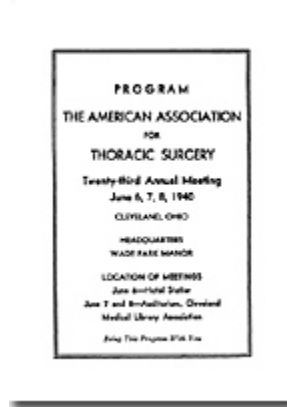


1940 ANNUAL MEETING PROGRAM



Thursday Morning, June 6, 1940

HOTEL STATLER

Joint Session

American Association for Thoracic Surgery
and
National Tuberculosis Association

DR. J. BURNS AMBERSON, Presiding,
President, American Trudeau Society.

9:30 a. m. Scientific Session.

1. Forms of Pulmonary Insufficiency Associated with Collapse Therapy.

ANDRE COURNAND, D. W. RICHARDS, JR., and
HERBERT C. MAIER, New York.

Abst. In patients with physical disability due to disease of the lungs or restriction of breathing apparatus, three general forms of insufficiency can be recognized: (1) Failure of pulmonary ventilation leading primarily to dyspnea (ventilatory insufficiency). (2) Failure of respiratory gas exchange leading to anoxemia and cyanosis (respiratory insufficiency). (3) Combined failure of ventilo-respiratory and of cardio-circulatory mechanisms, with variable symptomatology. By direct and relatively simple measurements, it is often possible to recognize and differentiate these forms of insufficiency. Two cases are presented, which illustrate different aspects of ventilatory, respiratory, and circulatory insufficiency associated with collapse therapy.

The first case demonstrates the following: (1) the extreme degree of emphysema that may develop in young subjects with chronic pulmonary tuberculosis. (2) The small margin of safety that exists in these cases when treated with pneumothorax. (3) The development of profound arterial anoxemia without accompanying increase in dyspnea. (4) The insidious and variable symptomatology associated with anoxemia. (5) The effect of anoxemia in precipitating cardiac failure. In the second case the points of chief interest are: (1) Marked kyphoscoliosis developing in a young subject following extensive thoracoplasty. (2) Physical dysfunction caused by disturbance in mechanics of breathing. (3) Minimal evidence of ventilatory and respiratory insufficiency when the patient was examined under resting conditions. (4) Extreme degree of both ventilatory and respiratory insufficiency during even light exertion, due primarily to failure of the ventilatory mechanism of the chest. (5) Insignificant evidence of cardio-circulatory failure in this case. Detailed measurements of pulmonary and circulatory functions in each case are presented and discussed.

2. Empyema and Unexpanded Lung Problems in Pneumothorax.

E. P. EGLIE, R. H. WYLIE (*by invitation*), and

ADRIAN V. S. LAMBERT, New York City.

Abst. Discussion of the series of empyemas in the course of pneumothorax met with at Bellevue Hospital and in the Bellevue Clinic during the past five or ten years. An attempt has been made to find out what percentage of pneumothorax cases develop empyema, tuberculous and mixed, and also what percentage are left with an un-expanded lung, and then for which of the above purposes thoracoplasty has been done. There will then be given a brief description of this group of patients, their mortality, the risks, and the complicated surgical problems. The total series will be quite large for the entire group, numbering about 500.

Discussion to be opened by B. NOLAND CARTER,
Cincinnati, Ohio.

3. Hospital Mortality and Life Expectancy of Two Groups of Patients Treated With and Without Collapse Therapy.

B. P. POTTER, Jersey City, N. J.

Abst. The author proposes to show the effect of sanatorium treatment supplemented by collapse therapy upon the total hospital death rate and the death rate per new admission, by comparing 1,458 patients treated during the period between 1926 and 1932 when 6.2 received collapse therapy, with 1,619 patients treated in the interval between 1932 and 1938 when 61.2 of the admissions were subjected to one or a combination of the procedures of pneumothorax, phrenic interruption and thoracoplasty. The cases in both groups are divided into three classes: (1) infiltrative and small cavity group; (2) collapse group; (3) group representing such extensive disease as to prohibit any active therapy. The criteria for therapy are as follows: The infiltrative form of pulmonary tuberculosis with negative sputum is treated by the usual rest regimen, unless cavitation or progression takes place during treatment. When, however, a patient presents infiltration, a positive sputum and disputed evidence of cavitation, he is placed in the small cavity group (2 cms. or less) in which, with few exceptions, collapse therapy is favored only after a liberal period of bedrest. Where the cavity is larger, collapse in one of its forms is immediately resorted to unless there are contraindications. The patients in both groups are comparable as to age and extent of disease. The fate of 992 patients subjected to collapse therapy in the period between 1932 and 1938 is demonstrated by comparing conditions of the patients, particularly with respect to the number of deaths, in those, in whom an effective collapse was obtained as against the patients in whom this was not possible. These figures are used as a basis for evaluating the status of the patient in the group treated between 1926 and 1932. The comparison of the total annual deaths and death rate per new admission in the two periods indicate a definite reduction in the total and per new admission death rate in the later years. It is furthermore argued, that to show a favorable effect of collapse therapy on mortality rate, hospital reports are more accurate and deaths of new admissions and not total deaths per new admission should be the yardstick.

4. Standards and Criteria in Artificial Pneumothorax Therapy.

R. G. BLOCK, W. B. TUCKER (*by invitation*), and
W. E. ADAMS, Chicago, Illinois.

Abst. In this paper an attempt is made to isolate various standards and criteria to be applied before and during artificial pneumothorax treatment, but especially in judging the final results achieved by it in phthisic-therapy.

1. A review of the pathological forms, distribution of pulmonary lesions, and the symptomatic pictures is offered, in connection with the question of indication. Special reference is made to the problem of simultaneous bilateral pneumothorax.
2. During the treatment the reactions of the pleural membranes are the dominating factor. The significance, for the outcome of treatment, of adhesions, lability of the mediastinal structures, pleural effusion and empyema is discussed. The skilful application of air-collapse alone yields no satisfactory results. The demand for the combination of artificial pneumothorax with carefully supervised rest treatment has to be upheld as of paramount importance.
3. The manner in which the overwhelming number of reports on results of artificial pneumothorax treatment have been made in the literature is largely responsible for an overenthusiasm as to its possibilities in curing tuberculosis. Few reports are based on the cognizance of the fact that a successful treatment means:
 - a. Restoration of the lung to its physiologic function, i.e., complete re-expansion;
 - b. Adequate roentgenologic evidence of healing of the tuberculous involvement, especially of the disappearance of cavities;
 - c. Return of the patient to normal life; with
 - d. Persistent absence of tubercle bacilli in the sputum;

- e. Persistent absence of all symptoms of activity; and
- f. Complete disappearance of all extrapulmonary complications.

Only after at least two years of satisfactory application of these criteria should a patient be considered as cured by the treatment.

A distinct line is to be drawn between such final results and initial symptomatic improvement, which is frequent and striking but also often misleading as to the ultimate outcome. The application of stricter standards in judging final results tends to reduce the percentage of "cures" considerably, and has made us more modest in our expectations of the treatment.

We offer a report of our own results to which the above standards and criteria have been applied.

Discussion to be opened by JEROME R. HEAD,
Chicago, Illinois.

Thursday Afternoon, June 6, 1940

HOTEL STATLER

Joint Session Concluded.

DR. ADRIAN V. S. LAMBERT, Presiding,
President, American Association for Thoracic Surgery.

2:00 p. m. Scientific Session.

5. The Pathology of Cavity Healing.

OSCAR AUERBACH and HENRY GREEN, Staten Island.

Abst. The true incidence of healed tuberculous cavities is difficult to establish on anatomic grounds at a tuberculosis institution. The vast majority of cases which do come to necropsy at Sea View Hospital are those in which there is a progressive pulmonary tuberculosis with a total duration of less than two years. Therefore the present study, based as it is essentially on postmortem material, is qualitative and directed at the methods of cavity healing, rather than quantitative in the sense of establishing a frequency of healing.

Criteria and Material: There are two sources from which our material could come: (1) those cases in which the cavities undergo healing and death occurs as a result of the complications of chronic pulmonary tuberculosis as amyloid uremia, mixed infection empyema or some cause other than tuberculosis, and (2) those cases in which the tuberculous cavity has undergone healing in one lobe and a progressive tuberculous process is present in the remaining lung parenchyma with resultant death. The latter cases were not included in this report. The only cases included in this study were those where: (1) the sputum examination had initially shown acid-fast bacilli until sputum conversion occurred, after which the sputum examination was persistently negative, and (2) where complete serial X-ray study of the cavity or cavities was available.

We found that healing of the tuberculous cavity occurred in one of two ways: (1) the lumen of the cavity is obliterated-"closed" healing, and (2) the lumen of the cavity remains patent-"open" healing. *Healing by Obliteration of the Cavity Lumen:* This type of cavity healing results either in the replacement of the cavity by a scar or in the retention and inspissation of caseated material within the cavity thus filling and obliterating its lumen.

Healing with an Open Cavity Lumen-"Open Healing": The healing of such cavities may occur in the presence of draining bronchi which opens widely into the lumen of the cavity. There are two components to this form of healing: one is the complete shedding of the inner zone of caseation. This manifests itself clinically by the disappearance of tubercle bacilli from the sputum. The other component, which probably goes on simultaneously with the first, is the transformation of the tuberculous granulation tissue of the cavity wall into a non-specific fibrous tissue.

Microscopically there is a gradual transformation of the wall into fibrous tissue at the expense of the specific tuberculous elements. In the case observed there was extensive but not complete epithelialization of the inner wall of the cavities. The epithelium varied from columnar to squamous in character and arose from the draining bronchi.

6a. Intracavitation Studies in Tuberculosis.

HAROLD BRUNN, SIDNEY SHIPMAN and ALFRED GOLDMAN (*by invitation*),
San Francisco, California.

Abst. Pressure studies, examinations with the cavernoscope and also bacteriological studies of cavities as well as bronchoscopies to determine the character of the bronchi have been made. The conclusions from

these studies cannot be fully drawn, but it is felt the method of study is worthwhile presenting. This work follows somewhat the method of Monaldi in Italy, but more careful studies of the process have been made and some few conclusions drawn.

6b. Further Experiences with Blocked Cavities, in Pulmonary Tuberculosis.

LEO ELOESSER, San Francisco, California.

Abst. Attempts at making a clinical diagnosis of the cause of cavitation in various kinds of tuberculous cavities will be discussed. These include manometric measurements made by needling the cavity, the effect of pneumothorax on cavities, the effect of inspiration and expiration and various postures on the shape and size of the cavity as seen in the X-ray. Experiences with attempts at a cure by needling, aspiration and applying permanent suction drainage will be discussed. A few autopsy experiments will be presented.

Discussion to be opened by Louis R. DAVIDSON,
New York City.

7. Suction Aspiration of Tuberculous Cavities (The Monaldi Procedure).

EDWARD KUPKA and EDWIN BENNETT,
Olive View, California.

Abst. The idea of direct surgical approach to tuberculous cavities has interested medical men since the seventeenth century. Open surgical drainage has been repeatedly revived only to be abandoned again. Closed cavity drainage, a very recent development, was limited to needling in connection with cavity research until its elevation by Monaldi into an important therapeutic measure. Beginning his work in the spring of 1938, Monaldi introduced safeguards into the procedure of transthoracic cavity puncture, and was the first to employ continuous or intermittent suction over a prolonged period through a catheter draining the cavity.

Mechanical causes play a large role in the formation of tuberculous cavities. Suction exerted at the center of a cavity may correct the mechanical factor, if disease changes in the parenchyma about the cavity have not progressed too far. The suction acts in several ways:

1. Initially, drainage of cavity contents such as pus, blood, detritus and bacilli.
2. Re-expansion of surrounding atelectasis.
3. Reaeration of surrounding areas of exudative infiltration.
4. Compensatory expansion (emphysema) of normal pulmonary tissue within a contiguous area.
5. Finally, holding of cavity walls in close apposition until symphysis takes place.

An open or potentially open pneumothorax space is an absolute contraindication to cavity puncture because of the danger of empyema. To seal the pleural surfaces together, single or repeated injections of the patient's own blood into the pleural space, until repeated pneumo attempts over the area to be punctured with the trocar fail to elicit manometer fluctuations.

A special Y-shaped trocar-cannula, which permits a closed air system connected with a manometer during puncture, and subsequent introduction of the catheter, has been devised. More or less intermittent suction is obtained by a simple two-bottle water pump. An interposed trap catches the secretions. Treatment is continued until the cavity is closed and the catheter spontaneously extrudes, with an upper limit of four to six months.

Success of the procedure depends not only upon the character of the cavity wall but also upon the degree of occlusion of the draining bronchus. The less fibrosis and caseation in the cavity wall, and the greater the degree of bronchial occlusion, the better the chance of cavity closure.

Isolated balloon type cavities between three and eight centimeters in diameter lying in the subclavicular area, with little surrounding parenchymal involvement, offer the most favorable indication. The procedure can be carried out in the presence of contralateral disease or collapse, low vital capacity, and poor general condition. It may be considered as preparatory to thoracoplasty, since cavities may reduce in size, sputum becomes negative, and general condition improve to a point where the major procedure can be done.

Among complications, pyogenic skin infection is frequent but not serious. Hemoptysis at time of puncture is uncommon and slight. Cerebral air embolism is theoretically possible but has as yet not been recorded.

In addition to Monaldi's large series of over 200 cases at the Forlanini Institute at Rome, of which 100 have been reported, Weber of Wilhernina Hospital at Vienna has reported 57 cases. The best documented series is that of six cases of Grass of Berlin. To date these are the only ones to have been published in the world literature, although the procedure is being done in many countries. Because of an insufficient post-operative interval, the ultimate results cannot be evaluated as yet. The Olive View series of 25 cases was begun in September, 1939, and the majority of the cases are still under suction. The results to date are given.

8. Treatment of Fungus Infections of the Lung.

DAVID T. SMITH, Durham, North Carolina.

Abst. Many of the pathogenic fungi produce diseases in man which have a higher mortality than tuberculosis.

The more common pathogenic species are *Actinomyces bovis*, *Actinomyces asteroides*, *Actinomyces gypsoides*, *Actinomyces madurae*, *Aspergillus fumigatus*, *Cryptococcus hominis*, *Monilia albicans*, *Blastomyces derma-titidis*, *Coccidioides immitis*, *Histoplasma capsulatum*, *Sporotrichum Schencki*, *Hor-modendrum Pedrosoi*, *Hor-modendrum compactum*, *Phialophora verrucosa* and *Monosporium apiospermum*.

All of the fungi except the *Actinomyces* grow readily on dextrose agar or Sabouraud's media. *Actinomyces bovis* is anaerobic and should be planted on ascitic agar or blood agar and incubated under anaerobic conditions. Potassium iodide orally, sodium iodide by intravenous injections, or ethyl iodide by inhalation is commonly used for treatment. Gentian violet in doses of 5 mg. per kilogram is effective in some types of pulmonary infection with *Monilia*. Colloidal copper or antimony and potassium tartrate may be used for coccidioidal granu-loma. Sulfanilamide has proven of value in the treatment of actinomycosis.

Many patients with fungus infections become hypersensitive to the products of the infecting organism. The administration of potassium iodide to these hypersensitive patients often results in an exacerbation of the infection. Hypersensitive patients should be actively desensitized with vaccine or extracts before the administration of potassium iodide or other chemical agents.

Discussion to be opened by OWEN WANGENSTEEN,
Minneapolis, Minn.

5:00 p. m. A Moving Picture Film Employed for Presentation of Collapse Therapy.

FRASER B. GURD, ARTHUR VINEBERG and
F. DOUGLAS ACKMAN (*by invitation*), Montreal, Canada.

6:00 p. m. Cocktail Party-Wade Park Manor.

Friday Morning, June 7, 1940

AUDITORIUM
MEDICAL LIBRARY ASSOCIATION

9:00 a. m. Business Session.

9:30 a. m. Scientific Session.

1. Extrapleural Pneumonolysis.

E. C. JANES and (*by invitation*) D. B. AITCHISON,
and A. FORSBERG, Hamilton, Ont., Canada.

Abst. The paper deals with the operative technique, postoperative care, complications and end results as computed from a study of seventy cases performed at the Mountain Sanatorium since November 17, 1937. The subject is introduced by a short historical note, with references. This is followed by a description of the operative technique and the after-care employed. Special reference is made to our use of a Carrol-Dakin preparation, because of unfortunate complications in some of our first cases. These included clotting with subsequent obliteration and secondary infection. The instillation of this mild antiseptic solution before closure and its postoperative manipulation is dealt with, as well as other measures to insure an adequate and efficient collapse. One reoperation and one case of bilateral extrapleural collapse is mentioned. The use of oleothorax in maintaining a permanent collapse is also discussed. Complications and their method of control are reviewed. These include, secondary infection, tuberculous empyema, bloody effusion, bronchial fistula, surgical emphysema, perforation of an unsuspected partial pleural space, con-tralateral spontaneous intrapleural pneumothorax, the tendency to obliteration of the space, cerebral embolism and right heart failure. The indications are listed including certain advantages in picked cases over pre-existing choices of treatment. Its use to prepare a very ill patient for more drastic surgery is pointed out. Contraindications are listed with a short reference to the use of planigraph x-rays in the selection of cases.

A table of results is included, which reveals a gratifying-percentage of cavity closures. Illustrative diagrams and x-ray reductions are also included.

2. Extrapleural Pneumonolysis in Artificial Pneu-mothorax. A report of twenty-eight cases.

JOHN S. HARTER and ALLEN A. LILIENTHAL
(*by invitation*), Sanatorium, Mississippi.

Abst. The paper reports on twenty-eight cases of tuberculosis on whom pneumothorax was started. The pneumo-thoraces were not effective due to adhesions, the adhesions being of a type that could not be severed by the closed method or the open method of pneumonolysis, in most cases because of symphysis of the pleura. The first of these was operated on in February 1939. Twenty-six of the patients had bilateral disease. The operation consists of a parascapular incision, a portion of one rib being removed, the rib selected being in closest proximity to the adhesions. The parietal pleura is separated from the chest wall in the region of the adhesion and the pleura opened and cut around so as to leave parietal pleura attached to the free adhesion. The removal of the pleura around the adhesion transforms a small extrapleural pneumothorax into a complete intrapleural pneumothorax, of course leaving an area of the chest wall denuded of parietal pleura. The anaesthesia used was ether induced with cyclopropane. The operation has been successful in twenty-seven cases in obtaining an effective pneumothorax. In spite of the fact that in half of these cases the procedure was carried out as a last resort in saving the patient, only one has died. In our opinion the operation is useful in obtaining an effective pneumothorax in a small group of patients with ineffective pneumothorax, due to adhesions that cannot be severed by the usual methods and who either do not need thoracoplasty or are too sick to consider for thoracoplasty.

Discussion to be opened by E. J. O'BRIEN,
Detroit, Michigan.

3. Bronchospirography.

(1) A new bronchospirographic catheter and the technique of intubation.

WILLIAM A. ZAVOD (*by invitation*), New York City.

Abst. A double-channeled rubber catheter for intrabronchial intubation is described. When properly intubated, it permits accurate measurement of the respired air, gaseous analysis of the expired air and thus the physiological and pathologico-physiological function of each lung separately. The technique for intubation is given in detail and the causes of failure are discussed. The contraindications to bronchspirometry are listed. The technical experience gained in over sixty intubations is analysed.

(2) Application to Collapse Therapy.

GEORGE LEINER (*by imitation*), MAX PINNER and
WILLIAM A. ZAVOD (*by invitation*), New York City

Abst. With the aid of Dr. Zavod's soft-rubber bronchial catheter, bronchospirographic observations were made on patients with pulmonary tuberculosis. One group was examined only once in an effort to gain additional information for indication and contraindication for collapse therapy.

In another group the studies were done before and after collapse therapy, in order to show the functional changes caused by certain forms of collapse therapy.

It seems particularly important to point out that neither clinical nor roentgenological findings are reliable indices of the functional capacity of the lung and that broncho-spirographic records sometimes confirm, but frequently correct the impression gained by other methods of observation. Bronchospirographic observations add significant data to the mechanism of compensation following pulmonary collapse.

Discussion to be opened by SAMUEL O. FREEDLANDER,
Cleveland, Ohio.

4. Rest and Collapse in Pulmonary Tuberculosis.

DAVID SALKIN and A. V. CADDEN (*by invitation*),
Hopemont, West Virginia.

Abst. A. Proposed New Classification of Pulmonary Tuberculosis

(1) On admission

(2) On discharge

Discussion of the faults of the present N.T.A. classification and the need for a more thorough one.

B. Using the proposed system, 3204 cases have been studied very thoroughly to evaluate three different programs of therapy.

(1) Mild activity program-556 cases

(2) Strict bed rest program-886 cases

- (3) Collapse therapy program-1762 cases Discussion of the selection of the material, analysis of each type of therapy, use of strict bed rest as a standard by which to measure other treatments, inferred newer indications and contraindications.

Discussion to be opened by EMIL BOGEN (*by invitation*),
Olive View, California, and JOHN N. HAYES,
Saranac Lake, N. Y.

1:15 p. m. Luncheon-University Hospital
(Harvey House Dining Room)

Friday Afternoon Session June 7, 1940

AUDITORIUM
MEDICAL LIBRARY ASSOCIATION

2:00 p. m. Executive Session.

3 :00 p. m. Presidential Address.

ADRIAN V. S. LAMBERT, New York City.

6. Angina Pectoris.

PETER HEINBECKER, St. Louis, Missouri.

Abst. The presentation will cover a general review of our knowledge of the mechanism of painful sensations and in particular those arising in the heart. Much of the evidence to be presented has been derived from the results of original investigations. An evaluation of some of the surgical procedures advocated for relief from angina pectoris will be made.

Discussion to be opened by CLAUDE S. BECK,
Cleveland, Ohio.

7. The Surgical Treatment of Patent Ductus Arteriosus Complicated by Subacute Bacterial Endocarditis.

ARTHUR S. W. TOUROFF, New York City.

Abst. Four cases of patent ductus arteriosus complicated by subacute bacterial endocarditis have been subjected to operation. The first patient has been free from all evidence of the original lesions for more than three months. Two died from hemorrhage, and the fourth has been improved. A discussion of the problem will be given.

Discussion to be opened by JOHN W. STRIEDER,
Boston, Mass.

Exhibits, Films, Demonstrations:

8. A Mechanism for Intermittent Pulmonary Insufflation in Thoracic Surgery.

FREDERICK R. MAUTZ, Cleveland, Ohio.

9. Exhibit of experimental work on the heart.

CLAUDE S. BECK, Cleveland, Ohio.

10. Cine-roentgenographic Studies of the Pulmonary Circulation, the Chambers of the Heart, and the Greater Blood Vessels, in Health and Disease.

W. H. STEWART, H. C. MAIER, C. W. BREIMER
(*by invitation*), New York City.

8:00 p. m. Annual Dinner-Wade Park Manor.

Saturday Morning Session, June 8, 1940

AUDITORIUM
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9:00 a. m. Scientific Session.

11. Individual Ligation Technique for Lower Lobe Lobectomy.

BRIAN BLADES, St. Louis, Missouri.

Abst. A technique involving separate ligation of each anatomical structure in the hilum of the lobe is recommended for lower lobe lobectomy.

The method is based on investigations of the surgical anatomy of the lower lobes and experiences with ten successful cases in which the procedure was employed. Important anatomical anomalies which influence the surgical technique are discussed.

A lower incidence of bronchial insufficiency and associated putrid empyemata are considered the principal advantage of the operation.

The question of the immediate hazard of the method as compared to mass ligation of the lobar hilum cannot be answered without further experience.

Discussion to be opened by JOHN B. FLICK,
Philadelphia, Pa.

12. Aseptic Pleural Adhesions Experimentally Produced.

J. J. SINGER, JOHN C. JONES and L. J. TRAGERMAN (*by invitation*),
Los Angeles, California.

Abst. Thirty-nine rabbits were injected into the pleura with the following sterile materials:

- (1) Poudragewith (a) iodized talc.
 - (b) thymol iodide powder
 - (c) bismuth formic iodide powder
- (2) Iodized talc (magnesium silicate) in normal saline
- (3) Talc only in normal saline.
- (4) Thymol iodide in (a) normal saline
 - (b) cottonseed oil
- (5) Gomenol in cottonseed oil
- (6) Bismuth formic iodide powder in normal saline
- (7) Sodium morrhuate
- (8) Theridol
- (9) Graphite in normal saline
- (10) Normal saline only
- (11) Peptone broth only

Successful production of aseptic adhesions occurred in a majority of instances, particularly with iodized talc in saline. No adhesions were found when beef broth or normal saline solution were injected. The adhesions produced were particularly effective in the fixation of the mediastinum which represents the most vulnerable area of infection following lobectomy. The adhesions responsible for mediastinal fixation were usually band-like or diffuse, as were those occurring between the dial phragmatic pleura and the base of the lung. Adhesions occurring laterally between the visceral and parietal pleura were generally fine and string-like. Gross thickening of the pleura was rarely seen.

Many operations on the rabbit have been performed. These include lobectomy, ligation of hilum of lobe of lung, freeing the lung from adhesions, ligation of the pulmonary artery and exploratory thoracotomy. It was found that animals that had been injected and the pleura thickened withstood large thoracotomy wounds better than untreated ones. Most of the animals have had pneumothorax done and several thorascopies.

A new method of depositing particulate matter has been developed. This consists of making a suspension of the desired powder in normal saline. Under local anesthesia a pneumothorax is produced under manometric control. 5-10 cc. of the suspension is introduced into the pleural cavity and the animal is rotated in all directions. This permits the distribution of the powder over the entire chest cavity, inasmuch as the saline is rapidly absorbed it leaves the powder spread evenly.

Conclusion:

1. An effective method of producing sterile adhesions has been obtained.

2. Histological studies have been made on the pathway of particulate matter when injected into the pleural cavity and with regard to the mechanism of protection by the procedures employed.
3. The risk of thoracic surgery is reduced by the preliminary treatment of the pleura.

Discussion to be opened by FRANK B. BERRY,
New York, N. Y.

13. Experiences with Lobectomy and Pneumonectomy in Pulmonary Tuberculosis.

FRANK S. DOLLEY and JOHN JONES,
Los Angeles, California.

Abst. Seven cases are to be reviewed: their course and present condition discussed. Indications that, in the authors' opinion, warrant lung removal; complications that have occurred that might have been materially lessened or obviated; and the technique the authors have found most successful will be described.

Discussion to be opened by JOHN ALEXANDER,
Ann Arbor, Michigan.

14. An Experimental Study of the Fate of the Remaining Lung Following Total Pneumonectomy.

J. J. LONGACRE, Cincinnati, Ohio, (*by invitation*),
RALPH JOHANSMAN, Cincinnati, Ohio.

Abst. Hyperplastic regeneration of the remaining lung following total ablation of one lung in young mammals has often been recognized and in a few instances these changes have been contrasted with the dilatation of the definite lobules occurring in adult animals. Physiologic studies have shown that immediately following pneumonectomy, the cardio-respiratory reserve is cut in half as the result of the removal of practically fifty percent of the functional diffusing lung surface area. This is still sufficient for resting conditions and moderate exercise. But as the amount of strain is increased the impairment of the cardio-respiratory reserve becomes increasingly more apparent. On succeeding runs two months later there is a tendency for the animals to show less and less embarrassment, due to compensatory changes. Within nine months to one year when subjected to severe and absolute strain animals (pneumo-nectomized as adults) are found to come back only seventy to eighty percent of the way. Animals pneumo-nectomized as puppies show no impairment whatsoever at the end of this period when compared with their normal control mates. These results indicate that the capacity of the organism for further growth accounts not only for the difference in the anatomic changes, but also for the difference in function.

A second group of dogs (some pneumonectomized as puppies, others pneumonectomized as adult animals) have been followed, studied and then sacrificed at various intervals up to six years (actually more than half their normal life expectancy). Observations were made of the changes in intra-pleural pressure as an index of the integrity of the elastic tissue in the remaining lung. Physiologic studies showing the response of the animal to severe and absolute strain were performed. The animals were then sacrificed at various intervals. The lungs were fixed under constant pressure in Bouins fluid and large microscopic serial sections were then made, so as to include a large portion of the cross-sectional area of the remaining lungs. Small sections were also made and stained with differential stains. The findings noted in these sections were then correlated with the changes noted in the physiologic studies.

Discussion to be opened by CHARLES W. LESTER,
New York, N.Y.

15. The Role of Bronchoscopy in the Treatment of Pulmonary Abscess.

CHEVALIER L. JACKSON and A. R. JUDD (*by invitation*),
Philadelphia, Pa.

Abst. The present study of pulmonary abscess constitutes a review of 137 cases seen in the Chevalier Jackson Bronchoscopic Clinic over a period of ten years. Their collection has been based upon the patients' history, the roentgen and laboratory findings. The data has been analyzed with special reference to etiology, duration of symptoms, bacteriological findings, complications, treatment and results. Special attention was given to the bronchoscopic phase of the treatment with a view to correlating this procedure with the problem as a whole. The authors believe that bronchoscopy affords a definite aid not only in the diagnosis and the combined treatment of pulmonary abscess, but also as the principal method in certain cases. It is emphasized, however, that bronchoscopic and so-called non-surgical treatment should not be carried beyond the optimum time for the employment of some other procedure. This optimum point varies in the different patients, and must therefore be quite individualized, but generally it can be determined by concerted consideration of the various aspects of the case when a patient fails to improve within a reasonable time.

Discussion to be opened by PAUL C. SAMSON,
Oakland, California.

1:15 p. m. Luncheon-University Hospital
(Harvey House Dining Room)

Saturday Afternoon Session, June 8, 1940

AUDITORIUM
MEDICAL LIBRARY ASSOCIATION

2 :00 p. m. Scientific Session.

16. The Differentiation of Bronchiogenic Carcinomas.

PAUL W. GEBAUER, Cleveland, Ohio.

- Abst.* 1. Pathologically and clinically small cell carcinoma, adenocarcinoma and squamous cell carcinoma are three fundamental types of bronchiogenic cancer.
2. The differences of these types early in the course of the disease sometimes permit their distinction by combined clinical, radiologic and bronchoscopic investigations. Late in the disease this is true in approximately 60 percent of cases.
 3. Bronchoscopy will be negative in 40 to 50 percent of cases if performed at the onset of symptoms. When negative, it should be supplemented by other biologic, endoscopic, and radiographic diagnostic methods until the cause for symptoms is known.
 4. The impression that clinical symptoms tend to occur early, when the tumor is in an operable state, has been gained from this study. Therefore, it is felt, that if diagnosis is made early and there is the proper selection of operative material, surgical treatment will gain a respectable position in therapeutics.

Discussion to be opened by W. E. BURNETT,
Philadelphia, Pa.

17. Controversial Points in Anesthesia for Thoracic Surgery.

HENRY K. BEECHER (*by invitation*), Boston, Mass.
(Introduced by EDWARD D. CHURCHILL, Boston, Mass.)

- Abst.* Discussion of the pros and cons of several disputed points such as intratracheal tube versus gas mask differential pressure; noxious versus harmless effects of ether in pulmonary tuberculosis; bronchial occlusion by balloon tipped catheters during anesthesia; rationale of Crafoord's method of rhythmic positive and negative pressure ventilation; relative status of various inhalation anesthetic agents, etc.

Discussion to be opened by HARRY R. DECKER, Pittsburgh, Pa.,
and GUSTAF E. LINDSKOG,
New Haven, Conn.

18. The Operative Treatment of Cardiospasm.

HOWARD K. GRAY and I. C. SKINNER (*by invitation*),
Rochester, Minnesota.

- Abst.* This paper deals with the relatively few cases of cardio-spasm in which operative treatment has been found to be necessary for relief of the condition. In over 1200 cases of cardiospasm seen at the Mayo Clinic operations for the relief of cardiospasm have been performed only seven times. These cases are reported. Mikulicz' operation of manual dilatation of the cardia was performed four times, esophagogastrostomy one time, thorococervi-cal sympathectomy one time, and abdominal sympathectomy combined with manual dilatation of the cardia one time. It is our opinion that in those few cases in which the esophagus is markedly dilated, lengthened and tortuous (sigmoid esophagus) with the development of a reservoir below the opening of the cardia, surgery will at times be found necessary. A brief historical resume of cardiospasm from the original interesting description by Thomas Willis in 1674 until the present time is given with quotations from this early article. The etiology, pathology, symptomatology, diagnosis and non-operative treatment of the disease has been considered in a very brief manner. A discussion of the various operative procedures designed for the relief of cardiospasm includes Mikulicz' procedure, transpleural and transperitoneal esophagogastrostomy, the resection of the sympathetic nerve supply to the cardia, Heller's operation of extramucosal cardioplasty and its modifications, esophagoplication, etc. The technique of abdominal esophagogastrostomy is given in detail with illustrations

Discussion to be opened by EDWARD D. CHURCHILL,
Boston, Mass.

19. The Injection Treatment of Esophageal Varices.

H. J. MOERSCH, Rochester, Minnesota.

Abst. A review of the subject with the report of a case of esophageal varices successfully injected with sclerosing solution through an esophagoscope will be given.

Discussion to be opened by EDWIN J. GRACE,
Brooklyn, N. Y.

20. Surgical Aspects of Carcinoma of the Esophagus.

ALTON OCHSNER, and (*by invitation*), MICHAEL DEBAKEY and SAMUEL MURRAY, New Orleans, La.

Abst. Carcinoma of the esophagus has generally been considered a hopeless condition, and until relatively recently the treatment has been palliative. However, a revival of interest in the subject lately has indicated the feasibility of surgical intervention as a means of curative therapy.

In this presentation the authors have reviewed the world literature on the subject of the surgical approach to esophageal carcinoma. The cases in which a surgical procedure was performed in an attempt to remove the lesion are collected and analyzed. Various procedures that have been advocated are reviewed, diagrammatically illustrated, and discussed from the standpoint of advantages and disadvantages. The most desirable procedures in the authors' opinion, for lesions at various levels in the esophagus are considered and illustrated. Three cases of carcinoma of the esophagus operated upon by the authors are reported. One of these patients in whom the lesion was resected and normal function reestablished lived over one year with no evidence of recurrence.

Discussion to be opened by JOHN H. GARLOCK,
New York City.

21. Esophago-gastrostomy-An Experimental Study.

B. NOLAND CARTER, and (*by invitation*),
JEAN STEVENSON and OSLER A. ABBOTT, Cincinnati, Ohio.

Abst. With the background of clinical experience derived from two successful esophago-gastrostomies performed upon patients suffering from cancer of the esophagus, the problems pertaining to the performance of an ideal esophago-gastrostomy were dealt with in the laboratory. Experiments were carried out on dogs to discover the defects and advantages of various types of anastomoses. Clinically, the chief danger of esophago-gastrostomy is leakage at the line of suture and this is most commonly due to tension. A method to obviate tension on the anastomosis has been devised. This consists in anchoring both the stomach and the esophagus to the periosteum of nearby ribs or vertebral bodies. From a clinical viewpoint an important late complication of the operation is stricture, and this point is emphasized in this experimental work.

Discussion to be opened by W. E. ADAMS,
Chicago, Illinois.

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