

Phrenic Nerve Interruption in the Treatment of Pulmonary Tuberculosis. III. The Effect of a Paralysed Hemidiaphragm on the Results of Homolateral Thoracoplasty. MITCHELL, R. S. (1949). *Amer. Rev. Tuberc.*, **60**, 183.

Of 103 patients of Trudeau Sanatorium, New York, treated by thoracoplasty for pulmonary tuberculosis up to the end of 1944, 55 had previously undergone homolateral phreniclasis. Of these 14 showed diaphragmatic recovery before operation and, together with the unparalysed 48, were regarded as a control group. Comparison of the results of thoracoplasty in this group with those obtained in the group of 41 patients with partial or total paralysis showed that there was little difference in the incidence of immediate postoperative spread of disease. Homolateral "atelectasis" occurred in 10% (four cases) of those with a disabled diaphragm at the time of operation and in 1.62% (one case) of the controls. Late results were more favourable in the unparalysed group.

[The figures are open to criticism on statistical grounds: (1) Of the 41 patients in the paralysed group, 13 underwent exeiresis before 1934 and thus were amongst the earliest cases in which thoracoplasty was performed—it is not stated whether any or all of the cases of atelectasis cases occurred amongst these patients. (2) There was a greater proportion of far-advanced cases in the group with a paralysed diaphragm before surgery.] *J. V. Hurford.*

Chronic Tuberculous Pyothorax and its Treatment. BERNOU, A., GOYER, R., MARECAUX, L., and TRICOIRE, J. (1949). *Pr. méd.*, **57**, 858.

If cases of pyothorax are left untreated they all too frequently end in lardaceous disease and death. The various methods of surgical treatment are discussed from simple puncture and aspiration, lavage and artificial pneumothorax refills to thoracoplasty. A brief description is given of 248 patients with pyothorax sent to the authors for surgical treatment. Of these 70 were cured by thoracoplasty with or without aspiration. Most of these cases were fairly recent, only a small number of patients having had the condition for periods ranging from two to twenty years. Of the remaining 178, the operation of pleurectomy with or without preliminary thoracoplasty was performed in 110, with successful results in 60% of cases. The operative technique is not described, but the authors stress the importance of always treating with galvanocautery or diathermy coagulation the tuberculous lesions of the visceral pleura and the subjacent lung. *S. Roodhouse Gloyne.*

A New Method of Treating the Tuberculous Cavity. (Intracavernous Thiosemicarbazone Therapy). MALLUCHE, H. (1949). *Beitr. klin. Tuberk.*, **102**, 321.

The author has modified Maurer's cavernostomy by resecting 6 to 10 cm. of the 1st and/or 2nd rib anteriorly. The internal leaf of the periosteum is painted with 10% formalin. If, after two to four weeks, the two pleural layers are safely fused a Monaldi drainage tube is inserted. Cavity contents are aspirated by syringe daily; 0.1 g. Tb I/698 in 10 to 20% oily suspension is injected into the cavity through the drainage tube. At the same time systemic treatment is started with 0.1 g. Tb I/698 per day orally. Only 10 to 14 days after insertion of the drainage tube the author starts suction-drainage very carefully with a low negative pressure. Haemorrhage is possible, since Tb I/698 apparently diminishes the bleeding time. The author does not think that the Monaldi drainage *per se* contributes a great deal to the diminution of the cavity.

[The results of this treatment after 3 to 12 months do not seem to be superior to what might be expected from a Maurer cavernostomy with intracavitary application of streptomycin or *p*-aminosalicylic acid.] *E. G. W. Hoffstaedt.*

Influence of Type of Disease on the Results of Thoracoplasty in Pulmonary Tuberculosis. RUBIN, M., and KLOPSTOCK, R. (1949). *Amer. Rev. Tuberc.*, **60**, 273.

The results of thoracoplasty performed on 168 patients in a period of five years are summarized, excluding those carried out for empyema. The disease involved is classified into six different clinico-pathological types: (1) fibrocaseous tuberculosis; (2) fibroid tuberculosis; (3) caseo-cavernous tuberculosis; (4) tuberculosis associated with thin-walled cavities; (5) tuberculosis and bronchiectasis; (6) the unexpandable lung.

The authors discuss the late results in the series as a whole and in each group individually. Thoracoplasty was carried out in stages, its extent depended on the site of disease, and apicolysis was performed in "selected" cases only. Cavity closure was achieved in 76.8%; over-all mortality was 5.3%. The best results were obtained in cases of unilateral fibrocaseous disease (this was the largest group)—88% success, 2% mortality. Results in cases with giant thin-walled or thick-walled cavities were poor—60% success with a 19.6% mortality. *J. R. Belcher.*

Decortication of the Unexpanded Tuberculous Lung Following Pneumothorax. WEINBERG, J. A., and DAVIS, J. D. (1949). *J. thorac. Surg.*, **18**, 363.

Decortication for tuberculous empyema is an operation about which divergent views are held. It can certainly be achieved successfully in tuberculous patients, but there is some risk that re-expansion of the lung may lead to activation of underlying tuberculous processes. The authors feel that these risks are exaggerated and that in spite of some inevitable fibrosis in the lung fields fair or good recovery of lung function may be expected. Streptomycin is probably a valuable prophylactic against any spread of infection during surgery.

The decortication is probably best carried out by turning the operation into a complete pleurectomy, the parietal pleura being first freed and the dissection carried round the marginal ring to the lung surface. This may make the operation more simple than if the visceral layer is approached across the pleural cavity. Minor wounds of the lung surface are common, but these can be closed with fine sutures, possibly with the addition of fibrin foam. There was no spread of infection in the cases operated upon in a series of seven patients. *T. Holmes Sellors.*

Tuberculous Empyema. ANDERSEN, D. A. (1949). *Brit. med. J.*, **2**, 6.

A series of 74 cases of tuberculous empyema is reviewed. . . . The presence or absence of tubercle bacilli in the fluid is not sufficient for diagnosis. Bacilli were not found in 19 cases, of which 12 were secondarily infected. In 54 cases the empyema was a complication of an artificial pneumothorax. In five of them an exudate had developed, which was not purulent but which rapidly returned after tapping, and the pleural cavity could not be obliterated by obtaining expansion of the lung. These were regarded as cases of incipient empyema, and were operated upon. Broncho-pleural fistula was demonstrated in 31 cases, of which 17 were secondarily infected. Altogether there were 38 secondarily infected cases.

Of 19 patients who had been unfit for operation 14 were dead, one was cured, and one improved; of 55 treated by plastic operation on the chest wall 51% were cured, 23% improved, and 22% dead. In some cases only four or five ribs were removed. In general, a satisfactory thoracoplasty led to a good permanent result, with no recurrence of tuberculous disease in the underlying lung. All the deaths, except one two years after operation, were in secondarily infected cases or in cases in which empyema was present for more than six months before operation. The results were best and the operations least extensive in cases treated early and in which secondary infection was absent. In cases of long-standing empyema it was often necessary to open the pleural cavity and remove the thick rigid walls. Ten operations of Schede and Roberts type were performed, with three deaths and two residual fistulae. Treatment by aspiration may result in obliteration of the empyema cavity, but should not be continued for more than two to three months. Thoracoplasty to control the disease in the re-expanded lung must usually follow. Empyema is not the only complication of pneumothorax treatment, although perhaps the worst. Pneumothorax in pulmonary tuberculosis should only be induced after careful thought, and the idea that it is a safe and simple procedure worthy of a trial as a first method of treatment in most cases is certainly incorrect. *L. M. Franklin.*

A Year's Experience of Plombage with Acrylic Resins. MEYER, L., DE ROUGEMONT, J., and LABEUR, A. (1949). *Rev. Tuberc., Paris*, **13**, 825.

The authors review their experience at Seyssuel with 20 patients in whom collapse of the apex of

a lung was produced by development of an extrapleural space and maintained by plombage with plastic balls. They followed the indications laid down by Wilson (*Surg. Clin. N. Amer.*, 1946, **26**, 1060), reserving the treatment for "poor-risk" cases rendered unfit for more drastic intervention by age, complicating disease, or extensive tuberculosis. The material used was methyl metacrylate in hollow balls, 2.54 cm. in diameter, sterile within, and kept in trioxymethylene for at least a week before use. They were rinsed in normal saline immediately before insertion, the number used in each case depending on the size of the space, but ranging from 10 to 50 and averaging 25 per patient. By using an extraperiosteal space the authors consider that they avoided the dangers of an extrapleural procedure, and in 12 cases no post-operative aspiration was required. A sero-sanguinous exudate developed in the other cases, which was readily removed by subclavicular aspiration. Two deaths occurred, one on the fourth day after operation, from anoxaemia, and the other on the 10th day, from heart failure. A single patient developed tuberculous infection of the space after four months, but responded well to the systemic administration of 60 g. of streptomycin. Another patient's wound broke down and a ball was extruded, but under penicillin and sulphonamide treatment the wound healed soundly. All other patients are well after a follow-up of two to fourteen months. *J. Robertson Sinton.*

A Modern Evaluation of Extrapleural Pneumonolysis in the Treatment of Pulmonary Tuberculosis, with Special Reference to Methyl Methacrylate "Plombage." Review of 26 Cases. WALKUP, H. E., and MURPHY, J. D. (1949). *Dis. Chest.*, **16**, 456.

The authors review 26 cases of pulmonary tuberculosis which they have treated by extrapleural pneumonolysis with "lucite" (methyl methacrylate) plombage. The patients concerned have not been followed up for long, but because the results have been so disappointing it was felt that there was no point in delaying publication. The authors discuss the indications for the operation and conclude that it is seldom called for. In four of the authors' cases pneumonolysis was found to be impracticable. In the remaining 22 cases the complications were frequent and various, and in over one-third the pack had to be removed on this account. The cavity closure rate achieved was only just over 50%. The authors condemn the operation of extrapleural pneumonolysis with plombage, whatever form of plombage is used, and consider that lucite "is far from being the optimum filling material." *J. R. Belcher.*

A Plastic Sponge Prosthesis for Use after Pneumonectomy: Preliminary Report of an Experimental Study. GRINDLAY, J. H., and CLAGETT, O. T. (1949). *Proc. Mayo Clin.*, **24**, 538.

This study is the sequel to the authors' earlier work on absorbable and non-absorbable plastic sponge-prostheses after pneumonectomy (*Proc. Mayo Clin.*, 1949, **24**, 346). In their earlier work the material of choice was at first "polythene," filled with fibreglass; as this had mechanical defects, "lucite" (methyl methacrylate) spheres were employed.

In the present study formalinized polyvinyl alcohol, made into a sponge, was the experimental material. In a series of eight dogs polyvinyl alcohol sponges were placed in the pleural cavity after one-sided pneumonectomy. The sponges could be shaped with scissors at the time of operation. In some animals a thin sheet of polythene film was sewn to the mediastinal surface of the sponge to prevent its becoming attached to mediastinal structures. The sponge was, in all cases, sewn to the parietal pleura. At the time of reporting, seven dogs were alive, one having been killed three months after the operation. Necropsy showed that the pleural cavity was covered on its mediastinal surface by a layer of avascular, collagenous fibrous tissue adherent to the thoracic wall. There was a minimal inflammatory reaction and it was noteworthy that the cavities of the sponge were lined by a single layer of vascular endothelium.

The authors suggest that clinical use of the material in selected cases might be warranted. *G. Blaine.*

Removal of Simple Univesicular Pulmonary Hydatid Cyst. BARRETT, N. R. (1949). *Lancet*, **2**, 234.

The author has devised a technique for removing pulmonary hydatid cysts intact, thus avoiding the dangers associated with rupture and leakage of hydatid fluid into the wound or pleural cavity. Under general (closed-circuit) anaesthesia, thoracotomy is performed and the pleura opened widely with rib-spreaders. A thin mackintosh bag, made like a sponge bag with the bottom cut open, is placed round the affected lobe and its strings are drawn moderately tightly round the hilum without interfering with the blood-supply or aeration of the lobe, the bottom of the bag being brought out through the incision and spread out over the surrounding skin. The lung is incised over the cyst, the adventitia of which is then partially incised for a distance approximately equal to its diameter. Extrusion of the cyst is

achieved by the anaesthetist (attempts by the surgeon to accelerate the process being deprecated), who increases the pressure in the anaesthetic circuit so that gradually, over a period of 10 to 30 minutes, the adventitia cracks to the full length of the incision and the hydatid finally falls out of the lung intact and lies in the mackintosh bag. The operating table is then tilted to allow the extruded cyst to roll out of the bag into a receptacle. *F. J. Sambrook Gower.*

Intrathoracic Dermoid Cysts and Teratoid Tumours. GRENADE, A. (1949). *Acta chir. belg.*, **48**, 307.

A series of 16 cases of intrathoracic teratoma and dermoid cyst treated by Crafoord during the last 10 years at Sabbatsberg is presented and compared with other series in the literature, which is fully reviewed. These patients accounted for 16.5% of all cases of mediastinal tumour operated upon and mostly presented between the ages of puberty and 30 years. Sex incidence in the whole series was equal, but almost all the malignant teratomata occurred in men. Various theories of the origin of this type of tumour are discussed without a final conclusion being reached, but it is thought likely that they originate either parthenogenetically from extragonadal germ cells, or from some irregularity in the formation of the 3rd branchial arch, the latter view accounting more satisfactorily for their almost invariable situation in the anterior mediastinum. Thus placed, and varying in size from that of a fist to that of an adult head, the tumour is intimately related, and usually intensely adherent, to the pericardium and great vessels posteriorly, the lungs laterally, and the back of the sternum anteriorly.

There is a prolonged latent period before increase in size gives rise to symptoms of vascular or pulmonary compression such as dyspnoea, pain, and cough; but infection of the cyst contents may cause acute illness with fever, or the cyst may rupture into the pleura or adjacent bronchus with dramatic consequences. The (rare) expectoration of cyst contents such as hair and sebaceous material, with haemoptysis, is the sole pathognomonic symptom. About 10 or 12% undergo malignant change, with acceleration of growth and intensification of symptoms—phrenic palsy, blood-stained pleural effusion, or positive Aschheim–Zondek reaction being highly suggestive. Diagnosis is chiefly radiographic—a fixed, rounded tumour in the anterior mediastinum, sometimes with patchy calcification or a tooth shadow, independent of the great vessels. Angiocardiography may establish the latter point and bronchoscopy show bronchial distortion. Exploratory puncture should never be attempted as rupture may follow.

The best treatment is always by excision, the chest being entered by a standard lateral thoracotomy on the side chiefly affected, the 5th or 6th rib being removed. Most of the surgical difficulties are due to the dense adhesions between the tumour and neighbouring structures, especially the vessels, and the complete absence of a plane of cleavage. Of the 16 patients 14 recovered completely, one (malignant) died later, and one (with bronchial fistula) required thoracoplasty. Detailed case-histories of all are given. *Geoffrey Flavell.*

Adenoma of the Bronchus: Endoscopic Treatment in Selected Cases. SOM, M. L. (1949). *J. thorac. Surg.*, **18**, 462.

The results of treatment are summarized in a series of 50 cases of adenoma of the bronchus, some of which have been reported previously and have now been followed up for a further 13 years. The author reviews the recent literature and is of the opinion that the similarity between cylindromata and true adenomata has given rise to confusion; his series consist of tumours in the latter group only.

In cases in which cure (proven by repeated biopsy examination) was achieved by endoscopic means the history was short (average 3.3 years), whereas when this treatment failed symptoms had existed for much longer (average 21.2 years). Tumours susceptible to endoscopic treatment are situated predominantly in the main bronchi and trachea. In those cases in which cure was achieved the average number of bronchoscopic treatments required was five. Of the present series 30% were cured by endoscopy with coagulation at the base of the tumour; the majority of the remainder had to be treated by resection. *J. R. Belcher.*

The Short Oesophagus. A Review of 31 Cases. RENNIE, J. B., LAND, F. T., and SCOTT PARK, S. D. (1949). *Brit. med. J.*, **2**, 1443.

This article, which starts with a brief historical review of the literature, describes the clinical features of the short oesophagus associated with hiatus hernia of the diaphragm, based on 31 cases admitted to the Western Infirmary, Glasgow, from 1937 to 1946. Dysphagia was complained of by 26 patients. During the same period, in 80 cases carcinoma was responsible for this symptom, and in 31 achalasia. Eighteen patients complained of burning pain, usually at the lower end of the sternum, radiating upwards and to the back; most commonly felt on swallowing, it was sometimes delayed and was mostly relieved by passage or

regurgitation of food. In nine cases there was haematemesis ; in four it was gross, but in only one case was there anaemia. Symptoms were characteristically intermittent.

For accurate radiological examination, a barium swallow must be given with the patient first standing and then tilted. In 26 patients a simple stricture was found, and in 15 an oesophageal ulcer. At oesophagoscopy, oesophagitis, sometimes with granulations or shallow ulcer, was seen for about 2.5 cm. proximal to the stricture, which might be due to fibrosis or spasm.

One patient had a carcinoma in a thoracic stomach. Seven patients had a history of gastric or duodenal ulceration. Three patients first developed dysphagia within a few days of a laparotomy. In five patients oesophageal symptoms began in the later months of pregnancy, and were not preceded by vomiting. It is suggested that the increased intra-abdominal pressure caused gastric reflux through an incomplete cardia.

There is little information on pathology available. In one of the patients, dying from another cause, at necropsy the oesophagus was not found to be short, but the hiatus was large (5 cm. wide). The initial lesion is thought to be a weakness of the hiatal ring, allowing herniation and reflux of gastric juice into the gullet. The resulting shortening may be due to spasm, or to cicatrization.

Most of these patients led a reasonably comfortable life if they were careful about diet and if bougies were occasionally passed.

M. Meredith Brown.

Tracheo-esophageal Constriction Produced by Right Aortic Arch and Left Ligamentum Arteriosum. NEUHAUSER, E. B. D. (1949). *Amer. J. Roentgenol.*, **62**, 493.

In five cases of dysphagia accompanied by severe stridor, symptoms were produced by a right aortic arch (the thoracic aorta descending along the right side of the spine) and a ligamentum arteriosum arising from the pulmonary artery and passing to the left of the trachea and oesophagus and thence behind the oesophagus to the thoracic aorta. A constrictive ring was thus formed.

On radiographic examination the aortic vascular mass was seen to the right of the midline. There was an indentation of the barium-filled oesophagus on the right side in the postero-anterior and left anterior oblique views, and a small filling defect was seen on the posterior aspect of the oesophagus ; the defect was produced by the ligamentum arteriosum as it passed behind the oesophagus from the left side. There was a shallow depression in the tracheal shadow on the right side. Division of the ligamentum arteriosum and the freeing of the vascular structures resulted in complete disappearance of both stridor and dysphagia.

A. Orley.

Decollation of Intrapleural Adhesions by Open Extrapleural Pneumonolysis. THOMPSON, B. C. (1949). *J. thorac. Surg.*, **18**, 496.

[The title of this paper is more formidable than its substance.] The advantages and performance of the operation of "open division of adhesions" are described, together with its recent technical modifications aimed at reducing the area of extrapleural stripping and minimizing the risk of bleeding and later development of obliterative pleurisy.

The operation is valuable when an otherwise satisfactory pneumothorax is prevented from being effective by fusion of lung to pleura over a limited area. When thoracoscopy has proved impracticable as a method of freeing the adherent zone and a choice has to be made between maintaining a contraselective pneumothorax and some alternative collapse measure, probably thoracoplasty, the possibility of utilizing this operation arises. Four cases are reported in which the operation was successfully employed, but the experiences of other workers suggest that complications have not always been eliminated by its use.

T. Holmes Sellors.

Biopsy of Diffuse Pulmonary Lesions. KLASSEN, K. P., ANLYAN, A. J., and CURTIS, G. M. (1949). *Arch. Surg., Chicago*, **59**, 694.

When confronted with diffuse, bilateral, pulmonary lesions that have defied diagnosis by the usual means, the authors perform direct pulmonary biopsy by a method which they describe and which, in their series of 50 cases, has resulted in no serious complication.

With the patient supine under positive-pressure cyclopropane–oxygen anaesthesia, an 8 cm. incision is made over the fourth interspace lateral to the sternum. The pleura is opened through an incision in the intercostal muscles. Upon application of positive pressure by the anaesthetist the lung at the junction of the upper, middle, and lower lobes presents through the wound. A selected wedge-shaped fragment of one lobe is removed between clamps and a careful airtight haemostatic repair effected with an ingeniously designed suture illustrated in the article. A penicillin solution is instilled in the pleural cavity and the wound closed, no pneumothorax resulting if positive pressure is exerted during pleural suture.

Details of six representative cases are given, with radiographs and photomicrographs of the biopsy

specimens; they include two cases of Boeck's sarcoid, one of fibrocaseous tuberculosis, and metastases from a thyroid carcinoma, an adenocarcinoma of the breast, and a melanoma. In this last case study of a section at necropsy revealed good repair with minimal scarring at the site of excision.

C. A. Jackson.

General

Correlation Between the Roentgenologic and Pathologic Findings in Chronic Pneumonitis of the Cholesterol Type. ROBBINS, L. L., and SNIFFEN, R. C. (1949). *Radiology*, **53**, 187.

In this condition the lung is involved in chronic interstitial inflammation in which the exudate is largely composed of mononuclear cells filled with cholesterol and cholesterol esters. This type of pneumonitis is common in the presence of bronchial obstruction and is often found in small localized areas in such chronic infections as bronchiectasis, pulmonary abscess, and tuberculosis. In the cases reported, however, no major bronchial obstruction or significant co-existent lung disease could be demonstrated roentgenologically or anatomically in the area of pneumonitis. The study is based on 11 such cases seen over a period of four years, all but one of the patients being males. In more than half the cases the onset of the illness was quite acute, with pain, cough, fever, and sputum. In the others the onset was insidious, with gradual development of cough, sputum, night sweats, and weight loss. In only three cases was there frank haemoptysis. There was no significant bacteriological finding.

The duration of symptoms from onset to the time of operation varied from one and a half to five years. Treatment was by resection, because the lesion often could not be differentiated from tumour and appeared to extend with time.

There are two radiological types. In five cases there was rather extensive involvement of a whole lobe associated with a moderate amount of collapse, the shadow tended to be homogeneous, and the bronchi did not appear to be particularly dilated. In six cases the area of increased density only involved a part of one or more segments of a lobe and the shadow was seen to lie against the pleura, either peripherally or along a fissure, the long dimension being parallel with the pleural surface. The margin away from the pleura was rounded or lobulated and sharply defined. Again, the bronchi either appeared normal or were only slightly dilated. In both types there was occasional evidence of pleural reaction (thickening or effusion), hilar and mediastinal lymph nodes were sometimes enlarged, and in rare instances small cavities were observed.

In the radiological differential diagnosis the most common alternatives to be considered are tumour, lung abscess, and infarct. In the first type differentiation from neoplasm may be impossible but in the second type, because the distribution is not completely segmental, neoplasm can frequently be excluded. In this type also, if iodized oil is introduced, several small bronchi may be seen to be obstructed, again suggesting the inflammatory nature of the process. In lung abscess, cavity formation is a much more prominent feature, and as a rule the cavities are considerably larger. The shadow caused by cholesterol pneumonitis may be identical with that of pulmonary infarction, but the subsequent behaviour of the lesion should help in differentiating the two.

L. G. Blair.

Roentgen Findings in Acute Friedländer's Pneumonia. FELSON, B., ROSENBERG, L. S., and HAMBURGER, M. (1949). *Radiology*, **53**, 559.

The authors have reviewed the radiographic findings in 16 cases of acute pneumonia due to Friedländer's bacillus. The disease is usually severe and fulminating in nature and, the organism being non-sensitive to penicillin, early diagnosis is desirable. Of the cases reviewed, 14 were fatal. The *x*-ray appearances were compared with those in a second group of 33 cases of miscellaneous types of pneumonia and in a further 25 cases of pneumococcal infection of severe type accompanied by bacteriaemia.

In contrast to the varying density of the shadow cast by consolidated areas in other types of pneumonia, the consolidation produced by Friedländer's bacillus gave, in every case, a shadow of a density equal to or greater than that of the heart shadow. Where the area of consolidation abutted upon a fissure the latter was bulged outwards into the unaffected lung; this was in conformity with the necropsy findings, which showed the affected part of the lung to be swollen. Free fluid in the pleural space or interlobar fissure was seldom found. This bulging, found in five out of eight cases, is considered to be a valuable radiographic sign; it was found in only two out of 25 cases of other types of pneumonia. Where the affected zone in Friedländer's pneumonia was not juxtapleural, the advancing edge of the consolidation was seen in 9 out of 14 cases to be well-defined and convex, giving rise on one occasion to a mistaken diagnosis of tumour. Abscesses appear to form frequently and to be mainly of the thin-walled type. No pure bronchopneumonic form of the

disease was encountered, complete consolidation having been established by the time of the first *x*-ray examination. It is concluded that the radiological findings in Friedländer's pneumonia are not pathognomonic, but will often suggest the diagnosis. *A. M. Rackow.*

Active Bronchopulmonary Lithiasis. FREEDMAN, E., and BILLINGS, J. H. (1949). *Radiology*, **53**, 203.

The authors accept as examples of active bronchopulmonary lithiasis those cases in which calcifications cause clinical symptoms. There are numerous ways in which broncholiths may form, but the overwhelming majority develop by perforation of calcific pulmonary foci or calcified lymph nodes into the bronchial tree. During perforation the bronchial wall is ulcerated, and haemorrhage is therefore extremely common. The broncholith may partially or completely obstruct a large or small bronchus with subsequent development of atelectasis, pneumonitis, bronchiectasis, or abscess. Pleural effusion, empyema, pneumothorax, or mediastinal emphysema may develop. The clinical manifestations may therefore be manifold; there is no single clinical syndrome. Primary bronchial carcinoma is probably the condition most commonly suspected as the cause of the symptoms, and bronchoscopy is undoubtedly the most reliable method of reaching a diagnosis.

The authors claim, however, that there are certain radiological features which should suggest the possibility of this condition. When shadows suggest carcinoma of the bronchus, atelectasis, lung abscess, or bronchiectasis, peripheral to calcific deposits or with areas of calcification in their central portions, the radiologist should think of the possibility of active bronchopulmonary lithiasis, and suggest this diagnosis to the clinician. In triangular areas of atelectasis, the calcification is frequently situated at the apex of the triangle. Tomography is an important diagnostic procedure, for it may reveal the stone lying in the lumen of the bronchus or demonstrate calcifications in close relation to the bronchial wall, with secondary inflammatory changes peripheral to the point of obstruction. Bronchography is of decidedly less value than tomography. This report is based on the study of seven cases seen during the past year. *L. G. Blair.*

Peptic Ulcer of the Oesophagus. [In English.] THOMSEN, G. (1949). *Acta radiol., Stockh.*, **32**, 193.

The diagnosis of peptic ulcer of the oesophagus has been made in 27 cases in the radiological department of the University Hospital, Copenhagen, since 1936, while in two further cases an ulcer was demonstrated which was at first thought to be benign, but later proved to be carcinomatous. [The frequency of the diagnosis cannot be assessed as no figures are given for comparison.] There were 15 male and 12 female patients in the series. The oesophagus was short in all 11 patients under the age of 10 and in 7 out of 11 patients over the age of 40.

In the 11 patients under the age of 10, the symptoms dated from birth or soon after and vomiting, usually of undigested food, was a prominent feature. Haematemesis, ranging from streaks of blood to amounts large enough to endanger life, was also universal. "A few" of these children complained of pain on swallowing, "some" had more pain lying down and felt better on sitting up, while one had formed the habit of sleeping in a sitting posture. Two were treated surgically, with one death, and nine were treated with diet, oesophageal dilatation, duodenal intubation, etc. Results were poor and all 11 patients had to be admitted to hospital repeatedly. Of the nine patients without a short oesophagus, four had an ulcer in the region of the pylorus; one had had hydrostatic dilatation of the cardia 15 years previously for cardiospasm (it is suggested that this had made the cardia incompetent); and in the remaining four cases a tentative suggestion of ectopic gastric mucosa is made although no evidence of this was obtained. The results of treatment in this group were comparatively good. The results of treatment of the seven patients over 40 with a short oesophagus are not given in detail but were apparently poor. Four patients underwent operation and there was one death.

Pulmonary Adenomatosis. BUBIS, S., and ERWIN, J. H. (1949). *Amer. J. Med.*, **7**, 336.

Pulmonary or infectious adenomatosis is a rare condition, only 19 cases having been previously recorded. The authors now report two cases of their own in which the disease was discovered at necropsy. The aetiology is obscure. A similar disease occurs in sheep, horses, rabbits, guinea-pigs, and mice. Clinically it manifests itself as a recurrent pulmonary infection, often starting after an acute illness, lasting for some months or years, and causing death from asphyxia. Both lungs are involved, and scattered throughout them are areas in which the alveolar epithelium is changed into a tall columnar form producing mucus and resembling glandular tissue. Chronic anoxia is probably the most important factor in producing metaplasia and proliferation of the epithelium.

Histologically the disease seems to be benign, but some cases with metastases have been described. Important signs are loss of weight, weakness, cough with copious mucoid sputum which does not contain significant organisms, severe dyspnoea, cyanosis, and leucocytosis. Clubbing of the fingers is uncommon and cor pulmonale has not been recorded. The authors' cases were both in males, aged 66 and 63, with a history lasting three months and five years respectively. Radiographic examination of the chest in one case suggested a fungus infection. Both patients had a leucocytosis, with counts of 18,000 and 20,000 per c.mm. and 90% polymorphs, and both died shortly after admission to hospital. At necropsy the lungs were found to be bulkier and heavier than usual and had thickened pleura; scattered throughout them were areas of consolidation resembling carcinoma, but without any evidence of malignant disease in the bronchi or lymph nodes. On histological examination the alveoli in these areas were found to be filled with fibrinopurulent exudate containing phagocytes. The cells lining the alveoli were proliferating and showed metaplasia, being tall and columnar with signs of globular secretion. There were also an increase in the fibrous tissue and evidence of secondary infection, but no sign of tuberculosis or malignant disease. The authors examined sections from 76 cases of other types of pulmonary disease, such as lobar pneumonia, pulmonary infarction, lung abscess, and pulmonary tuberculosis. They found a variable amount of epithelial hypertrophy and hyperplasia, but in no instance were there tall columnar alveolar cells producing mucus. *Arthur Willcox.*

Pulmonary Arteriovenous Fistula (Varix). Review of the Literature and Report of Two Cases. YATER, W. M., FINNEGAN, J., and GIFFIN, H. M. (1949). *J. Amer. med. Ass.*, **141**, 581.

A total of 41 cases of congenital pulmonary arteriovenous fistula reported in the literature is reviewed; to these two personal cases and two others are added. In 36 the diagnosis was established clinically, in eight at necropsy, and in one at operation. Related to familial haemorrhagic telangiectasia, the lesions may be single or multiple (more than half were multiple), and consist of a distended thin-walled afferent artery, distended efferent veins, and an intervening loculated vascular sac.

Mostly recognized in early adult life, they are associated with cyanosis, clubbing, an extracardiac bruit louder on inspiration, dyspnoea, polycythaemia, raised haemoglobin value and blood volume, and lowered arterial oxygen saturation (further lowered by exercise); they present the characteristic radiological appearance of a lobulated opacity which may appear connected with the hilum, may be seen to pulsate, and is revealed by angiocardiography. Physiological changes naturally vary with the size of the shunt.

Treatment consists in removal of the affected lobe or lung, and this was carried out in 24 of the 45 cases, with two deaths and 22 cures. The condition of one patient was improved by local excision; that of another was unchanged by ligation of the tributary vessels. Complications are pulmonary haemorrhage due to rupture of the varix (three deaths), and cerebral thrombosis due to polycythaemia. In 20 cases there was some evidence of the latter having occurred. *Geoffrey Flavell.*

Bronchiectasis: A Study of the Segmental Distribution of the Pathologic Lesions. MOORE, J. R., KOBERNICK, S. D., and WIGLESWORTH, F. W. (1949). *Surg. Gynec. Obstet.*, **89**, 145.

The authors reviewed the cases of seven children between the ages of 2 and 11 years in whom lobectomy or pneumonectomy had been performed for bronchiectasis and compared the histopathology of all the excised segments with the bronchographic and macroscopic appearances, their object being to test the validity of the assumption that bronchiectasis is segmental in incidence, and that areas of a lobe which appear normal in bronchograms and at operation may safely be left and a strictly segmental resection performed. Detailed microscopy revealed definite inflammatory lesions in the apparently normal segments removed; epithelial ulceration and destruction of the bronchial muscle and elastica were not marked even in those portions known to be diseased; and in several instances the disease appeared to be more marked in bronchographically normal areas than in those in which dilatation had been demonstrated radiologically.

Geoffrey Flavell.

Bronchoscopic Findings in Pulmonary Haemorrhage. ELOVA, M. Y. (1949). *Terap. Arkh.*, **21**, No. 6, 41.

The author has performed bronchoscopy 4,000 times in 450 cases (of which 246 were associated with haemoptysis). He maintains that haemoptysis is an indication for bronchoscopy at the earliest possible date. In 147 cases (out of 246) the cause of haemoptysis was found to be in the bronchial system. There were 54 cases of chronic pulmonary suppuration, where granulation tissue in the bronchi was responsible for blood-staining of sputum, 47 cases of ulcerative bronchitis, 36 of

bronchial carcinoma, 7 of diffuse haemorrhagic bronchitis and bronchiectasis, and 3 of bronchial polypi. No cause for haemoptysis could be seen in 99 cases, though the area in which the haemorrhage originated was established.

In 60% of the above cases it was possible to reach a diagnosis and start the necessary treatment; the 47 cases of ulcerative bronchitis and bronchiectasis were treated by washout of the bronchial tree with 0.5% phenazone (10 to 15 ml. three to four times during each bronchoscopy session) and cauterization of the ulcers with 3 to 5% silver nitrate. After three or four bronchoscopies at four- to five-day intervals, haemoptysis ceased in 40 cases, and in 7 cases the condition improved considerably. In chronic pulmonary suppuration the bronchial tree was first cleared with saline; the granulations were then cauterized with 10% silver nitrate or 1% "protargol" and 100,000 to 200,000 units of penicillin introduced intrabronchially. Haemoptysis ceased in 43 cases, 6 cases relapsed after five months, and in 5 cases there was no improvement. Seven cases of haemorrhagic bronchitis were treated in a similar way; in 5 haemoptysis stopped, and in 2 cases there was some improvement. After excision of bronchial polypi haemoptysis stopped in 2 cases; in 1 case there was a relapse within a short time because new polypi grew. In 99 cases in which the haemoptysis originated in the lung parenchyma, satisfactory results were achieved by introducing 100,000 to 200,000 units of penicillin intrabronchially during each bronchoscopy session. In no case did frequent bronchoscopies lead to a detectable deterioration of disease.

N. Chatelain.

Acute Primary Pulmonary Blastomycosis. BONOFF, C. P. (1950). *Radiology*, **54**, 157.

The author reviews the literature of blastomycosis, and states that only one of the cases reported can be regarded as of acute primary pulmonary blastomycosis. Primary pulmonary lesions due to other fungi have been described since 1935. During the months of November and December, 1946, 23 cases of acute primary pulmonary blastomycosis occurred in U.S. Army personnel stationed on Okinawa. Only 6 of these cases, in which there were positive *x*-ray findings, are described. [It is not clear whether the other 17 were *x*-rayed or not.]

The acute form of pulmonary blastomycosis is characterized by localized chest pain, a productive cough with grey sputum, a temperature in the region of 101 to 102° F. (38.3 to 38.9° C.), and absence of superficial lymphadenopathy and of any type of cutaneous lesion. The leucocyte count is in the range of 11,000 to 12,000 per c.mm., with a normal differential count, and there is a moderate elevation of the erythrocyte sedimentation rate. In addition, the organism may be isolated from the sputum, urine, and possibly the faeces. The radiological appearances are entirely non-specific. Three cases showed small, hazy, patchy areas; one presented round foci; one showed progressive consolidation, and one was manifest only by pleural effusion. In all cases, at one time or another in the course of the disease, there was evidence of moderate enlargement of the hilar or mediastinal lymph nodes. The *x*-ray appearances, therefore, are merely suggestive of a granulomatous type of disease. The acute form appears to be benign as a rule, but may become disseminated and lead to death in a short period of time.

L. G. Blair.

Cystic Pulmonary Fibrosis in Generalized Scleroderma. Report of Two Cases. CHURCH, R. E., and ELLIS, A. R. P. (1950). *Lancet*, **1**, 392.

After a review of the published work on scleroderma with fibrosis of the lung the authors describe 2 cases of scleroderma and cystic pulmonary fibrosis. Generalized scleroderma is a disease of connective tissue as a whole and, although skin lesions often appear first, affections of the heart, oesophagus, alimentary tract, kidneys, pituitary, thyroid, adrenals, eyes, larynx, and lungs have all been described.

Cystic changes in the lungs are unusual, but it is believed that they can be produced when the much commoner pulmonary fibrosis leads to bronchiolar obstruction, which in turn causes obstructive emphysema and ultimately cyst formation. Once begun, fibrotic contraction of the surrounding tissue accelerates the process. In one case iodized oil introduced into the bronchial tree did not enter the cysts, and this suggests advanced stenosis of the communicating bronchioles.

The lung changes in scleroderma may have to be distinguished from those of bronchiectasis, tuberculosis, "congenital cystic lungs," and atypical and unresolved pneumonia. Less commonly, disseminated lupus erythematosus, rheumatoid arthritis, polyarteritis nodosa, and dermatomyositis—broadly grouped as collagen vascular diseases—may all be associated with pulmonary fibrosis. Scleroderma should be considered in the differential diagnosis of obscure fibrotic lung conditions, since the lung lesion may occur without obvious skin changes.

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