Thorax (1950), **5**, 200.

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.*

Experimental

Antibiotics and Chemotherapy

Para-amino-salicylic Acid (PAS) in the Treatment of Pulmonary Tuberculosis with Secondary Intestinal Tuberculosis. CARSTENSEN, B., and SJÖLIN, S. (1949). *Poumon*, **5**, 209.

The authors, working in two Swedish sanatoria, have treated in the past three years 22 cases in young adults in which pulmonary tuberculosis was complicated by intestinal tuberculosis.

In 20 cases there was an active, cavitating pulmonary lesion; in the other two cases the lung lesions were inactive. All patients had abdominal and general symptoms, not altogether accounted for by the lung lesion. Intestinal involvement was confirmed radiologically in 21 cases and at necropsy in the remaining case. The prognosis was in all cases considered to be poor. Before *p*-amino-salicylic acid therapy patients had been under observation in sanatoria for 5 to 27 months without response to treatment. From the beginning of this therapy cases were observed for 2 to 12 months, 15 of them for more than six months.

The drug was given for several months in periods of three to six weeks with a week between the periods. The dose was 14 g. initially followed by 10 g. (or rarely 5 g.) daily in five equal doses. No severe toxic effects were seen.

In every case there was marked improvement in the general condition, maintained in all but three cases. Of eight cases with recent exudative lung lesions all showed definite improvement radiologically. Relief of intestinal symptoms was most striking; this was usually complete within four weeks of starting treatment. Barium enema examination of 11 cases showed radiological improvement in five cases after three to nine months' treatment; in two of these cure appeared to be complete. Four patients became well enough to go home; seven became fit enough for thoracoplasty, and in two a pneumothorax was induced. Of three patients with advanced pulmonary disease, the condition in two became worse and one died, though all experienced relief from intestinal symptoms. In seven cases in which treatment has been stopped for one to four months there has been no recurrence of abdominal symptoms.

J. M. Alexander.

The Pharmacologic and Chemotherapeutic Action of Some New Sulfones and Streptomycin in Experimental Tuberculosis. SMITH, M. I., JACKSON, E. L., JUNGE, J. M., and BHATTACHARYA, B. K. (1949). *Amer. Rev. Tuberc.*, **60**, 62.

The sulphones studied were 4:4′-diaminodiphenylsulphone (DDS); two of its di-substituted derivatives, "promin" and "sulphetrone"; and a mono-substituted derivative, 4-amino-4′-β-hydroxyethylaminodiphenylsulphone ("hydroxyethyl"). Blood and urine analyses in animal experiments suggest that promin and sulphetrone given orally are metabolized to the parent DDS but that hydroxyethyl is not. Intravenous acute toxicities of promin and sulphetrone in rats were equal in terms of DDS equivalent. Oral acute toxicity of sulphetrone and hydroxyethyl in rats was less than that of promin and still less than that of DDS, and these animals tolerated 3 to 5% sulphetrone, 0.8% promin, and 0.2% DDS in the diet in a chronic test; the low toxicity of sulphetrone may be due to poor absorbability. In terms of DDS equivalent, promin by mouth is about as toxic as DDS in rats, guinea-pigs, and cats, while sulphetrone and hydroxyethyl are much less toxic. Hydroxyethyl protected mice against experimental pneumococcal infection, and the chemotherapeutic index was more favourable than that of DDS. In experimental tuberculosis in guinea-pigs the activity of hydroxyethyl compared favourably with that previously reported for promin, and similarly potentiated the action of streptomycin. Sulphetrone was less effective than hydroxyethyl when used alone and potentiation of streptomycin by it was less marked.

P. D'Arcy Hart.

Relative Effectiveness of Parenteral, Intrathecal, and Aerosol Penicillin in Chronic Suppurative Disease of the Lung. GAENSLER, E. A., BEAKEY, J. F., and SEGAL, M. S. (1949). *J. thorac. Surg.*, **18**, 546.

At the Boston City Hospital the authors investigated the relative effectiveness of parenteral, intratracheal, and aerosol administration of penicillin in chronic suppurative conditions of the lungs. After a brief review of the relative literature, including three papers of their own (to be published), they describe the effects of giving a single dose of 100,000 units of penicillin in these three ways to each of four patients, two of whom were suffering from purulent lung abscess and two from bronchiectasis.

The most important finding was the absence of penicillin from the sputum after intramuscular injection of the test dose, a finding which is consistent with the general failure of parenteral penicillin therapy in chronic purulent disorders of the lung. The levels in blood and amounts excreted in urine after endotracheal and aerosol administration were essentially the same as those in similar experiments with normal subjects; this suggests that absorption occurs in the normal parts of the diseased lung, and the authors point out that this fact is responsible for wastage with the aerosol method. Amounts varying from 14 to 83% of the dose were recovered from the sputum after intratracheal administration, and 5 to 25% from the sputum after aerosol administration. Clinically, both intratracheal and aerosol administration were found to be effective; the authors prefer the latter, except where intubation is indicated for other reasons. For intratracheal instillation of penicillin local analgesia is usually required, with suppression of the cough reflex as well as possible irritation of the vocal cords if the procedure is repeated.

The authors consider that the most effective way to maintain high penicillin levels in the sputum is to repeat the aerosol inhalation about every four hours. It seems clear from this careful study and from other relevant work, that the thick avascular walls of lung abscesses or bronchiectatic cavities constitute an impassable barrier to penicillin in either direction. *Maxwell Telling.*

The Efficacy of BCG Vaccination. HYGE, T. V. (1949). *Acta tuberc. scand.*, **23**, 153.

More than five years after the outbreak of an epidemic of tuberculosis in a Danish state school for young girls in 1943 (see *Acta tuberc. scand.*, 1947, **21**, 1) the author reviews its course. Since the original report, two new cases of progressive pulmonary tuberculosis have occurred in the group of originally tuberculin-negative pupils, each of which developed four years after the primary infection. There were no further cases among the B.C.G.-vaccinated or the originally tuberculin-positive pupils.

Thus the results at the end of five years are as follows: of 94 tuberculin-negative, unvaccinated pupils exposed to infection 70 became tuberculin-positive, in 40 of whom pulmonary tuberculosis was demonstrated radiologically (36) and/or by gastric lavage (37); 11 of these patients developed progressive pulmonary tuberculosis (seven with cavitation) and one died. In 106 B.C.G.-vaccinated pupils exposed to infection only two cases of pulmonary tuberculosis appeared, both with cavitation. In 105 originally tuberculin-positive pupils exposed to infection four cases of pulmonary tuberculosis appeared; only two of these, however, could be regarded as due to exogenous re-infection. *J. M. Alexander.*

The Value of BCG-Tuberculin in Testing the Calmette-vaccinated. [In English.] BLUHM, I. (1949). *Acta tuberc. scand.*, Suppl., **21**, 24.

Mantoux tests were carried out on B.C.G.-vaccinated subjects with (*a*) old tuberculin and (*b*) tuberculin prepared from B.C.G. cultures. Of 43 subjects examined six to eight weeks after vaccination 37 were found to be positive reactors to 1 mg. of B.C.G.-tuberculin, compared with 29 who were positive to the same dose of old tuberculin. The six cases in which a negative reaction to B.C.G.-tuberculin was found were also negative to old tuberculin. Of 197 subjects of all ages up to 35 re-examined from six months to five years after vaccination a total of 181 reacted positively to B.C.G.-tuberculin, compared with 150 positive reactors to old tuberculin. In cases in which there was a positive reaction to both vaccines the reactions were usually more intense with B.C.G.-tuberculin. A control group of 54 non-vaccinated children and adults, who were Mantoux-negative to old tuberculin, also reacted negatively to B.C.G.-tuberculin. *G. B. Forbes.*

Respiratory Function

Studies of the Pulmonary Circulation. I. The Circulation Time from the Pulmonary Artery to the Femoral Artery and the Quantity of Blood in the Lungs in Normal Individuals. EBERT, R. V., BORDEN, C. W., WELLS, H. S., and WILSON, R. H. (1949). *J. clin. Invest.*, **28**, Part II, 1134.

The quantity of blood in the pulmonary vessels, left heart and aorta (Q) was calculated from the formula

$$Q = \frac{\text{cardiac output (ml./min.)} \times \text{mean circulation time (sec.)}}{60}$$

The cardiac output was measured by the direct Fick method. The mean circulation time from the pulmonary artery to the femoral artery was investigated in the following way. The dye T-1824 was injected directly into the pulmonary artery through an intracardiac catheter. Consecutive samples of blood from the femoral artery were withdrawn and the point when the dye concentration in the femoral blood reached zero was noted; the mean circulation time was then obtained from the graph in which dye concentrations were plotted against the times of collection of the samples from the femoral artery. The average circulation time in 12 normal human volunteers was 10.2 seconds with a standard deviation of ± 1.6. The cardiac output was found to be 6.92 ± 1.5 and cardiac index 3.59 ± 0.72 litres per minute. The mean value for Q was 1,160 ± 246 ml. Correcting the individual values for Q to 1.73 sq. m. of body-surface gave a mean value for the group of 1,045 ± 200 ml., which constitutes 19.5% of the total blood volume. It is, of course, understood that the true pulmonary blood volume is less than the value for Q. For its calculation the mean circulation time from the pulmonary artery to the left auricle is necessary. The authors also point out that by their method the value for Q is lower (1.16 litres) than that obtained (2 litres) with previous procedures in which the dye is normally injected into a precubital vein.

A. I. Suchett-Kaye.

Studies of the Pulmonary Circulation. II. The Circulation Time from the Pulmonary Artery to the Femoral Artery and the Quantity of Blood in the Lungs in Patients with Left Ventricular Failure. BORDEN, C. W., EBERT, R. V., WILSON, R. H., and WELLS, H. S. (1949). *J. clin. Invest.*, **28**, Part II, 1138.

Having found the mean value for Q (volume of blood in the pulmonary vessels, left heart, aorta, and iliac arteries, together with all the blood contained within the other branches of the aorta to points where the dye arrives no later than it does at the femoral artery) in healthy subjects, the authors determined its value in patients with cardiac disease. There were 10 cases of mitral stenosis associated with pulmonary hypertension and dyspnoea on exertion, and 18 cases of aortic valvular disease or hypertension with dyspnoea on exertion and occasional attacks of paroxysmal dyspnoea. The technique of measurement was the same as that described in the Abstract above, and calculation was made according to the formula of Stewart.

The following results were obtained: (1) The mean circulation time from the pulmonary artery to the femoral artery was prolonged in patients with mitral stenosis and in those with left ventricular failure, the increase being greater in the latter group. (2) The mean cardiac index was significantly reduced in all patients. (3) The mean value for Q in the patients with mitral stenosis was 1,230 ml. (normal 1,160 ml.), a difference not significant statistically; hence, there was no evidence of a large increase in circulating blood in the lungs. (4) The mean value for Q in the patients with left ventricular heart failure was 1,750 ml., a figure significantly greater than in normal people. This increase has been accounted for by the increase of blood volume in the dilated left ventricle; it was impossible, therefore, to evaluate changes in pulmonary blood volume in this group. (5) There was no correlation between the reduction in vital capacity and Q. This suggested that reduction in vital capacity in cardiac patients was not a direct function of increase in circulating blood in the lungs.

A. I. Suchett-Kaye.

I. Motility of the Human Esophagus in Control Subjects and in Patients with Esophageal Disorders. II. Cardiospasm, a Generalized Disorder of Esophageal Motility. KRAMER, P., and INGELFINGER, F. J. (1949). *Amer. J. Med.*, **7**, 168, 174.

A radiologist examining the barium-filled oesophagus on the screen can distinguish four types of muscular activity. Basal tone is roughly measured by the diameter of the oesophagus. Generalized changes in tone are shown by variations in diameter. Propulsive peristaltic waves are usually marked after thick barium paste has been swallowed or when an organic obstruction is present. The presence of irregular non-propulsive contractile rings is common in cardiospasm and these rings are sometimes seen even in the absence of delay.

In the present study an attempt was made to record these activities kymographically by means of a 5 cm. long condom attached to a Miller–Abbott tube. Separate records were made for the upper, middle, and lower oesophagus. Basal tone was measured by the amount of air forced into the condom by a constant pressure of 20 to 25 cm. of water. The vigour of the contractions was measured by the amount of air expelled at the height of each wave. The frequency and regularity of the waves was recorded on a smoked drum.

A comparison was made between 15 normal controls and four patients with cardiospasm, four with scleroderma, and two with organic strictures at the lower end of the oesophagus. Basal tone was reduced in the group of abnormal cases and the reduction was greatest with cardiospasm and least with an organic stricture. Motility was fairly

normal in the two cases of stricture. (If anything, the frequency of contraction waves was reduced and their vigour increased.) In scleroderma no contraction waves were noted, and in cardiospasm the contraction waves were irregular and usually feeble.

A further distinction was noted after giving 6 to 10 mg. of acetyl-β-methylcholine intramuscularly. The effect of this drug in patients with cardiospasm was startling. Within two minutes all the air was forced out of the condom by a tonic contraction which obliterated the lumen. Even a considerably dilated oesophagus contracted so that only a thin thread of barium was visible. In the normal oesophagus increase in tone was far less marked and in scleroderma little or no effect could be detected. One patient who had at first been thought to be suffering from cardiospasm gave a response resembling that in scleroderma, and the fact that Raynaud's phenomena and skin changes subsequently developed justified the change of diagnosis.

It is argued that the generalized dysfunction of oesophageal motility in cardiospasm is consistent with a disruption of the parasympathetic innervation, and that, since the oesophagus is hypersensitive to acetyl-β-methylcholine, it may well be equally sensitive to humoral agents produced by emotion. The demonstration that the symptoms of cardiospasm are accentuated by emotion is therefore no evidence that the disorder is primarily psychogenic.

[This argument is borne out by the fact that Heller's operation sometimes leads to considerable anatomical improvement but that the patient may still suffer from severe symptoms during periods of emotional tension.] *Denys Jennings.*

Tuberculosis: Clinical

Tuberculous Infection from Dogs. URWITZ, S. (1949). *Acta tuberc. scand.*, **23**, 211.

The author describes the occurrence, in Spring, 1948, of a small epidemic of tuberculosis among families of men of the Swedish Royal First Lifeguard, stationed in Stockholm, which seems to give support to the idea that tuberculosis may be transferred from human beings to dogs and vice versa.

Conditions of regimental life within a relatively isolated community made it comparatively easy to trace the contacts of the five infected persons, but although the whole regimental staff of about 2,000 persons was examined by *x*-ray screening, no case of infectious tuberculosis was found. In August, 1947, however, an apparently healthy dog had been given to the regiment and entrusted to the care of one of the senior quartermaster-sergeants. It slept in a kennel, but spent most of the time with the quartermaster's family, playing with the children. It was later discovered that in July, 1947, the dog had been in frequent contact with a man whose sputum had been consistently positive for tubercle bacilli for the previous year. In March, 1948, the dog became unwell and began to lose weight, and by April he was obviously ill and was destroyed at the Stockholm Veterinary College. Post-mortem examination showed tuberculous infection of the hilar lymph nodes with a human type of bacillus. The condition of the glands was consistent with contraction of the infection in July, 1947. During May and June, 1948, active pulmonary tuberculosis was discovered in two children of the family (A) of the dog's master, in the mother and only child of the family (K) who shared a two-storey cottage with family A, and in a playfellow of the children A. Three of the children had been shown by tuberculin-testing and/or *x*-ray screening to be free of tuberculous infection within the previous six months. All their schoolfellows and the teaching staff of their school had been screened a month before the children fell ill, and were tuberculin-tested three to four months after discovery of the infection: no other cases were discovered.

The author mentions that post-mortem examinations on dogs at the Veterinary College during the past 10 years showed that 52 out of 3,673 had suffered from tuberculosis. He concludes that in view of the failure to trace the source of infection in a considerable proportion of cases of childhood tuberculosis, the possibility that the infection may be transmitted by dogs should be considered very seriously. *J. M. Alexander.*

Evaluation of Planigrams in Pulmonary Tuberculosis. MORGENSTERN, P., CARR, C. E., and NALLS, W. L. (1949). *Amer. J. Roentgenol.*, **62**, 402.

In 300 consecutive sets of planigrams (tomograms) of the chest from tuberculous patients the findings were correlated with the clinical course of the disease and, in 23 cases, with the appearances in lobectomy or pneumonectomy specimens.

The authors conclude that rigid criteria must be applied to the diagnosis of cavitation: (1) The oval or annular density surrounding the transradiant area must be completely and sharply defined. (2) The walls of the suspected cavity must be distinguishable from linear shadows of vessels, pleura, or ribs in the vicinity. (3) Where collapse has been carried out the site of the suspected cavity must relate to that of the original cavity. (4) The presence of an identifiable bronchus leading into, or just short of, the translucency in a dense lung after thoracoplasty is helpful.

Planigraphy is of limited value in study of small multiple caseating foci represented by soft confluent nodular opacities. Emphysematous bullae and bronchiectatic dilatations may be difficult to differentiate from true cavities. In no case was cavitation found in an area of lung in which infiltration could not be detected in the plain radiograph.

A series of 15 cases representing various types of lesion seen are illustrated and described, together with the lobectomy findings or deductions based upon the subsequent course. *A. M. Rackow.*

Neoplasm

The Pathology of Subacute Cor Pulmonale in Diffuse Carcinomatosis of the Lungs. MORGAN, A. D. (1949). *J. Path. Bact.*, **61**, 75.

A man aged 68 years died with what appeared to be congestive heart failure due to chronic bronchitis and emphysema. Necropsy, however, revealed a "leather bottle" type of gastric carcinoma. The heart was a typical cor pulmonale, but the lungs, which were bound to the chest wall by old adhesions, showed only mild emphysema and in contrast to the usual features of this condition were rather tough and did not crepitate. The larger branches of the pulmonary artery bore atheromatous plaques. The thoracic duct and hilar lymph nodes were apparently normal.

Histologically the stomach contained an atrophic scirrhous carcinoma. The lungs showed an obliterative endarteritis of most of the arterioles and carcinomatous plugs in the peribronchial and perivascular lymphatics, while in some of the smaller arteries, which were reduced to fibrous cords, carcinoma cells were intravascular as well as perivascular. Disappearance of the media in some cases indicated the long-standing nature of the lesions. The peripheral and subpleural regions of the lungs showed the most marked changes.

The literature relating to lymphangitis carcinomatosa and subacute cor pulmonale is reviewed; it appears that the former is most frequently (in 75% of cases) due to undiagnosed gastric carcinoma, and that the development of subacute cor pulmonale is not the result of lymphatic blockage itself but is due to occlusion of the pulmonary arterioles by malignant embolism and subsequent arteriolar thrombosis and organization. It is suggested, at least in the case described, that lymphangitis carcinomatosa is more probably due to haematogenous deposition of malignant emboli in the peripheral parts of the lungs followed by centripetal lymphatic extension, than to retrograde spread to the hilum with subsequent centrifugal lymphatic spread. The group of cases in which the latter mode of spread exists is usually unassociated with right ventricular hypertrophy, but a study of the literature suggests that there is no clear-cut histological distinction between the two types. *R. B. T. Baldwin.*

The Increase in Deaths Attributed to Cancer of the Lung. HEADY, J. A., and KENNAWAY, E. L. (1949). *Brit. J. Cancer*, **3**, 311.

The question whether the recent increase in deaths attributed to carcinoma of the lung is due to a real increase in the incidence of the disease has been discussed by many writers. This paper gives no new information but examines some of the published evidence. It is concluded that the best index from hospital data is the ratio of necropsies at which carcinoma of the lung is found to total necropsies performed. The necropsies at which carcinoma of the lung is found are more likely to be a true measure of its incidence than admissions for, or deaths attributed to, this disease, since both these latter include mistaken diagnoses. Using the above-mentioned ratio Passey and Holmes found no change between 1894–8 and 1914–18, but a slightly increased proportion in 1919–23 and again in 1924–8. There is a parallelism in the movements over time of these figures and the Registrar-General's figures for deaths. The data set out by Passey and Holmes extend, however, only to the period 1924–8, and some workers who accept them to-day as evidence that no real increase in carcinoma of the lung has occurred seem to overlook the fact that the rise in the number of deaths attributed to this cause was relatively small up to that time but since then has been enormous—for example, the number of deaths of males in England and Wales was 814 in 1928 and 7,667 in 1947. The investigation of these authors ended, therefore, just as the rapid increase of the last 20 years was beginning. Other figures, published by Bonser from Leeds, show no clear evidence of an increase in intrathoracic carcinoma between 1891–2 and 1923–7, but a slight increase in 1928–32 and a substantial one in 1933–7. Clemmesen and Busk base their conclusion on the number of cases of carcinoma of the lung detected at the Central Tuberculosis Station, Copenhagen, and maintain that there has been no real increase in Denmark. The numbers involved in this approach are so small and drawn from so highly selected a population that this generalization does not commend itself to the present authors. While not committing themselves to a conclusion, they clearly do not accept

the hospital evidence in this country as supporting the view that the rise in the number of deaths from carcinoma of the lung is merely a result of more accurate diagnosis.

Asthma

Use and Abuse of Bronchoscopy in Allergic Asthma. WALDBLOTT, G. L. (1949). *J. thorac. Surg.*, **18**, 526.

The use of any form of intrabronchial instrument during an asthmatic attack is liable to lead to exacerbation and it is recorded that a spasm can be sufficiently severe to break off the bougie. On the other hand, there is considerable value in bronchoscopy in the severe stages of an asthmatic attack if there is much sticky mucus which may act as an actual foreign body and easily produce atelectasis. The use of bronchoscopy in some cases of chronic or very severe asthma should be greatly increased. On the other hand, if the attacks are not of long duration, and if there is no secretion, bronchoscopy may actually be detrimental. Intolerance of the patient to certain drugs, notably local analgesics and morphine derivatives, may produce alarming symptoms in some allergic states and it is suggested that anaesthesia should be reduced to a minimum if bronchoscopy is considered in these cases. Thiopentone is valuable in arresting an attack in progress, but is not always a safe agent to use in initial anaesthesia. *T. Holmes Sellors.*

Thoracic Surgery

Lung Resection. MAURER, A., SAUVAGE, R., and MERLIER, *M.* (1949). *J. Chir., Paris*, **65**, 705.

With the usual Gallic flair for surgical anatomy, the authors describe in detail the various types of lung resection: pneumonectomy, upper lobectomy, lower lobectomy, isolated middle lobectomy, and bilobectomy. In all these operations the hilum should be exposed and mobilized as early as possible. No main vessels or bronchi must be severed until it is certain that removal of the portion of lung concerned is feasible. In the case of individual lobes the hilum is best approached through a fissure. Where adhesions are considerable this may be impossible, and an extrapleural dissection may be necessary. All main vessels must be carefully traced to their destination before division; their anatomy is subject to considerable variation, and a major hilar artery going to the wrong lobe may easily be divided if this precaution is not observed. Division of the bronchi is the most difficult part of the operation. Lying posteriorly these may be completely embedded in diseased nodes. They should be divided as far proximally as possible so as to avoid any subsequent redundancy and yet to allow an absolutely water-tight closure. The raw end should be covered with pleura or, if this is impossible, it should be well bedded in cellular tissue. Unless extremely careful post-operative supervision is available, the pleural cavity should be drained in all types of case. This drain must be water-tight and should be removed in two to three days. *R. T. Burkitt.*

Surgical Treatment of Congenital Pulmonary Stenosis. POTTS, W. J. (1949). *Ann. Surg.*, **130**, 342.

Treatment and its results are reviewed with reference to 181 cases of congenital cyanosis due to defective pulmonary circulation in children aged from 10 weeks to 17 years. Of the cyanotic children with congenitally abnormal hearts, 60% suffered from Fallot's tetralogy and these typically had an elevated erythrocyte count, a normally shaped or boot-shaped heart, a basal systolic murmur, clear lung fields, and right axis deviation. The remaining 40% of cases were due to all manner of abnormalities, many of which could not be relieved surgically; but operation was refused to none if it was demonstrable that cyanosis was due to diminished pulmonary blood flow.

Cyclopropane anaesthesia was preceded by relatively heavy morphine premedication and given with a high oxygen concentration and controlled respiration. Oxygen requirement was diminished in the last 71 cases by maintaining a rectal temperature of 96° to 99° F. (35.5° to 37.2° C.), according to the degree of cyanosis, by the use of a refrigerated water mattress. It is believed that mortality and morbidity from severe anoxia have thus been lessened.

In all children over 2 years of age the chest is entered by the 4th left interspace. If the aortic arch is on the left, aortic–pulmonary anastomosis is carried out; if on the right, Blalock's operation. In cases of emergency in infants of less than 1 year in whom the arch was on the right, a right-sided Pott's operation is performed.

For aortic–pulmonary anastomoses the left chest is opened in the 4th interspace, and the (usually small) pulmonary artery dissected free. The aorta is similarly cleared of pleura and mobilized by the ligation of about four intercostal arteries to permit the application of a Potts clamp. The part of the aorta to be occluded is increased by drawing it out between the jaws with tissue forceps; after the jaws have been closed the incision is made exactly midway between them and exactly ½ inch (0.6 cm.) long. A bigger orifice puts too great

a load on the heart and a smaller does not give relief. The pulmonary artery, occluded distally and proximally by doubly encircling ligatures, is tied by them to the clamp and a matching incision is made in the vessel. The anastomosis is then performed with a continuous everting, full-thickness, single-layer, 00000 "deknatel" silk suture on a curved No. 9 atraumatic needle. The pulmonary artery is released, and then the aorta, the latter slowly to avoid too sudden a fall in blood pressure. The chest is always drained.

Patients are returned to an oxygen tent for at least 24 hours and the water-sealed drain is removed after two days. Laryngeal oedema occurred in 10 instances; tracheotomy may be required. In 165 operations (151 Potts, 14 Blalock) 16 patients (9.7%) died, six from cerebral accidents. It is noted, however, that more cerebral accidents occurred before operation than after. Exploration alone was carried out in 16 cases with seven deaths (43.8%). The over-all mortality rate (23 deaths in 181 operations) was 12.7%.

Geoffrey Flavell.

The Surgical Relief of Congestion in the Pulmonary Circulation in Cases of Severe Mitral Stenosis. Preliminary Report of Six Cases Treated by Means of Anastomosis Between the Pulmonary and Systemic Venous Systems. SWEET, R. H., and BLAND, E. F. (1949). *Ann. Surg.*, **130**, 384.

In 10% of patients with rheumatic disease of the mitral valve stenosis is the dominant lesion, and some of these suffer from repeated attacks of pulmonary oedema, especially during pregnancy, menstruation, emotion, or severe exertion. The stenosis causes increase in pulmonary pressure and congestion and this in turn leads to right ventricular hypertrophy, so that during stress excess blood is pumped into the already congested pulmonary circulation and the patient often dies from pulmonary oedema instead of heart failure.

In six such cases the following operation proved helpful. Patients were given thiopentone in bed to avoid excitement, and preparations were made to apply tourniquets to all four limbs and to venesect should pulmonary oedema occur. A standard right thoracotomy through the bed of the 6th rib was then performed and the inferior pulmonary vein was exposed from behind and its dorsal-lobe branch isolated to its origin. The azygos vein was then exposed from a point 3 cm. below this to its junction with the highest intercostal vein; a bulldog clamp was applied to the end of the dorsal-segment vein, which was then cut at its origin and its tributaries tied; finally, the azygos vein was clamped as proximally as possible and ligated and cut approximately 2 cm. below the level of the pulmonary vein. With a Blakemore–Lord vitallium tube the intimal surface of the cardiac end of the divided azygos vein was then joined to the cut dorsal-lobe vein by ligature round the tube, the avoidance of sutures minimizing danger of thrombosis. Clamps were then removed and blood flowed from the pulmonary vein into the azygos vein, so that a relieving shunt from the high-pressure area was inserted. At operation left auricle pressure in three patients dropped from 425 to 390 mm.; 530 to 379 mm.; and 460 to 370 mm. water respectively.

Of the six patients, one died of an exacerbation of rheumatic endocarditis; in two the operation is too recent to assess; the remaining three, who had been semi-invalid, are now leading normal lives.

Geoffrey Flavell.

Decortication in Pulmonary Tuberculosis Including Studies of Respiratory Physiology. GORDON, J., BROOK, R., and WELLES, E. S. (1949). *J. thorac. Surg.*, **18**, 337.

Decortication of the lung is a measure which may allow restricted lung to expand again to an extent which approaches its normal volume. In simple clotted fibrothorax (haemothorax) or empyema a good result may be expected since the lung of itself will not have undergone any scarring or inflammatory change which would prevent its re-expansion. In tuberculosis, however, the fibrosis produced in the lung by the infective process may not permit such an effective mechanical result. The present detailed and excellent study represents an attempt to come to some conclusions on this point.

T. Holmes Sellors.

Bilobectomy—Surgical and Anatomic Considerations in Resection of Right Middle and Lower Lobes through the Intermediate Bronchus. LINDSKOG, G. E., LIEBOW, A. A., and HALES, M. R. (1949). *J. thorac. Surg.*, **18**, 616.

The diffuse character of some forms of bronchiectasis means that more than one segment or lobe has to be removed if the disease is to be eradicated. The authors record a series of 140 cases in which only one lobe was involved on 52 occasions. Only the right middle and lower lobes were affected in 19 cases, and the authors give a detailed account of the bronchial and vascular anatomy of these two lobes, which may be removed together rather than separately. Useful illustrations and descriptions of some of the more common variations in blood vessel distribution are given.

T. Holmes Sellors.