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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 sections.*

## Experimental

**The Blood Flow through an Atelectatic Lung.** BJÖRK, V. O., and SALÉN, E. F. (1950). *J. thorac. Surg.*, **20**, 933.

The authors produced acute atelectasis in the dog by introducing a Carlen's double-lumen bronchospirometry catheter and sucking off all the air from the right lung. Atelectasis was confirmed radiologically, and the blood flow through the lungs was then investigated by angiocardiography. The arterial oxygen saturation was also determined. Chronic atelectasis was produced by ligation of all the bronchi to the right lung at thoracotomy; similar investigations were made at intervals of 3 days to 8 months afterwards. In an acute atelectasis the pulmonary arteries do not become smaller, and the capillary bed remains open as indicated by simultaneous filling with a contrast medium of pulmonary arteries and veins on both sides. The arterial oxygen deficit is approximately equal to that present when the same lung breathes 100% nitrogen. The blood flow through an atelectatic area becomes progressively less during the first month until practically no blood is passing through, but there is no decrease in size of the main branches of the corresponding pulmonary artery.

In a long-standing atelectasis the pulmonary artery is somewhat reduced in size and the blood flow is found to be much slowed or even arrested. It is assumed that the capillaries have closed down in the same way as in a resting part of an organ. *F. J. Sambrook Gower.*

**Arteriovenous Shunts in the Human Lung.** TOBIN, C. E., and ZARIQUIEY, M. O. (1950). *Proc. Soc. exp. Biol., N.Y.*, **75**, 827.

It has been shown that glass spheres many times the accepted diameter of capillaries will pass through the pulmonary vessels of dogs and rabbits. Fresh human lungs from 20 normal adults and 3 newborn infants were therefore perfused through the pulmonary artery with saline, to which had been added several hundred glass spheres varying in diameter from 10 to 750 $\mu$. The perfusate was collected from the pulmonary vein, and examination under ultra-violet light, which increases visibility, showed the presence of spheres up to 500 $\mu$ in 9 adult and 2 neonatal lungs. When the remaining lungs were injected with liquid latex or vinyl acetate and the blood vessels dissected, spheres of similar diameter were present in the pulmonary veins; spheres larger than this had lodged in the pulmonary artery. Radio-opaque media added to the injection mass in 6 adult lungs demonstrated the site of the largest arteriovenous shunts at the apex of the lobular divisions of the bronchopulmonary segments, with smaller shunts at the level of the bronchioles (50 to 100 $\mu$) and alveolar sacs (20 to 25 $\mu$). *A. Paton.*

**Effect of High and Low Oxygen Levels and Intermittent Positive Pressure Breathing on Oxygen Transport in the Lungs in Pulmonary Fibrosis and Emphysema.** MOTLEY, H. L., and TOMASHEFSKI, J. F. (1950). *J. appl. Physiol.*, **3**, 189.

The elevated alveolar–arterial oxygen gradients of hard-coal miners with silicosis and other respiratory conditions were studied, and the effects determined of breathing 11·5 to 27·8% oxygen in nitrogen, and of intermittent positive-pressure breathing with compressed air. The difference in the oxygen partial pressures of the inspired air and alveoli was termed the aeration gradient; that between the arterial blood and alveoli, the transfer gradient.

The authors found that patients breathing a low level of oxygen showed a decreased transfer gradient, whereas at high levels it was increased. With low mixtures the aeration gradient decreased, but with mixtures richer in oxygen it increased. Intermittent positive-pressure breathing produced a decrease in both aeration

and transfer gradients and a marked increase in arterial oxygen. It is suggested that intermittent positive-pressure breathing increased the arterial oxygen saturation by inflating alveoli the ventilation of which was otherwise impaired, thus producing more uniform alveolar aeration. The increased alveolar–arterial oxygen gradients in these cases is therefore attributed to inadequate alveolar aeration rather than to increased resistance to diffusion in the pulmonary membrane. *D. H. Sproull.*

**The Lobe of the Azygos Vein, with Special Reference to its Bronchial Tree.** [In English.] DE MINJER, A. (1949). *Arch. chir. neerl.*, **1**, 232.

The author reviews the literature relating to the azygos lobe of the lung and describes in detail four cases which he has encountered. Particulars are given of the bronchial distribution in these cases in which, in common with other authors, he found no abnormal bronchial branching, suggesting that the lung plays a passive part only in the development of the anomaly, which is primarily due to the presence of an aberrant mesentery of the azygos vein. He did, however, find associated pulmonary and vascular abnormalities in one of the four cases. *J. R. Belcher.*

**Some Comparative Experiments on the Effect of Streptomycin and *o*-Aminophenol upon the Tubercle Bacillus.** [In English.] SAGARA, S., TAKAMORI, M., and ITO, R. (1949). *Jap. med. J.*, **2**, 119.

*o*-Aminophenol was shown to have a bacteriostatic effect on the tubercle bacillus *in vitro* which is twice that of streptomycin; it was inhibitory in a dilution of 1 in 2,560,000. In guinea-pigs a single subcutaneous injection of 75 mg. of either drug conferred tuberculostatic properties on the blood, but the effect of streptomycin continued for longer than that of *o*-aminophenol. *o*-Aminophenol, however, was less toxic for guinea-pigs than was streptomycin. *G. M. Findlay.*

## Tuberculosis

**Study of Adolescent Children Inoculated with BCG in Early Infancy.** LEVINE, M. I. (1950). *Pediatrics*, **6**, 853.

Radiographs of the chests of 298 patients between 12 and 23 years of age who had been inoculated with B.C.G. in infancy, and of 286 controls of similar age distribution, were studied and compared with radiographs taken during the first 5 years of life. All the patients were originally from tuberculous homes. As was to be expected, evidence of healed primary tuberculous lesions was found more commonly in the uninoculated (27) than in the group vaccinated with B.C.G. (since the primary focus is at the site of injection in these cases). Three of the inoculated patients were demonstrated to have a healed primary complex in the lung, but there was reason to believe that the vaccination had been inadequate or unsuccessful in each case; 2 others in the vaccinated group showed evidence of reinfection tuberculosis, and in one of these the response to B.C.G. had been weak and transitory. There were no deaths, and no cases of miliary tuberculosis or meningitis occurred in either group.

This study did not provide any evidence to support the belief that B.C.G. inoculation in infancy reduces tuberculosis morbidity in adolescence, but suggests that re-vaccination whenever the skin reaction becomes negative, and measures to maintain potency of the vaccines, might prove valuable. *M. Baber.*

**Tuberculous Superinfection after B.C.G. Vaccination.** VUILLEUMIER, P. (1950). *Schweiz. Z. Tuberk.*, **7**, 300.

This paper records the follow-up of 79 tuberculin-negative probationer nurses who were vaccinated with B.C.G. by the scarification method, and subsequently observed for periods of between 2 and 69 months, with a mean of 30 months. Between one-quarter and one-fifth had reverted to the negative state at the end of the period of observation. The local appearance of tuberculin skin tests, repeated throughout the period, suggested hypersensitive reactions, probably caused by superadded tuberculous infection, in one-fifth of those observed. Half of those followed up for 3 years or longer (27 in all) were found to become hypersensitive, in one-quarter the intensity remained the same throughout, and one-quarter reverted to the negative state. In a similar group observed at a time when B.C.G. vaccination was not carried out (102 probationers followed up for at least 3 years between 1935 and 1942) one-quarter remained negative, one-quarter again showed an unvaried positive reaction once they had changed, and one-half showed hypersensitive reactions. Only 3·6% of the total group protected with B.C.G. developed some form of tuberculosis, whereas in the pre-B.C.G. group

18·6% became affected. It thus appears that immunization with B.C.G. does not prevent subsequent tuberculous infection, but offers a high degree of protection against its clinical manifestations. *W. G. Harding.*

**A Controlled Investigation of Streptomycin Treatment on Pulmonary Tuberculosis.** LONG, E. R., and FEREBEE, S. H. (1950). *Publ. Hlth Rep., Wash.*, **65**, 1421.

In July, 1947, the Tuberculosis Study Section of the U.S. National Institutes of Health was asked to plan and direct clinical trials of streptomycin therapy in the treatment of tuberculosis. By March, 1950, observations over a period of 12 months had been completed in a total of 541 patients, and the authors here present a preliminary analysis of the results. Physicians in different parts of the country who participated in the trial adopted a common scheme of treatment and made uniform observations at uniform intervals. The inquiry included "the broad range of pulmonary tuberculosis, excluding only minimal disease at one extreme and terminal disease at the other." The clinical investigators submitted *x*-ray films and other findings in cases which they considered suitable for the study, the choice being made by a central panel. It was determined by chance for each hospital whether a case should be allocated to the streptomycin or control group. Patients in the former group were given 20 mg. of streptomycin per kg. body weight for 91 days. In addition, all patients in both groups received any other forms of therapy, including collapse therapy and surgical procedures, which the individual clinician thought was indicated.

About 40% of the patients were negroes, and there were slightly more males than females. Approximately half of the patients were between 25 and 44 years of age. Surgical or collapse procedures had been used in about one-fourth of the cases in each group at the time of selection for study. Nearly half of both groups were judged to have predominantly caseous disease; the disease in most of the others was predominantly exudative, being fibrotic only in a small remainder. The disease was classified as acute in two-fifths of the total, subacute in another two-fifths, and chronic in the rest. The number of patients in the control group leaving hospital against medical advice during the period of the trial was 35 compared with 22 in the streptomycin group.

During the 12-month observation period, 21 deaths occurred in the streptomycin group and 40 in the controls, but the difference in mortality was confined almost entirely to the first 6 months of observation, when 26 controls and only 8 treated patients died. The mortality was higher among males than females, and higher among non-whites than among whites. The control group showed a much slower decrease than the streptomycin group in the proportion of markedly febrile patients, but at the end of 12 months contained fewer patients with temperatures above 99·6° F. (37·6° C.) than the streptomycin group (the greater number of deaths must, however, be taken into account). Loss of fever was much less common among the controls than among the streptomycin group. At the end of 12 months 24·5% of the controls were bacteriologically negative, as against 38·2% of the streptomycin group. *X*-ray changes were evaluated by a panel of four radiologists. There was lack of agreement in a large number of cases, in which the percentage distribution of opinion was taken as the index of radiological status. In the streptomycin group, about seven-tenths had improved by the end of 3 months; within this group there was continued improvement during subsequent periods. The proportion showing no change since the beginning of the study decreased from 16% at 3 months to about 7% at the end of 12 months; the proportion showing deterioration increased very slowly as that showing no change decreased. Among the controls, change was much slower and less dramatic. At the end of 3 months the condition of 25% of the patients was still unchanged, this proportion gradually declining to about 10% at the end of one year.

*M. Daniels.*

**Three-year Follow-up Study on 202 Cases of Pulmonary Tuberculosis Treated with Streptomycin.** CANADA, R. O., ALLISON, S. T., D'ESOPO, N. D., DUNNER, E., MOYER, R. E., SHAMASKIN, A., TEMPEL, C. W., and CHARTER, W. V. (1950). *Amer. Rev. Tuberc.*, **62**, 563.

This paper records a follow-up, after 3 years, of 202 out of 223 patients treated under the U.S. Veterans Administration project. The majority of patients were young men with an acute tuberculous lesion. They received a total daily dosage of 1·8 to 2·0 g. of streptomycin for 120 days. Relapse occurred in 24% of the patients towards the end of the treatment and during the first 4 months afterwards.

After 3 years, 56 patients had died of tuberculosis; in 56 the disease remained active or quiescent; in 11 it was apparently arrested; and in 64 it was arrested. The mortality in

patients under 25 years of age was 35%, compared with 23% in the group over 25 years of age. However, the disease had become inactive more often in the younger group of patients who were still living 3 years after treatment (68% compared with 53% in the older group). *X*-ray examination of 101 patients showed a decrease in the degree of improvement and an increase in the degree of deterioration during the post-treatment period. Inclusion of the 4-month treatment period made a considerable difference to the degree of improvement observed. Marked improvement was noted almost three times as often during the interval from the beginning of treatment until the time of follow-up as during the interval from the end of treatment to the time of follow-up. Sputum conversion occurred during treatment in 46 of 187 patients (25%), and during the years following treatment an additional 25% became negative. There was no indication of any decrease in the incidence or degree of resistance to streptomycin during the 3 years following treatment. Of 100 patients who had vertigo or ataxia during treatment, 91 still had symptoms in some degree; in none had they become worse.

*Kenneth Marsh.*

**Tomographic Study of the Bronchi Draining Tuberculous Cavities.** FRANCHINI, C., and MORGANA, A. (1950). *Radiol. med., Torino*, **36**, 818.

This paper is based on a series of over 3,500 tomographic examinations of tuberculous lesions of the lungs performed at the Sondalo Sanatorium Village and the Institute of Radiology of the University of Pavia. In most cases a standard technique was used, but in some the patient was tilted into a position such that the bronchus draining the affected area was parallel to the table in order to demonstrate its entire length; in some cases a lateral projection was also used. Usually the bronchus draining an apical cavity leaves it at its inferior margin, whereas those draining the less common middle-third and basal cavities leave at the medial and superior margins respectively. Sometimes two or more bronchi drain a large cavity and then unite; but if the large size of the cavity is due to tension from valvular stenosis there will be a single draining bronchus. In well-drained cavities the junction with the bronchus is abrupt, giving a typical "tennis-racket" shape; in others it is ill-defined, producing a funnel shape, probably due to necrosis around stagnant material.

The authors divide the specific bronchial lesions into three main types: (1) exudative or caseous; (2) productive or granulomatous; and (3) ulcerative. They give some details of the pathology of each type. Radiologically, the exudative type shows accentuation of the parallel-line shadows. When the condition progresses to caseation there will be irregular thickening of the walls and possibly obliteration of the lumen. The ulcerative type shows dilatation of the bronchi with thinning of the walls and perhaps small cavities due to herniation between the cartilages. Association of bronchial with peri-bronchial lesions, particularly of the caseous or granulomatous types, causes the disappearance of the bronchial lumen with formation of uniform, ribbon-like shadows.

The tomographic examination of the draining bronchus may provide answers to some interesting questions, such as the following: (1) When the sputum becomes negative after collapse therapy, is this due to closure of the cavity or to angulation and stenosis of the bronchus? Probably both factors are usually involved, but stenosis of the bronchus precedes closure of the cavity. (2) Formation of tension cavities; these may follow collapse therapy or be due to extrinsic and intrinsic organic factors affecting the bronchus, such as partial block by caseous material. The draining bronchus becomes obscured by an atelectatic zone and the cavity is ball-like with a smooth, well-defined wall. (3) Spontaneous closure of cavities. Moreover, recognition of a draining bronchus helps in differentiation between cavities and pseudo-cavities such as emphysematous bullae and in the detection of cavities in the presence of collapse therapy. Study of the draining bronchus may also influence treatment; for example, unsuccessful collapse therapy may occlude a partially stenosed bronchus and produce a tension cavity: in such cases the use of Monaldi's drainage should be considered, or attention directed towards improving the bronchial condition before intervening with collapse therapy with undesirable results.

*Sidney J. Hinds.*

**Selective Bronchography with a Métras Catheter and Water-soluble Contrast Medium in Pulmonary Tuberculosis.** HOPPE, R., and MAASSEN, W. (1950). *Tuberkulosearzt*, **4**, 708.

The new bronchographic method here described makes use of a water-soluble, viscous contrast medium, "per-abrodil M," in 50%

concentration. In contrast to iodized oil this substance is quickly eliminated, being easily absorbed by the lung parenchyma. Hereby the risk of the contrast medium causing intracanalicular spread is reduced to a minimum. The water-soluble fluid mixes readily with the bronchial secretion and penetrates easily into the bronchioles and through passages narrowed by stenosis. The contrast medium is injected directly into the selected area through a Métras catheter. This semi-rigid tube, which is either straight or curved at the end, has a radio-opaque tip, which permits of its insertion under *x*-ray control. Thorough anaesthesia with 2 to 4 ml. of 2% butethanol through a curved laryngeal cannula is essential. With this method even the bronchus to the upper lobe can be filled in the upright position.

Normal filling of bronchi and alveoli excludes tuberculosis within the area visualized. Bronchography, though unsuitable for the demonstration of cavities, shows up bronchiectasis and bronchial stenosis where ordinary radiography and tomography have failed. Another important field for bronchography is in cases of bronchial stenosis situated beyond the range of bronchoscopy. Of a series of 25 cases of all forms of pulmonary tuberculosis, with collapse in approximately 50%, bronchography demonstrated the presence of bronchial stenosis, bronchiectasis, or both in three-quarters, appearances being normal in the remainder.

Bronchography is contraindicated in the following tuberculous conditions: febrile and mainly exudative cases, early infiltration, early cavitation, freshly spreading, cavernous processes with more than 4 oz. (120 ml.) of sputum a day, haemoptysis, laryngeal tuberculosis, recent induction of pneumothorax, and recent pneumolysis. A poor general condition and a tendency to allergic reactions, thyrotoxicosis, and acute and decompensated heart or renal failure are also contraindications. Bronchograms of the upper lobe are reproduced, demonstrate the position of the catheter, and illustrate the potentialities of the new method.

*E. G. W. Hoffstaedt.*

**Asymptomatic Hyponatremia in Pulmonary Tuberculosis.** SIMS, E. A. H., WELT, L. G., ORLOFF, J., and NEEDHAM, J. W. (1950). *J. clin. Invest.*, **29**, 1545.

This investigation was carried out at Yale University School of Medicine, and its purpose was to find out why patients suffering from pulmonary disease sometimes have low serum sodium levels. Ten patients of both sexes, aged between 43 and 63 years, were studied; 9 of them had advanced pulmonary tuberculosis and one miliary tuberculosis. All were severely undernourished, with loss of weight, low serum protein level, and low blood pressure, and most of them had other diseases at the same time, such as carcinoma or arteriosclerosis. On ordinary hospital diet with a free intake of salt these patients had a low serum sodium level, but they excreted large amounts of sodium in their urine. When 6 were made to eat large amounts of salt the serum sodium level remained low, though slight increase was generally noted; their urinary excretion of sodium, however, became very high. When 5 patients were given very small amounts of salt to eat their excretion of sodium was low. Symptoms associated with salt depletion were usually absent. Intravenously injected sodium was retained normally. The renal clearances of these patients were normal, though somewhat on the low side, and there was no other evidence of kidney failure. The response to deoxycortone, moreover, was normal—namely, a reduction in salt excretion. All this suggests that the kidney tubules were able to reabsorb sodium and that renal failure could not have caused this syndrome. There was no evidence of adrenocortical insufficiency either clinically or in various tests, and the adrenal cortex was normal in the 6 patients who ultimately came to necropsy. The total amount of extracellular water was apparently normal, and this may explain why symptoms usually associated with salt depletion were absent. All the evidence taken together suggested that the cause of the disturbance was in the cells of the body, and the hypothesis is guardedly put forward that a reduction of the osmotic pressure in the cells was followed by a lowering of the osmotic pressure of all body fluids. The authors also present some evidence to suggest that a lowering of the serum sodium level is not directly associated with tuberculosis, but that it may be present in any severe illness with malnutrition.

*E. M. Glaser.*

**Eye Lesions after B.C.G. Vaccination.** FRANDSEN, E. (1950). *Nord. Med.*, **44**, 1307.

Unilateral eye lesions were found in three youths within 2, 3, and 18 months of B.C.G. vaccination, respectively. All had previously been Mantoux-negative and were now Mantoux-positive; in none of them had there been a general reaction to vaccination. The lesions were typical of tuberculous infec-

tion of the eye. A subcutaneous injection of 2 mg. of tuberculin given to one of the patients after the condition had been quiescent for a month produced fresh precipitates on the posterior surface of the cornea and a rise in temperature.

Thorough clinical and laboratory investigations failed to reveal any evidence of local or general disease which might have accounted for the lesions. *W. G. Harding.*

**Survival of Tubercle Bacilli in Various Sewage Treatment Processes. I. Development of a Method for the Quantitative Recovery of Mycobacteria from Sewage.** PRAMER, D., HEUKELEKIAN, H., and RAGOTZKIE, R. A. (1950). *Publ. Hlth Rep., Wash.*, **65**, 851.

The authors have devised a method for the quantitative estimation of tubercle bacilli in sewage; by their technique about 90% of the sewage organisms normally present can be suppressed. This method, which is described in detail, was employed to assess, in a laboratory experiment, the effect of various sewage treatments on the survival of tubercle bacilli. Chemical coagulation with ferric chloride and continuous sand filtration were highly effective. Chlorination was satisfactory only when a concentration of at least 0.9 part of free chlorine per million was attained. In a preliminary field trial, sanatorium sewage which was processed by sedimentation, trickling filtration, and chlorination was examined at various stages. Acid-fast bacilli were found in the plant effluent and the stream receiving it, as well as in the raw and digested sludge. *W. G. Harding.*

## Neoplasm

**B.C.G. Vaccination in Sarcoidosis.** ISRAEL, H. L., SONES, M., STEIN, S. C., and ARONSON, J. D. (1950). *Amer. Rev. Tuberc.*, **62**, 408.

A study of B.C.G. vaccination under controlled conditions in 20 patients with sarcoidosis indicates that patients with this disease are unable to develop and maintain skin sensitivity to tuberculin. Atypical local reactions occur at the site of vaccination in a small number of patients with sarcoidosis, but, in the majority, the local reaction is indistinguishable from normal. Vaccination with B.C.G. does not provide significant assistance to the clinician as a diagnostic or therapeutic agent.

The failure of development of skin sensitivity to tuberculin in patients with sarcoidosis does not establish sarcoidosis as an anergic form of tuberculosis. The tuberculin anergy exhibited by patients with sarcoidosis appears to be non-specific, due to interference with general immunologic mechanisms.—[Authors' summary.]

**Sarcoidosis: a Survey, with Report of Thirty Cases.** ROBINSON, B., and POUND, A. W. (1950). *Med. J. Aust.*, **2**, 568.

This Australian survey of sarcoidosis largely bears out the conclusions as to its aetiology and characteristic features which were arrived at by the conference on sarcoid of the National Research Council, Washington, in 1948. The history of the subject is briefly outlined, and the authors describe the very typical histological lesion with its characteristic granuloma going on to fibrosis. They state that "where any doubt has been raised in our minds as to the histological diagnosis of this 'sarcoid reaction,' the ultimate diagnosis has proved to be that of some other condition." The lesion is not specific to this particular disease, non-caseating tubercles of this type also occurring in leprosy, brucellosis, beryllium poisoning, fungus infections, and certain other conditions. The non-caseating granuloma of tuberculosis can only be distinguished by finding tubercle bacilli.

The present series of patients was collected over a period of 3 years from many sources in Australia, 75 suspects being examined, of whom 30 proved to be cases of sarcoidosis. The features of these cases are described in some detail. The diagnostic criteria used were: (1) the presence of a group of signs suggestive of the disease; (2) the typical histological appearances of biopsy material; (3) the chronic and relatively asymptomatic course of the disease; (4) failure to demonstrate the tubercle bacillus by any method; (5) the absence of tuberculin sensitivity, which may change during the course of the disease. The age at which overt signs were first noted ranged from 17 to 60 years; in 17 cases the onset was between 25 and 35, in 6 between 50 and 60. The sexes were equally represented. The duration of the disease and of individual lesions varied greatly; in some cases it extended over 20 years, in others it cleared in a few months.

The organs most often involved were: lungs, lymph nodes, skin, and eyes; these, however, are accessible organs and various others may be involved; in the one case coming to necropsy, much more extensive visceral involvement was

found than had been suspected during life. Superficial lymph nodes were enlarged in 27 cases, and the mediastinal nodes in 18, of which in one there was no enlargement of superficial nodes. The skin was involved in 11 cases, always with other organs. Lungs were affected in 21 cases, and only one of these was discovered by routine *x*-ray examination. The upper respiratory tract showed lesions in 4 patients, the nose and accessory sinuses in 4, and the larynx in one. Eyes were involved in 6 cases, but no patient had a fully developed Heerfordt's syndrome. Bone was affected in only one patient in which the lesion was associated with gross lupus pernio of the overlying skin. Hepatic enlargement occurred in 11 cases; out of 3 liver biopsies positive results were found in 2. The spleen was enlarged in 6 patients, but never grossly. No significant anaemia was found; 2 patients had mild polycythaemia associated with extensive lung lesions. Monocytosis occurred in 13 cases and eosinophilia in 3 (in one of which it was due to hydatid cyst of the lung). The serum protein level was over 8 g. per 100 ml. in 10 out of 27 cases examined, due in all except 2 to increased globulin content; the increase was always related to widespread disease. Tuberculin sensitivity was extensively tested; 3 patients were positive to 1 in 1,000 old tuberculin and one to 1 in 100; none was sensitive to avian tubercle bacilli. The Wassermann and Kahn reactions were always negative. Attempts to isolate tubercle bacilli from various sources and virus from biopsy material failed.

The forms of treatment tried included *x* rays and calciferol in doses of 30,000 to 100,000 units daily for some months; these had some, but variable, effect. Streptomycin, penicillin, arsenicals, bismuth, gold, and ultra-violet rays were all without effect. The disease is interpreted as a chronic infective process of unknown aetiology. *M. C. G. Israëls.*

## Pneumonia and Emphysema

**Severe, Sporadic Virus Pneumonias. Diagnostic and Therapeutic Problems.** REIMANN, H. A. (1950). *J. Amer. med. Ass.*, **144,** 81.

The author describes 7 cases of severe sporadic pneumonia of presumed virus aetiology. The clinical picture was indistinguishable from that seen in the epidemic form of virus pneumonia. No causative organisms could be demonstrated. Cold agglutinins were present in one case only. In 4 patients complement-fixation tests were found to be negative for one or more of the viruses known to cause pneumonia. [Serological investigations were not carried out in all cases.] *J. R. Bignall.*

**Acute Primary Klebsiella Pneumonia.** NATARO, M., SHAPIRO, D., and GORDON, A. T. (1950). *J. Amer. med. Ass.*, **144,** 12.

The authors have treated 5 patients with pneumonia due to *Klebsiella pneumoniae* (Friedländer's bacillus), 4 with streptomycin, and one with aureomycin. Of the streptomycin-treated patients, 3 recovered slowly and the fourth died; the patient receiving aureomycin recovered rapidly. Ten other published cases of streptomycin-treated klebsiella pneumonia are reviewed. The over-all mortality in these 14 cases was 20%, which compares favourably with previously reported mortality of 50 to 97% in similar cases treated with sulphonamides and penicillin. The authors found that with streptomycin treatment the incidence of subsequent pulmonary fibrosis diminished. They therefore conclude that streptomycin is an effective drug in this disease.

Aureomycin has apparently not been used before for klebsiella pneumonia. Its dramatic effect in the one case reported here suggests that it deserves further trial. *John R. Forbes.*

**Pneumococcal Pneumonia at Jefferson Hospital.** DE BERADINIS, C. T., and DE ANDINO, A. M. (1951). *Amer. J. med. Sci.*, **221,** 1.

A group of 75 cases of pneumococcal pneumonia, treated in the Jefferson Hospital between the years 1937 and 1940, are compared with a similar group of 91 cases treated between 1946 and 1949. Group (1) constituted 1·06% of all ward admissions and Group (2) 1·05%.

In recent years there has been a marked increase in the higher-numbered bacteriological types of pneumococci and a decrease in the lower-numbered types, especially Type I. The number of patients above the age of 50 in Group (1) was 26·6% compared with 47·2% in Group (2). The typical signs of lobar consolidation were found in 84% of cases in Group (1), and in only 27·1% in Group (2). Purulent complications occurred less frequently in the second group (7·7% compared with 16%), but the mortality of these (50%) was the same in both groups. In Group (1) there were 16 deaths, a mortality rate of 21·3%, but in 1939, after the introduction of sulphonamides, the mortality rate fell to 5%. In Group (2), in which all the

cases were treated with penicillin, there were 6 deaths, a mortality of 6·5%.

In Group (2) all the patients who died were over the age of 40, and it is considered that, despite the advent of antibiotics, the presence of complicating degenerative disease after the age of 40 is still of important prognostic significance. *A. Gordon Beckett.*

**Atypical Pneumonia.** STUART-HARRIS, C. H. (1950). *Brit. med. J.*, **2,** 1457.

**Primary Atypical Pneumonia.** BEDSON, S. P. (1950). *Brit. med. J.*, **2,** 1461.

**Treatment of Primary Atypical Pneumonia in Children with Aureomycin. Report of Nineteen Cases.** ANDERSON, C. E. (1950). *Amer. J. Dis. Child.*, **80,** 533.

**An Evaluation of Aureomycin Therapy in Primary Atypical Pneumonia.** SCHOENBACH, E. B., SWEED, A., TEPPER, B., and BRYER, M. S. (1950). *New Engl. J. Med.*, **243,** 799.

A series of 22 patients admitted with primary atypical pneumonia in 1946–7, and 33 patients admitted during 1948–9 treated with aureomycin alone, are compared. Similar diagnostic criteria were used and the patients were roughly comparable in age, sex, and severity of the disease. The dosage of aureomycin varied considerably, but was most frequently 250 mg. each hour for 3 to 4 doses, followed by 250 mg. every 2 hours for the ensuing day, then 250 mg. every 4 to 6 hours for several days. The average durations of fever in hospital were $6{\cdot}4 \pm 0{\cdot}85$ days in 1946–7 and $3{\cdot}1 \pm 0{\cdot}07$ days for the aureomycin-treated patients ($1{\cdot}8 \pm 0{\cdot}23$ days after the beginning of aureomycin therapy).

*J. W. Litchfield.*

**Roentgenologic Aspects of Diffuse Miliary Granulomatous Pneumonitis of Unknown Etiology. Report of Twelve Cases with Eighteen Months' Follow-up.** FELSON, B., JONES, G. F., and ULRICH, R. P. (1950). *Amer. J. Roentgenol.*, **64,** 740.

The roentgenological findings observed in an unusual epidemic of an acute illness encountered in 12 men who had been engaged in cleaning an abandoned water tower are presented. Widespread miliary lesions were demonstrable in the lungs of all 12 patients. Although clinical recovery was rapid, the roentgen changes regressed slowly. In 4 of the 12 cases, minimal pulmonary involvement was still detectable from 14 to 18 months after onset. The cause of the epidemic was not established. Reports of three similar epidemics were encountered in a review of the literature. [Authors' summary.]

**Nonspecific Pneumonitis of the Left Upper Lobe (Simulating the "Middle Lobe Syndrome" and Producing an Early Superior Pulmonary Sulcus Syndrome). Report of Case.** ASHE, W. M., MCDONALD, J. R., and CLAGETT, O. T. (1951). *J. thorac. Surg.*, **21,** 1.

A single case is described and is worthy of record for the reasons given in the title. A pregnant woman of 33 developed pain in the left shoulder and arm following a cough. She had a swelling above the clavicle, but Horner's syndrome was not present. An *x*-ray examination of the chest showed a dense, rounded shadow in the left upper lobe; bronchoscopy was negative. The findings at thoracotomy, like those at *x*-ray examination, suggested a malignant neoplasm. Upper lobectomy was performed. Examination of the specimen, however, revealed a dense fibrous mass, with chronic inflammatory changes, and enlarged hilar lymph nodes—resembling the so-called "middle lobe syndrome."

Although this case did not show all the features of the superior sulcus syndrome as described by Pancoast, several of them were present, disproving the contention that this syndrome is pathognomonic of malignant disease.

[The symptom of persistent pain of brachial-plexus distribution associated with inflammatory lesions of the lung is not uncommon.]

*M. Meredith Brown.*

**The Bronchogram in Pulmonary Emphysema.** SCARINCI, S. (1950). *Arch. Tisiol.*, **5,** 659.

The author points out the frequency with which patients with chronic dyspnoea diagnosed clinically as due to emphysema are found at necropsy to have normal alveoli. He emphasizes the importance of the bronchogram in arriving at an exact diagnosis and describes his technique of investigation of cases of dyspnoea of the emphysematous type, with reference to 4 illustrative cases. Films are taken at 5, 20, and 45 minutes, and again at 6 hours, after the injection of the contrast medium. This is done in order to avoid interpreting filling limited to the bronchi as pathological when it was in fact

a normal appearance. The first film in both normal and emphysematous subjects shows filling of the bronchi only, and is described as having the appearance of a dead tree. Subsequent films in normal subjects show alveolar filling which the author describes as resembling a tree in summer complete with all its foliage, whereas in emphysema they show filling of the larger bronchi only, the bronchioles and alveoli remaining empty as in the first film. The author claims that the "lily of the valley" appearance previously described as being due to incomplete filling of normal alveoli is in fact due to a lobular emphysema.

*John H. L. Conway-Hughes.*

**Pneumoperitoneum in the Treatment of Pulmonary Emphysema.** CARTER, M. G., GAENSLER, E. A., and KYLLONEN, A. (1950). *New Engl. J. Med.*, **243**, 549.

The authors investigated the effect of artificial pneumoperitoneum on 22 patients suffering from severe chronic bronchitis and emphysema, whom they describe as "pulmonary derelicts." In 3 patients the emphysema was secondary to pulmonary tuberculosis, and 3 had undergone thoracic operations and now had severe associated pulmonary emphysema.

The most striking effect of this treatment was a marked improvement in the strength of the cough, and more efficient raising of bronchial secretion. The relief of dyspnoea in the 3 cases of pulmonary tuberculosis led the authors to try this treatment in other patients suffering from severe chronic bronchitis and emphysema. Of the latter, 10 out of 16 were greatly improved in every way; all the patients stated that their cough was rendered more effective.

Fluoroscopy showed that in the emphysematous patients the diaphragm was so flattened as to be incapable of further contraction. After the induction of pneumoperitoneum, the normal diaphragmatic arch became restored and downward contraction again became possible. Studies of lung function revealed that the complementary air was the only component of the vital capacity which was altered by pneumoperitoneum treatment, the mean values being 1,388 ml. before and 1,729 ml. after treatment. The maximum breathing capacity was also increased from average values of 29 litres per minute before treatment to 37 litres per minute after treatment. The actual vital capacity determinations revealed only small and insignificant changes as a result of treatment.

*Maxwell Telling.*

**Artificial Pneumoperitoneum in the Treatment of Pulmonary Emphysema. A Preliminary Report.** FURMAN, R. H., and CALLAWAY, J. J. (1950). *Dis. Chest*, **18**, 232.

Artificial pneumoperitoneum as a method of treating pulmonary emphysema, although first introduced in 1924, has not hitherto been widely used. The authors here describe, in a preliminary report, 5 cases in which it has been usefully employed. It is an extension of the older form of treatment by abdominal binder and belt, and is directed towards raising and mobilizing the low, fixed diaphragm, thus reducing the residual air, increasing the vital capacity, and so greatly assisting the gaseous exchange. Carbon-dioxide retention and anoxaemia are the principal biochemical changes in emphysema.

In the 5 cases reported the position of the diaphragm on inspiration and expiration was studied fluoroscopically before and after the induction of pneumoperitoneum. Exercise tolerance was estimated by means of the Master 2-step test, a Millikan oximeter being used to measure the oxygen saturation of arterial blood, and the results equated with changes in the vital capacity. The latter was measured over a period of expiration limited to 3 seconds, because prolonged expiratory effort may enable emphysematous patients to reach almost normal values. The initial injection of air varied in volume between 400 and 1,200 c.cm., and was followed by refills at intervals of 3 days, 4 days, and finally of one week, a final pressure of 12 cm. water being aimed at. [In this the authors have probably been more thorough and persistent than most who have used this form of treatment.]

From the case histories given the improvement, both in the test results and the clinical condition, appears to have been quite definite. In one case it was 3 months before improvement started, but in another it was immediate: generally it was early. The vital capacity increased by 500 to 1,000 c.cm. in each case. Where asthma had been associated there was a startling reduction in the number of attacks. The treatment was tried in 2 additional cases, but had to be stopped because severe chest and shoulder pain occurred. Chronic infection of the lung bases and diaphragmatic adhesions were the complicating factors in these cases. The authors finally discuss briefly the contraindications and complications of this procedure and urge its further and more widespread trial in cases of emphysema. [Pneumoperitoneum undoubtedly appeared to have proved a valuable symptomatic therapeutic agent in their hands.]

*Ronald S. McNeill.*

## Asthma

**Evaluation of Therapeutic Substances Employed for the Relief of Bronchospasm. VII. Combinations of Diphenhydramine with Ephedrine and Aminophylline.** RUBITSKY, H. J., HERSCHFUS, J. A., LEVINSON, L., BRESNICK, E., and SEGAL, M. S. (1950). *J. Allergy*, **21**, 559.

Attacks of asthma were induced by the intravenous injection of either 0·01 to 0·05 mg. of histamine or 0·1 to 0·5 mg. of methacholine, the reduction of the vital capacity being recorded. The protective effect of a test substance was estimated by its ability to prevent this reduction of the vital capacity. Combinations of 50 mg. diphenhydramine ("benadryl"), 25 mg. ephedrine, and 200 mg. "aminophylline," given orally, had usually no more effect than the most potent single ingredient, whether two or three substances were given together. Aminophylline with diphenhydramine was an exception, but in this case, also, the increase in effect did not approach arithmetic summation.

*H. Herxheimer.*

**The Effect of Adrenocorticotropic Hormone (ACTH) and Cortisone on the Course of Chronic Bronchial Asthma.** CAREY, R. A., HARVEY, A. M., HOWARD, J. E., and WINKENWERDER, W. L. (1950). *Bull. Johns Hopk. Hosp.*, **87**, 387.

The authors' investigation was confined to cases of severe chronic asthma of 6 months' to 45 years' duration in which there had been constant symptoms for at least 2 months, and no relief from any other form of treatment. Adrenocorticotrophic hormone (ACTH) was given daily to 19 patients; the initial dose was 100 mg., which was gradually reduced, treatment being continued for periods varying from 4 to 21 days. In 15 of these patients there were complete subjective and objective remissions; the other 4 improved by 50% or more. Improvement was noted within 36 hours in all cases and often within 4 hours. The duration of complete remission varied from 3 days to 10 months, with an average of 68 days. In no case was relapse as severe as the original attack. Second courses of ACTH were given 6 to 224 days after a relapse, response being as prompt and complete as after the first course.

Cortisone was less effective. In 1 case of mild asthma there was a remission which lasted 51 days after 300 mg. of cortisone for 2 days, followed by 200 mg. for 9 days, but 4 more severe cases responded only partially to 200 mg. on the first day and 200 mg. daily for the next 7 days. Three cases also failed to respond subsequently to full doses of ACTH, in spite of a fall in the eosinophil count and an increase in 17-ketosteroid excretion. The eosinophil count fell by 72% or more in all except 2 cases, but a significant fall did not ensure response of the asthma, nor did the absence of a significant fall preclude it. Complete freedom from symptoms usually occurred, however, on the day of maximum response. The duration of the eosinophil response was no indication of the duration of remission. Skin sensitivity was partially or completely abolished during treatment, but tended to reappear a few days later.

The authors believe that, once the likely duration of remission for any one patient has been determined, intermittent courses of ACTH may keep the condition under continuous control.

*Robert de Mowbray.*



## Thoracic Surgery

**The Patent Ductus Arteriosus. Observations from 412 Surgically Treated Cases.** GROSS, R. E., and LONGINO, L. A. (1951). *Circulation*, **3**, 125.

When the shunt resulting from the presence of a patent ductus arteriosus is small the resulting disability is *nil*, with a larger shunt cardiac failure or embarrassment eventually develops, while in severe cases there are symptoms and retarded physical development from an early age. Subacute bacterial endocarditis ensues in 25% of cases. Other complications are rare. Some 97% of patients have the typical continuous murmur, and in them it develops by the fourth year. A systolic murmur only may be present at birth. The differentiation from cases of high ventricular septal defect with aortic incompetence is stressed. The electrocardiogram is useful in excluding other lesions; for instance, right axis deviation is unusual in uncomplicated patent ductus. Radiography usually shows slight or moderate enlargement, with a fullness of the pulmonary artery. Hilar dance and left auricular enlargement each occur in 50% of cases.

With ligation alone complete permanent closure was obtained in only 80% of the authors' cases; latterly they have divided the ductus in 369 cases, with no death from haemorrhage. The authors recommend operation for all cases with retarded physical development,

cardiac failure, or diminished capacity for effort, even up to the age of 50 if the disability is severe. In those infected cases which respond to chemotherapy operation is deferred for several months. Operation is recommended for young, asymptomatic patients when skilled surgery is available, but considered inadvisable in the middle-aged. The over-all mortality for complete division was 2·1%. In asymptomatic cases it was 0·5%. *Albert Venner.*

**The Arterial Route to the Aortic and Pulmonary Valves. The Mitral Route to the Aortic Valves.** BROCK, R. C. (1950). *Guy's Hosp. Rep.*, **99**, 236.

Surgical approach for the relief of pulmonary stenosis has hitherto been by way of the right ventricle; but the left pulmonary artery provides a direct route whereby the valves have been inspected several times during pneumonectomy. Since patients with severe pulmonary stenosis are subject to sudden collapse after thoracotomy, cardiotomy, which provides quicker and easier access, has been preferred, though puncture of the myocardium would seem the more traumatizing procedure. In younger patients, however, and especially those explored by a left posterolateral incision, where the exact nature of the obstruction is in doubt, attack by the arterial route might be advantageous, especially as the right ventricle is not so readily accessible. Even in children post-stenotic dilatation often provides a sufficiently large vessel for instrumentation which could be sutured after withdrawal, or one of whose branches might be employed and tied.

Similarly the aortic valves may be approached directly down the right subclavian or carotid arteries, and a case is detailed in which the former was so used, an operating cardioscope being passed down the divided vessel and the valves inspected; because of heavy calcification no division was attempted. It is suggested that for better control in future cases the sternum should be split to provide direct observation, and if necessary digital control, at the base of the aorta.

A patient with mitral stenosis and aortic regurgitation and stenosis is also discussed, in whom, after mitral commissurotomy, an attempt to palpate the aortic valve by passing a finger through the mitral ring resulted in avulsion of a papillary muscle controlling the aortic cusp of the mitral valve. Severe mitral regurgitation and death in 48 hours ensued.

*Geoffrey Flavell.*

**The Significance of Pulmonary Vascular Lesions in the Selection of Patients for Mitral Valve Surgery.** WELCH, K. J., JOHNSON, J., and ZINSSER, H. (1950). *Ann. Surg.*, **132**, 1027.

The surgical division of the mitral valve in advanced cases of mitral stenosis is becoming a sound and well-recognized procedure. Pure mitral stenosis is accompanied in about one-third of cases by a pulmonary hypertension as a result, the authors suggest, of the organization of pericapillary oedema causing narrowing of the pulmonary capillaries. This may be the origin of a secondary circulatory obstruction in the pulmonary circuit which may itself result in the death of a patient operated on successfully for mitral stenosis. The authors have experienced such a case.

It is important to recognize such cases preoperatively, and the following points are suggestive: (1) a history of prolonged disability; (2) long-standing evidence of venous engorgement not relieved by medical treatment; (3) severe dyspnoea on effort; (4) a large and excessively pulsatile pulmonary artery on screening; (5) a pulmonary arterial pressure of more than 100 mm. Hg as determined by cardiac catheterization. However, should the patient respond well to medical measures, with a normal venous pressure and arm-to-lung circulation time following treatment, and with a normal or near normal pulmonary arterial pressure, surgery is not contraindicated. *Peter Martin.*

**The Surgical Treatment of Giant Emphysematous Blebs and Pulmonary Tension Cysts.** DUGAN, D. J., and SAMSON, P. C. (1950). *J. thorac. Surg.*, **20**, 729.

During a recent 3-year period, the authors operated on 14 cases of giant emphysematous blebs either by lobectomy, segmental resection, or local excision. They point out that there is no great merit in distinguishing between blebs and bullae, as defined by Miller, but emphysematous blebs should be differentiated from intrapulmonary cysts. In their series the ages of the patients varied from 3 months to 60 years. All the patients had increasing dyspnoea; some complained of pain in the chest and others had frequent respiratory infections. The authors emphasize that radiographs are essential in diagnosis, and that bilateral disease is not a contraindication to surgery. Bronchograms are taken as a routine to rule out associated bronchiectasis, and these also help in determining the amount of normal lung that can be depended upon for re-expansion.

Of the 14 cases (15 operations) 10 were treated by local excision, 3 by segmental resection, and 2 by lobectomy. The condition was bilateral in 6. There was one operative death, and there was marked improvement in 12 of the 14. An adult with minimal symptoms, or one who is asymptomatic but whose radiograph shows localized emphysematous blebs, should be submitted to thoracotomy before tension or intracavitary infection develops.

*E. F. Chin.*

**Treatment of Giant Cysts of the Lung.** ALLBRITTEN, F. F., and TEMPLETON, J. Y. (1950). *J. thorac. Surg.*, **20**, 749.

The authors discuss the pathogenesis and mechanics of giant cysts of the lung. They state that the factors common to all these cysts are: (1) bronchiolar or alveolar damage; (2) fibrous tissue formation; (3) a valve-like entrance of air to the space. Cysts of equal size and clinical characteristics may arise from a congenital lesion; and either the congenital or acquired cyst may cause complete disappearance of the lung. In their view it is impossible to differentiate between epithelized and non-epithelized balloon cysts, and they therefore direct their treatment to excision of the cyst wall, carefully closing any bronchial opening into the base of the cyst and sacrificing only that lung parenchyma adjacent to the cyst wall. Immediate re-expansion of the lung is obtained by temporary suction drainage post-operatively. The involved lobe or lung was not removed in any of their 5 cases. *E. F. Chin.*

**Pneumoperitoneum in the Differential Diagnosis of Diaphragmatic Hernia.** CLAY, R. C., and HANLON, C. R. (1951). *J. thorac. Surg.*, **21**, 57.

Although rare fatalities have occurred, mostly due to air embolism and resulting from faulty technique, diagnostic pneumoperitoneum, which was introduced in 1919, can be regarded as a safe procedure and even suitable for out-patients. It may sometimes make unnecessary an exploratory thoracotomy, and is particularly valuable for distinguishing lesions below the diaphragm from those above, for recognizing diaphragmatic herniae, and for diagnosing eventration of the diaphragm.

A technique for induction is given and 4 cases are described in detail. In each case a radiograph of the chest was thought to show a tumour or cyst of lung or mediastinum. In 3 symptomless cases the lesion was shown by radiography after pneumoperitoneum to be a diaphragmatic hernia or localized thinning and bulging, but with a broad neck and not containing stomach or gut, so no treatment was advised.

The fourth patient had pain in the shoulder. *X*-ray examination showed a rounded shadow lying posteriorly at the right base, with shift of the mediastinum to the right. After pneumoperitoneum some air was present in the lesion, suggesting a hernia with partly adherent contents. At thoracotomy a thin congenital hernial sac was found, containing a boss of liver, part of which arose from the base area. Associated was an anomalous systemic artery to the lung.

*H. Meredith Brown.*

**Adenoma of the Bronchus.** HUIZINGA, E., and IWELMA, J. (1950). *Ann. Oto-laryng.*, **67**, 743.

Adenoma of the bronchus is by no means a rare condition. A series of 17 cases of bronchial adenoma, 2 of cylindroma, and one case of tracheal adenoma are described in this paper, and the origin and treatment of these tumours are dealt with. The tumours occur more often in females below the age of 40. Of the cases described, 11 were in females and 12 of the patients were under 40. The tumours are polypoidal, rich in blood vessels, slow growing, and located mainly in the large bronchi. The initial symptom is haemoptysis, which may be severe. Then follow symptoms due to bronchial stenosis, atelectasis, and bronchiectasis. Bronchoscopy is important in the investigation of these tumours, which have the appearance of a rosy polyp covered over by mucous membrane and adapting itself to the lumen of the bronchus. Biopsy is essential to exclude carcinoma. Metastases have not been seen. Several theories have been propounded as to the origin of these tumours, but the one favoured by the authors is that they arise from the bronchial seromucous glands and are comparable to tumours of the salivary gland (Brook, Jacob, Vos, Leegaard). It is not possible to exclude malignant tendencies, and these tumours are regarded in the same light as tumours of the parotid. Treatment is by removal, by endoscopic methods, or by lobectomy. The authors removed 12 tumours by bronchoscopy and 5 by lobectomy. There was 1 death in the latter group. In every case the age of the patient, the location of the tumour, and the microscopical appearances will determine the line of approach.

*E. D. Dalziel Dickson.*

**Bronchial Asthma Treated by Bilateral Resection of the Vagus. A Report of Six Cases.** CLARKE, C. A. (1951). *Lancet*, **1**, 438.

Six asthmatic patients in whom there was no obvious cause for the attacks, and in whom medical treatment had failed, were chosen for operation. All branches of the vagus nerve going to the posterior pulmonary plexus, as well as the main branch to the anterior plexus, were divided: 3 weeks separated the operation on the two sides. The result of the operation was disappointing. Two patients had an excellent result, one improved only to relapse, and the remainder showed slight improvement only. *A. W. Frankland.*

**The Complications of Stellate and Thoracic Sympathetic Nerve Blocks.** ORKIN, L. R., PAPPER, E. M., and ROVENSTINE, E. A. (1950). *J. thorac. Surg.*, **20**, 911.

A series is reported of 358 nerve blocks on 218 patients, from the Department of Anesthesiology, New York University-Bellevue Medical Center. There were 186 blocks of the stellate ganglion. The posterior approach was employed on 8 occasions with 2 complications, one in relation to spinal analgesia and one from pneumothorax. The antero-lateral approach was employed on 86 occasions with 9 complications: 2 spinal "taps" without analgesia, 3 with analgesia, 3 pneumothoraces, and one acute asthma. There were no complications following adoption of the anterior approach, which was used 13 times: this technique is recommended on account of its freedom from complications. There were no deaths, but those who developed spinal analgesia suffered from severe shock, 2 became unconscious, and in 2 apnoea developed for which artificial respiration was required.

Thoracic sympathetic block was performed on 42 occasions on 36 patients—28 for angina, 8 for aneurysm, and the remainder for other conditions. Alcohol was injected in 29 patients, 8 of whom developed alcoholic neuritis, usually 6 to 8 days afterwards and lasting about 2 weeks; one had a skin bleb, the cause of which was not determined. There were no deaths. A combined stellate-ganglion and thoracic block was carried out on 130 occasions in 75 patients, 52 for angina, 32 for asthma, 11 for causalgia, and the remainder for other conditions, alcohol being used in 50 cases. The complications were pneumothorax, 4 with one death; neuritis, 4; acute asthma, 3 (one death in a moribund patient); drug reaction, 2; analgesia of the ulnar nerve, 1; cord penetration, 1; haemopneumothorax, 1; and aphonia, 1.

Pneumothorax is the most common of the major complications of thoracic sympathetic block. The fatality occurred in a patient with severe bronchial asthma. Alcoholic neuritis is less likely to occur if the needle is correctly placed in front of the somatic nerves so that sympathetic, but not sensory, paralysis is obtained. *S. V. Humphries.*

**PAS and Streptomycin in the Preoperative Treatment of Far Advanced Pulmonary Tuberculosis.** [In English.] CARSTENSEN, B., and ODELBERG, A. (1950). *Acta chir. scand.*, **100**, 476.

An extensive experience of *p*-aminosalicylic acid (PAS) and streptomycin therapy of pulmonary tuberculosis included 54 cases either hopeless or borderline from the surgical point of view. The patients had had an average period of 8½ months in hospital before treatment, during which time the condition had remained stationary or deteriorated. PAS was given in doses of 10 to 15 g. daily for several months, with additional short courses of 1 g. daily of streptomycin for 10 to 20 days. (This mode of administration is thought to avoid toxic reactions and the development of drug resistance.)

As a result, 37 of the 54 cases became suitable for active treatment and were successfully operated upon; 9 were "cured" without further treatment, whilst only 4 remained in the inoperable class. The majority of operations were thoracoplasties performed under local analgesia. There were no deaths and only one case of spread of disease; of 32 cases adequately followed up 25 had closed cavities.

The authors emphasize the value of prolonged treatment with PAS and streptomycin in rendering the relatively hopeless case fit for successful surgical treatment. They consider that maximum benefit from the treatment is achieved in 5 to 6 months; prolongation beyond this is unlikely to be of further benefit. *W. P. Cleland.*

**Physical Therapy in Operations on the Thorax.** INGVARSSON, M. (1950). *Nord. Med.*, **44**, 1862.

Physiotherapy in association with thoracic surgery was first developed in England, where the author spent some time studying the treatment in 1949. The physiotherapist should be

given charge of the patient at least a week before operation to establish mutual confidence and co-operation. The following methods are used: (1) Pre- and post-operative breathing exercises to prevent atelectasis, lessen deformity, and develop the remaining lung capacity to the full. With the former object in view expectoration is encouraged with the help of diaphragmatic breathing, and the development of lung capacity is assisted by breathing against manual resistance, the hands also supporting and protecting the site of operation. (2) Pre- and post-operative exercises to prevent and correct postural defects. This is of particular importance in cases of thoracoplasty for pulmonary tuberculosis, for the patient has frequently spent long periods in bed. (3) Shoulder exercises to combat limitation of movement in that joint. Graduated active exercises start on the third post-operative day, full range of movement being reached in 10 to 14 days. (4) Postural treatment to encourage drainage. Position varies with the lobe affected, and drainage is encouraged by vibrations and gentle percussion of the chest wall. *J. W. S. Lindahl.*

**Intracavitary Suction (Monaldi) in the Treatment of Emphysematous Bullae and Blebs.** HEAD, J. R., and AVERY, E. E. (1949). *J. thorac. Surg.*, **18**, 761.

Blebs and bullae are defined as localized air pockets in the lung; the former are located immediately beneath the pleura and the latter within the lung substance itself. Both are intimately associated with emphysema of the lungs, of which five main groups are recognized: (1) hypertrophic or chronic obstructive; (2) atrophic or senile; (3) acute vesicular associated with acute infections of the respiratory tract; (4) localized or compensatory; (5) surgical or acute interstitial, asscciated with chest injuries or artificial pneumothorax.

The pathogenesis of emphysematous bullae is ill understood, although it appears probable that many factors are operating. Infective swelling of the bronchial wall, partial obstruction by secretions, actual necrosis and rupture of bronchioles, and spasm of the bronchi may all play their part in association with an expiratory effort relatively passive compared with the forces of inspiration. Trapping of air and consequent distension of the involved tissues appear to play a vital part.

Emphysematous bullae and blebs are often multiple, bilateral, and progressive. A minority of the patients are symptom-free, but most have the symptoms referable to chronic bronchitis or asthma. Infection in the bullae is rarer than in true lung cysts. Embarrassment of the lesser circulation occurs with the changes associated with cor pulmonale. The most frequent additional complication, and often a very grave one, is the occurrence of a spontaneous pneumothorax. In the radiograph annular shadows with fine hair-like borders are seen; the area is relatively translucent, and fine hair-like strands of lung tissue can be made out traversing the spaces. Films taken in varying degrees of obliquity may be necessary to demonstrate the bullae. The lesions may be confused with lung cysts, cystic bronchiectasis, residual cysts following suppuration, tuberculous cavities, and spontaneous pneumothorax.

Various forms of treatment have been employed in the past with varying success. The symptoms are often disabling and progressive, and a fatal outcome is usual unless successful treatment can be instituted. Aspiration is dangerous owing to the risk of traumatic pneumothorax. Local excision or lobectomy is possible only if lesions are strictly localized. Temporary or permanent drainage, direct attempts to close the draining bronchi, and the use of irritant or sclerosing fluids have not given very encouraging results.

The authors report eight cases in which temporary intracavitary (Monaldi) drainage has been used with good results. Adhesions are first produced between the lung and chest wall by gauze packing. After removal of the pack and when the wound is healed a trocar and cannula is inserted into the bulla, the latter is inspected, and a biopsy specimen obtained if possible. A Monaldi catheter is left in the bulla and connected to a water-seal bottle. Suction drainage may be instituted after a few days if re-expansion is not adequate. Infection is controlled by giving antibiotics. Drainage is maintained for two to three weeks until expansion is satisfactory. The results in the eight cases recorded (clinical features are given in detail with illustrative radiographs) have been very encouraging, with marked symptomatic improvement and increase in the vital capacity.

*W. P. Cleland.*

**Bronchial Obstruction.** JACKSON, C. (1950). *Dis. Chest,* **17**, 125.

The author discusses, from the wealth of his experience, the whole range of diagnostic and therapeutic uses of the bronchoscope. Bronchial obstruction may occur at any age, from intrauterine life with the aspiration of meconium, to the terminal phases of life when a patient drowns in the accumulation of his own secretions. It occurs as the result of infections or the ill-considered administration of opiates, in the course of operative procedures, and post-operatively. It may be the manifestation of an exogenous foreign body, of benign or malignant tumour, of some allergic state, or of muscular paralysis.

Two types of common mechanical valve effects in the bronchi are described, as well as an expansile "check-valve," which is said to have no counterpart in engineering. The natural mechanisms for clearing a bronchial obstruction are ciliary wafting, tussive squeeze, and bechic blast, and when these fail bronchoscopic aspiration and manipulation should supplement their efforts. Aspiration is life-saving in any case in which the patient threatens to drown in his own secretions, whether these accumulate neonatally, or from rupture of a large abscess, or in major pulmonary haemorrhage. Regular synergic aspiration forms the basis for a conservative regimen in the treatment of bronchiectasis, and even serves as prophylaxis against its development following unresolved pneumonia.

Bronchoscopic examination provides opportunity for diagnosis of tuberculous tracheobronchitis and observation of the effect of treatment. Localization and biopsy study of intrabronchial tumours are essential before treatment can be planned.

*J. Robertson Sinton.*

**Broncholithiases.** SCHMIDT, H. W., CLAGETT, O. T., and MCDONALD, J. R. (1950). *J. thorac. Surg.*, **19**, 226.

After a review of the history and literature of broncholithiasis from the time of Aristotle, the authors discuss 41 cases treated at the Mayo Clinic. Of the patients 71% were between 40 and 59 years old, all had long histories of cough, and 35 (85%) had had haemoptyses. Pain, either pleural or retrosternal, was present in 23 (56%); 15 had previously coughed up stones. Radiographs revealed a variety of lesions—atelectasis in six, pulmonary abscess in five, spreading hilar flares suggestive of carcinoma in six, and calcified lymph nodes in seven. The most typical appearance was a wedge of collapsed lung with a calcified mass at its apex. No tubercle bacilli were present in the sputa. On six of the patients who had previously coughed up stones bronchoscopy was not performed; of the other 35 who underwent bronchoscopy the examination in 32 gave positive findings, and in 17 (48%) the broncholith was either found and removed or coughed up later. In 10 the involved bronchus was stenotic or obstructed by granulations. Biopsy examination was always performed on the latter to exclude neoplasm, and to clear the way to the buried stone. When carcinoma cannot be excluded, thoracotomy with pulmonary excision if necessary must be performed. The two common sources of broncholiths are calcified hilar lymph nodes, which ulcerate into the bronchus, and ossified areas in the bronchial cartilages, which may sequestrate into the lumen. Of the two the former is undoubtedly commoner. *Geoffrey Flavell.*

**Experimental Studies on the Surgical Treatment of Mitral Stenosis.** BIOCCA, P. (1949). *Policlinico, sez. prat.*, **56**, 1277.

In place of direct attack upon the valve, construction of an atrio-ventricular by-pass is suggested as a means of relieving mitral stenosis. Experiments on dogs are described in which the auricle of the left atrium was anastomosed to the left ventricle. The technique employed was as follows: the lower border of the auricle was first attached by stitches to the ventricular wall. Then a clamp was applied to the auricle and an opening made into it, a corresponding opening being made in the left ventricle. To control the torrential haemorrhage, a temporary clamp was placed on the pulmonary artery. The tip of the auricle was then introduced into the ventricle and the anastomosis rapidly completed.

This operation was performed on 14 dogs, which were killed after varying intervals. In five the communication was found to be closed completely, and in four others the lumen was narrowed down to a mere slit. Only in five was the new opening considered to be large enough to be of any therapeutic value. In view of these inconstant results, the anastomosis was carried out in a further six dogs by means of a free graft from the inferior vena cava, with good results.

*Tom Rowntree.*