

GENERAL STAFF MEETING  
UNIVERSITY HOSPITALS

CONTENTS

PAGE

I. ANNOUNCEMENTS

- 1. TUMOR CONFERENCE ..... 1
- 2. RADIO ..... 1
- 3. INTERNS ..... 1
- 4. DESIRED ..... 1
- 5. STATE BOARD ..... 1
- 6. MORTALITY REPORT - FEBRUARY 1931 ..... 1 - 2

II. CASE REPORTS

- 1. OLD VALVE DEFECT (MITRAL STENOSIS), HYPERTENSION HEART,  
CORONARY SCLEROSIS AND THROMBOSIS (MYOCARDIAL THROMBOSIS),  
ENCEPHALOMALACIA (THROMBOSIS)..... 2 - 4
- 2. BRONCHOGENIC CARCINOMA, CHRONIC EMPYEMA, BENIGN NEPHROMA.... 4 -10

III. ABSTRACTS

PRIMARY BRONCHIAL CARCINOMA (BRONCHIOGENIC CARCINOMA).  
 HISTORICAL, INCIDENCE (INCREASED FREQUENCY) SEX, AGE, OCCUPA-  
 TION, ETIOLOGY, LOCATION, TYPES, REGIONAL EXTENSION,  
 METASTASES, INTRAVITAM DIAGNOSIS, CLINICAL MANIFESTATIONS,  
 ONSET, FREQUENCY, SYMPTOMS (ANALYZED), PHYSICAL FINDINGS,  
 DIFFERENTIAL DIAGNOSIS, PROGNOSIS, X-RAY (DIFFERENTIAL),  
 SUMMARY ..... 10 -17

## I. ANNOUNCEMENTS:

### 1. Tumor Conference.

N. Logan Leven, Carcinoma of the Pancreas, Friday, March 10, at 11 A. M. in Todd Amphitheater.

### 2. Radio

March, 1931 - Wednesday (11 A.M.). March 4 - Rheumatic Child, March 11 - Treatment of Insomnia. March 18 - Cause of Meningitis. March 25 - Cancer of Bladder.

### 3. Interns

Please sign book in person when leaving hospital and when returning. This will avoid mistakes and verify presence of man signed out to.

4. Desired - Early opportunity to study patients with amyloid disease and acute yellow atrophy of liver by Department of Medicine. Very few clinical opportunities to study these diseases earlier in course at the University Hospitals.

5. State Board - Desires name, age, source of material and laboratory examination desired on all materials sent for any other test than Wassermann and Diphtheria cultures (which are filled out by service and laboratory.)

### 6. Mortality report, February 1931

#### I. Malignant

##### A. Examined (9).

Carcinoma of bronchus	45.	M
Carcinoma of cervix	41	F
Carcinoma of kidney	45	M
Carcinoma of lip	68	M
Carcinoma of palate	73	M
Carcinoma of pharynx	74	M
Carcinoma of rectum	66	F
Carcinoma of stomach	69	F
Glioma of infundibulum	45	F

##### B. Not examined (1).

Carcinoma of cervix	30	F
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#### II. Non-Malignant

##### A. Examined (12).

Benign hypertrophy of prostate	78	M
Benign hypertrophy of prostate	70	M
Congenital hypoplasia of thyroid	2 mo.	M
Coronary thrombosis	65	M
Coroner's Case	25	F
Gastric Ulcer	70	M
Hypertension heart	55	M
Leukemia, acute	8 mo.	M
Otitis media (meningitis)	67	M
Osteomyelitis (amyloid)	47	M

Spontaneous cerebral hemorrhage 19 F  
 Still birth 0 M

B. Not examined (3)

Mitral stenosis 41 F  
 Prematurity 6 mo.M  
 Pulmonary tuberculosis 39 F

	<u>Total</u>	<u>Exam.</u>		<u>Total</u>	<u>Exam.</u>
Cancer Gynecology	2	1	Orthopedic Surgery	0	0
Cancer Surgery	7	7			
			Pediatrics	3	2
Gynecology	0	0	Pediatric Surgery	0	0
Health Service	3	3	Stillbirths	1	1
Medicine	4	3	Surgery	<u>4</u>	<u>3</u>
Neurology	1	1	Totals	25	21
Newborn	0	0	Deaths		Examinations

Percentage (84%).

II. CASE REPORTS

1. OLD VALVE DEFECT (MITRAL STENOSIS), HYPERTENSION HEART, CORONARY SCLEROSIS AND THROMBOSIS (MYOCARDIAL THROMBOSIS), ENCEPHALOMALACIA (THROMBOSIS). Path.-Randall

The case is that of a white male 65 years of age, admitted to the University Hospitals 2-4-31 and died 2-18-31 (14 days).

2-3-31 - No history prior to this time obtained. Patient had a stroke of apoplexy today.

2-4-31 - Admitted to the hospital in a stuporous condition, but could be aroused. Did not move left arm or leg. His left eye lid was drooping. B. P. 185/100. His eyegrounds showed marked arterial venous crossings of the hypertensive type. There was no facial expression on the left. His pulse was irregular but not fibrillating. His reflexes on the left side were gone; hyperactive on the right. Left Babinski positive. Neuropsychiatric examination: Patient mainly lethargic. Had involuntary defecation during the examination; Small arteries with irregular light streak. iii, iv and vi nerves - conjugate deviation to right. vii nerve - left sided paralysis of lower division only. xii nerve - midline protrusion. Breathing was somewhat sonorous and with some Cheyne-Stokes' rhythm which was incomplete. There was complete paralysis of the left upper extremity. Moderate paresis of the left lower extremity. No definite sensory disturbance. Conclusion: Patient has evidently had a recent stroke, probably lesion in right internal capsular region. Lumbar puncture: Fluid clear, colorless. Pressure 200, J.P. 300. Cell 0. Nonne - negative. Noguchi negative. Blood Wasserman negative, Larson negative. Colloidal gold negative. Hb. 103%, WBcs 9,250, Pms 60, L 36, M 4. B.U.N. 16.3. Spinal fluid cell count - 0. T 99, P 62. Ice cap to head. Turned from side to side frequently. 1,000 cc. saline in hypodermoclysis. Mouth breathing. Incontinent as to urine and feces.

2-5-31 - X-ray of chest (portable) - Density of left base suggesting large pleural effusion. The possibility of parenchymal pathology must also be considered. haziness of right base, fluid here also. Left heart border considerably enlarged.

Suggested either aortic disease or hypertension. Patient somnolent. Still has conjugate deviation to right. Apparently has a left sided homonomous hemianopsia. Movements in left hand good but weak. Can flex left elbow and can move left lower extremity. Suggestive of lesion in posterior portion of internal capsule on the right. Liquid diet. Swallows only small amount of water at one time. Responds slowly. Not as stuporous, but quite restless. Involuntary urination. Answers questions coherently. 10 P.M. Emesis 200 cc. T 100 (r), P 78.

2-6-31 - Urine negative. Condition unchanged.

2-7-31 - Responds better. Conjugate deviation improved. No other changes.

2-9-31 - Cannot move left arm. T 101 (R). His breathing seems to be more labored. Evidently a case cerebral thrombosis which has not spread to become extensive in the right hemisphere. WBCs 10,500. Auricular fibrillation. Catheterized - only few cc. recovered. More drowsy and stuporous. Incontinent.

3-11-31 - Condition unchanged. T 102.4 (R), P 100. Tongue dry. Jaundiced. Marked ascites. Rales in bases of both lungs. Pitting edema of legs and back. Cyanosis. Emesis 20 cc. Difficulty in breathing.

2-12-31 - T. 102.4, P 90, R 24. Patient is very weak. Responds poorly. Unable to take fluids by mouth.

2-13-31 - Responds better. Restless at times. Taking fluids fairly well. Edema of the eyelids. It is doubted that the patient has ascites and auricular fibrillation.

2-14-31 - Sleeps for long periods. Incontinent.

2-15-31 - T 100.4, P 88, R 24. Patient pulls cover off constantly. Pulse irregular.

2-16-31 - Pulse irregular. Respirations stertorous. Takes fluids well. Responds very little. Decubitus ulcers of buttocks.

2-17-31 - Drowsy. Takes fluids poorly. Rales audible. Hands cold and clammy. T 102-103-105. P 86, R 28-36-52.

2-18-31 - Pulse imperceptible. T 105 (R). Does not respond. Rapid breathing. Cyanosis. Hands cold and clammy. Died 2:40 A.M.

Autopsy - The Heart:

weighs 485 grams. There is a great deal of pericardial fat and some hypertrophy of the left ventricle. In the wall of the left ventricle there is marked fibrosis. An area 2 cm. in diameter lies just underneath the endocardium and has all the appearances of an old infarct. There is another fibrotic area which is quite extensive in another portion of the wall of the left ventricle. The coronary vessels are quite sclerotic throughout with partial occlusion of the left coronary. - The mitral valve is stenotic. There is an area about 2 cm. in diameter on the mitral leaflet which shows an extensive endocardial thickening and ulceration, measuring about 10 mm. in diameter. The root of the aorta shows sclerosis. There is moderate hypertrophy of both ventricles. The corda tendina were thickened and short. There were some plaques on the aortic valve.

The Lungs -

weighs 580 grams right, and 580 grams left. There are small, calcified nodules over the surface of the right lower lobe measuring about 2 mm. in diameter. There is extensive congestion throughout both lungs. The BRONCHI showed marked hemorrhagic bronchitis. There are numerous areas of consolidation in both bases with beginning early infarction present around these pneumonic areas. The pneumonic areas are quite firm cellular, grey, opaque in color. No pus can be expressed, from the alveoli.

The Liver -

weighs 1200 grams. Shows a fine lobulation. On the surface somewhat irregular. On section there is extensive congestion. It is quite firm. The lobulations are distinct. It is essentially a picture a central atrophic cirrhosis. The GALLBLADDER is distended and contains a greenish colored bile. The wall is thickened. There is a small stone about 15 mm. in diameter free in the lumen of the gallbladder. There are several cholesterolin deposits in the wall and on the mucosal surface.

The Right Kidney -

weighs 175 grams, the Left 150 grams. The capsules strip with difficulty. There are coarse and fine lobulations on the surface, somewhat injected. The glomeruli are pale. The cortex and medulla are definitely decreased in thickness. There is a small aberrant vein in the lower pole of the left kidney. The GASTRO-INTESTINAL TRACT is negative. BLADDER is negative.

Head -

the skull and meninges are negative. The brain is somewhat congested. The section shows an area about 2 cm. in diameter of softening in the precentral gyrus just lateral to the lateral ventricle in the right side. There is no evidence of hemorrhage. The cerebral vessels show arteriosclerosis and the vessels in the region of the softening are occlusion of the cerebral vessel on the right. (One is not sure that this is not an embolic process).

DIAGNOSIS:

- |  |   |
|--|---|
| 1. Hypertension heart<br>(hypertrophy of left ventricle)     | 10. General arteriosclerosis.                                     |
| 2. Coronary sclerosis and thrombosis.                        | 11. Arteriosclerosis of kidney.                                   |
| 3. Myocardial fibrosis                                       | 12. Chronic cholecystitis, cholesterosis and cholesterolin stone. |
| 4. Old valve defect (mitral stenosis).                       | 13. Atrophy of spleen (hyaline perisplenitis).                    |
| 5. Hypertrophy of right ventricle.                           | 14. Hemorrhagic bronchitis  |
| 6. Encephalomalacia of right precentral region (thrombosis.) | 15. Decubitus ulcer   |
| 7. Myocardial failure.                                       | 16. Anchor tattoo.  |
| 8. Chronic passive congestion of lungs and liver.            |   |
| 9. Infarcts of lung.   |   |

Comment:

The case is that of an interesting combination of old healed, early infectious process (mitral valve), and development of degenerative arterial changes with secondary infection. Both ventricles were hypertrophied but most of the coronary change was on the left side. There was evidence of old infarction in two different areas (recovery) Encephalomalacia was due either embolic (but no primary source could be determined in the heart) or to thrombosis.

2. BRONCHOGENIC CARCINOMA, CHRONIC EMPYEMA BENIGN, NEPHROMA. Path. Randall

The case is that of a white male age 45 years, admitted to the University Hospitals 12-4-30 and died 2-6-31 (31 days).

2-24-30 - An upper respiratory infection followed by lobar pneumonia. Details not known. Duration 2 weeks. Convalescence very slow. Patient became weak, fever returned and empyema was diagnosed with repeated "taps". Considerable chest pain, dyspnea, Non-productive cough. Fever and chills.

5-26-30 - Taken to the hospital.

6-4-30 - Rib resection followed by considerable drainage.

6-13-30 - Discharged. Drains removed later. Incision healed, and after a week a mass formed. This was incised (abscess).

10-6-30 - 2 ribs resected. Drainage still persists. Dakin's irrigation every day since.

12-4-30 - Pain in chest, Fever, Dyspnea, draining sinus in chest. Past History - Essentially negative, Nocturia. Has had both arms and legs broken at various times. Tonsillectomy 1922. Weight Jan.1,1930 305#(?). 12-4-30 185#. loss of 120# (?). Physical examination - B.P. 122/84.T<sup>99</sup>.2.P.105, R 24, White male in considerable distress. Complains of pain in his chest. He is the foreman of a railroad crew. He is a robust man, but his tissues show considerable loss in weight, Pharynx is injected. Few tonsillar tags, Chest: Increased excursion in right chest and decreased in left. Dullness on left, especially lower lobe. Increased resonance on right. Sinus on left posterior side. Heart negative. Tones clear and regular. Extremities - scattered scars on both lower and upper extremities. Fingers clubbed, nail changes. Impression: Empyema with rib resection.

Laboratory - Urine - occasional WBCs. Hb 85%. WBCs 11,850. PMns 62, L 33, B.2.M.2.

12-6-30 - X-ray of chest - 1. Empyema left with bronchial fistula. 2. Probable lung abscess, left. 3. Unresolved pneumonia, left. Plates of chest were made following injection of the empyema cavity on the left with lipodal. 7th rib resection on left side with catheter in situ. Only a small amount of lipodal is present in empyema cavity. Some lipodal present on the right side indicating communication with bronchus. Considerable hilar density. Right lung field appears quite clear.

Progress: 12-4-30 - General diet. Slight drainage from wound.

12-5-30 - Cough and sharp pains in chest with respiration (pleural type).

12-6-30 - Slept only for short intervals.

12-7-30 - (Patient has broncho-pleural fistula) Was indicated by having very severe coughing spell after Dakin's irrigation to wound. 12:30 Chill, severe which lasted 15 minutes. T 100.4. P 120, R 22. Cod. sulphate gr. 1.

12-8-30 - Dressings changed daily. Considerable drainage. Cough.

12-10-30 - Wound irrigated with normal saline. Coughs some. Expectorates a great deal.

12-11-30 - Morning temperature 99.4, P 68, R 22. Evening T 103.4. P 108. R 22.

This evening rise of temperature in general persisted through his hospital course.

X-ray of chest - Pathology in left chest so extensive quite difficult to make an accurate analysis. Appears to be an encapsulated empyema left posterior and lateral. Conclusion: Extensive involvement of pleura with thickening and encapsulation. Probable multiple lung abscesses, secondary displacement of the esophagus. Irrigate wound with normal saline. t.i.d. Postural drainage b.i.d. Raises considerable sputum. Returns from irrigation slightly bloody.

12-12-30 - Cod. sulphate. Pain. Profuse expectoration. General malaise.

12-13-30 - Hot-water bottle to chest.

12-19-30 - 8:30 A. M. - M.S. gr. 1/3. Bronchoscopic: No pus seen in larynx or trachea. Left main bronchus narrow and impossible to pass 7 mm. tube through. No pus seen coming from below. Bloody granulations at orifice of main bronchus. Do not believe bronchoscopic drainage will help much. 10:15 A. M. Codeine sul. gr. i (M). for cough.

12-21-30 - Postural drainage. Tries patient and no sputum is raised. An. T 98. P 96, R 20. Evening T 101.6, P 80, R 18.

12-22-30 - 8:30 A. M. M.2.gr. 1/4, atropin gr. 1/150. Profuse drainage. To operating room. Anesthesia: Morphine plus nitrous oxide. Vertical incision between serratus anterioria and lateral dorsi. 4th and 5th ribs resected subperiosteally and pleura cut down upon. Pleura thick. Lung adherent to chest wall. Aspiration made into substance of lung and pus obtained. Cut down upon with endetheria. Packed with gauze and vaseline inserted around the area. Operation very difficult for orientation. Patient conscious on return from operating room. P 128, R 20. 3:30 P. M. Hypodermoclysis of normal saline 200 cc. No biopsy taken.

12-23-30 - During the night the patient expectorated phlegm containing dark red blood. Perspires profusely. Dressing changed. Dressing saturated with bloody serous drainage. Pain in chest. Liquid diet. M.S. gr. 1/4. T 100, P 100, R 26.

12-24-30 - 4:30 P. M. M.S. gr. 1/4. Patient having considerable pain. Dressing changed P.R.M.

12-28-30 - soft diet Emesis after lunch of fluid and food taken.

12-29-30 - Packing removed. Probe inserted. X-ray - The whole left hemithorax is filled at least with fluid. The probe extends into the pleural cavity at a point opposite one of the parent abscesses. Outlines of abscesses not plain.

12-30-30 - 2 A. M. Cod. sulphate gr. ss. 3:20 P. M. M. S. gr. 1/4, 9:40 P.M. M.S. gr. 1/4. Patient having considerable pain in chest. Dichloramine T packing to wound.

12-31-30 - Urine shows trace of albumin, many shreds.

1-1-31 - Bathroom privileges. Hb. 72%. Bcs 4,000,000 WBCs 12,050, PMns 72%  
Patient has been unable to sleep due to coughing and pain.

1-2-31 - Drain in chest came out.

1-3-31 - 9 P. M. M. S. gr 1/4. Cough.

1-4-31 - 7 P. M. M. S. gr. 1/4. Cough.

1-5-31 - Amytol gr. iii.

1-6-31 - Patient appears weaker. Pain after eating. The food and fluid taken is coughed back. Seems to go about 1/2 way down the esophagus (obstruction!). Luninal gr. i. Pyramidon gr. x at 7 P.M.

1-7-31 - Coughed a dark clot of blood. Patient weak, with considerable pain. Coughed back luninal tablet after taking it. Urine shows trace of albumin.

1-8-31 - X-ray of chest - Esophagus is displaced somewhat to the right and distinctly compressed. Displaced somewhat anteriorly. The mass projects over the heart shadow which was previously reported, again shown.

1-9-31 - T 100, 105 R 22. Food coughed back but not as much as before.

1-10-31 - Elix. terp. hydrats dr. i.t.i.d. with codeine. Severe pain in chest. Gas pains.

1-11-31 - Slight epistaxis. Still coughs back some fluids and food. Vomits medications.

1-12-31 - Sharp pains now in right chest. Weaker. 101, P 100, R 30.

1-13-31 - Pain right chest aggravated by normal breathing. Auscultation negative. Patient coughing some. T 101.6. P 105, R 22. Impression: Pleurisy.

1-14-31 - Urine: Red and cloudy. Spec. Grav. 1030. 30-40 WBcs per h.p.f. No casts. Inhalations with benzoin. Mucus coughed up is thicker and slightly green color. Pain in right chest. Cod. sul. gr. i. at 1:50 P.M. 6 P.M. Amytol gr. iii. 10:20 P.M. cod. sul. gr. i. Severe coughing spell.

1-15-31 - T 99.8 P 115, R 30 Pain in right chest. Emesis of undigested food. Stern inhalation. Amytol gr. iii 6:30 P.M.

1-16-31 - Inhalation q.d. Expectoration less. Pain on moving. Resp. more rapid 28-32. Urine negative. Hb. 62%, WBcs 3,280,000.

1-18-31 - Considerable drainage. Pain. Blood in stools. T 98, P90, R 24.

1-19-31 - Stools negative for benzidine. Urine - 20-30 WBcs per h.p.f. otherwise negative. Albumin negative. X-ray - left chest findings essentially the same, except that there is some evidence of fluid in the right chest. S.S.enema.

Tinged with blood on return. 9:15 M.S. gr. 1/8 9:40 M.S. gr. 1/8, 10 H.M.G. #1. To operating room. Anesthesia: Ethylene. Operative procedure: Old incision over 7th and 8th ribs nasillary line was opened. Abscess cavity dilated with finger. Brisk temporary hemorrhage. Bleeding controlled after separating lung from chest wall. Pack inserted. Subsequent operative procedures will undoubtedly be necessary in order to combat this condition adequately. Patient has had some difficulty in swallowing lately due to retraction of mediastinus toward the left. Several operative procedures will be necessary to cope with this condition. The greater part of the lung will probably have to be destroyed by cautery. It must be borne in mind that an associated malignancy may be present in the lung.

There appears to be cornification of the greater portion of the lungs. No Biopsy taken. Patient returned from the operating room in fair condition. 2,000 cc. 10% glucose. Color poor, skin warm and moist. 4:15 P.M. M.S. gr. 1/4 9:15 M.S. gr. 1/4. No bleeding. Respirations rapid, somewhat labored.

1-20-31 - 1 A. M. M. S. gr. 1/4. Coughing. Some blood on gown. Severe pain over right side. 11 A.M. Small amount of drainage, (bloody). M.S. gr. 1/4. 8:30 P.M. M. S. 1/4. Coughing. Urine - Sugar 1 plus. Centrifuged showed 10-20 WBcs per h.p.f. occasional casts.

1-21-31 - No. 60% WBcs 3,790,000 WBcs. Moderate cough. Moderate drainage. Patient weaker. Pain in chest. Soft diet. Urine - Sugar 1 plus, otherwise negative.

1-22-31 - Liquid diet. Pain in chest. Large amount of drainage. Very weak. 4:30 P. M. Packing removed. Dichloramine T pack inserted. Purulent drainage. Enosis 200 cc.

1-23-31 - Insulin units v.t.i.d. Pain in chest. Large amount of drainage. Considerable cough 9 P.M. Bloody drainage on dressings. Coughing. Packing inserted. Enosis 100 cc.

1-24-31 - Pain in side. Weaker. At 2 A.M. and 9:30 P.M. cod sulphate gr.i T 98, P 80, R20. Enosis of 450 cc.

1-25-31 - Insulin units viii t.i.d. ac. Packing changed. Pain in chest. Large amount of pus drainage. Patient considerably weaker with large amount of coughing. Emesis 300 cc.

1-26-31 - Unable to move right arm. Weakness, Restless. Sputum 200 cc.

1-27-31 - Sputum 500 cc.

1-28-31 - 2:35 A. M. and 8 P. M. Cod. sul. gr. i. Feels stronger. Reddened areas on right hip from pressure. 3 P.M. Transfusion 800 cc. whole uncitrated blood by means of 3 Vincent tubes. Both veins cut down upon. No reaction. Urine negative except for an occasional RBC. Large amount of purulent drainage. Sputum 360 cc.

1-29-31 Hb. 69%. RBCs 4,000,000. Sputum 200 cc. T 99.2, P 120, R 20. Large amount drainage.

1-30-31 - 3 P. M. Considerable bright bloody drainage. Coughing. 5 P.M. No bleeding. 7:30 P.M. Packing changed. Dressing saturated with blood. Sputum 600 cc.

1-31-31 - Stronger. Large amount of drainage. Coughs considerably. Perspires profusely. Patient unable to swallow. Refus tube or a large stomach tube for the purpose of taking a high caloric tube feeding. Patient could swallow food but with some slight difficulty. Has lost 59# since admission (wt. 151#). Sputum 450 cc.

2-1-31 - Packing removed. Dich. T packing inserted. Feels stronger. Large amount of drainage. Patient rapidly losing ground. 1 P. M. Transfusion 500 cc. blood direct method. 11:30 A.M. Profuse bleeding from upper wound. 11:35 A.M. Dressings changed. Returned from operating room at 2:25 P.M. Pulse rapid and weak. 9:20 P.M. Dressings changed. Saturated with blood. Perspires profusely. Picture becomes more suggestive of carcinoma of the lungs. Patient eats poorly. Hb. 62%, RBCs 3,600,000 Sputus 700 cc.

2-3-31 - T 96, P 100. 2 A.M. M.S. gr 1/4. 11:40 A.M. M.S.gr. 1/4. Coughing freely. No signs of hemorrhage. 9:15 P.M. Amytol gr. iii. Not retained. 9:30 P.M. Emesis of water, slightly blood tinged. 11:20 Cod. sul. gr. i. Sputum 300 cc. Elix. Terp. hydr. dr. i. q 3 h.

2-4-31 - Breathing difficult. Drainage profuse. Nervous. Continuous coughing. Pain on movement of left arm. T 99.6, P 120. Elix terp hydr. Nauseated. Sputum 200 cc.

2-5-31 - Amm. Chloride gr. x t.i.d. Coughing less. Weak. A great many rales in chest. T 98, P 120.

2-6-31 - 4:15 A. M. Hemorrhaged about 150-200 cc. blood. Packed with 2 strips of gauze. Hemorrhage stopped. Respirations rapid. Continuous gurgles in chest. Could not raise anything. Patient propped himself on right arm and stayed that way. Repeated small emesis of 10-15 cc. M.S.gr. 1/4 given to quiet him. 5:30 A. M. expired. T 96, P 120.

Autopsy -

The body is that of a well developed, fairly well nourished white adult male 186 cm. in length, weighing approximately 175#. Rigor is present. Hypostasis is purplish and posterior. There is no edema, cymosis or jaundice. The skin shows a slightly yellowish pallor. There is an old deformity of the distal portion of the right lower extremity due to an old fracture. There is thickening of the bones without any superficial changes in the structure. The pupils are 5 mm. in diameter and regular. The eyes are prominent. There is slight post-mortem discoloration of the sclera. The teeth show dental repair. There is a 9 cm. incision in the left posterior axillary line between the 7th and the 8th ribs. There is a 3 cm. incision in the anterior axillary line in the upper end of an old operation scar 13 cm. in length. The more recent scar is in the 3rd interspace on the left side. There are 2 scars in the right antecubital space 1 cm. in length. The incised wounds lead to cavities, both of which were packed with gauze sponges. There was evidence of recent hemorrhage at the dorsal one. The openings are covered with surgical dressing.



The subcutaneous fat over the anterior abdominal wall measures 2 cm. in thickness. No excess peritoneal fluid. The omentum is adherent to the peritoneum in the right upper quadrant. There are a few adhesions present in this region. The liver was not enlarged but placed downward, The APPENDIX is free. The Diaphragm is at the 5th rib right, 6th rib left. When the chest plate is removed, dense adhesions are encountered. There are a few adhesions on the right side on the anterior surface. When the right lung is lifted up dense adhesions are encountered in the posterior portion. When these are liberated they are found to enclose fibrino-purulent exudate with very little fluid. The left pleural cavity is densely adherent and dissected with difficulty. When the adhesions were being liberated, fluid collections of purulent exudate were found in the region of the left upper lobe near the incised wound and patch previously described at the 3rd interspace. A similar collection of pus was found in connection with the dorsal opening. Cloudy blood was also found in the latter region. The pericardial one was opened and contained about 400 cs. sero-fibrino-purulent exudate. The heart was covered with a similar exudate. A careful dissection of the superior mediastinum and a removal of the entire contents of the pleural cavities is now made. When this specimen is examined the following changes are found: THE LEFT LUNG is incised from the periphery to the hilum and shows the following changes: There is marked involvement of the lower 3/4 of the lung in a case of necrotic, infiltrating, firm, nodular, yellowish white tumor tissue with multiple cavities and one large softened area which communicates with the outside incision. This mass measures 15 x 12 x 12 cm. The PLEURA is rubbery and edematous and hard and 2 cm. in thickness. There are multiple areas of small, yellowish white structures, resembling small abscesses or deposits of tumor tissue. The upper portion of the lung suggests an entirely different picture. It is encapsulated by thickened pleura but is not so thick at the lower portion. It has a greyish red appearance and small structures resembling abscesses are seen. On palpation the surface is firm and the condition is either due to pneumonia (organizing) or tumor infiltration. Sections are made from this area to study. RIGHT LUNG: There is crepitation throughout and shows the exudate on the pleura previously described. The cut surface is red and multiple nodules are seen throughout the cut surface. These resemble pneumonic processes.

The surface of the HEART is covered with exudate. When the chambers are opened there is hypertrophy of the right ventricle. This is more marked in the region away from the conus where the muscle is 2 cm. in thickness. The left ventricle is 3 cm. in thickness. A careful search is made of the auricles and on the left side, by passing the finger out into the veins, tumor nodules are found protruding or pushing into the substance but not ulcerating through. The mass is then turned over and examined from behind. The AORTA has been cut and a large tumor mass in the mediastinum which is nodular and necrotic is found. It shows interference with the lumina for a distance of about 9 cm. There is no invasion of the wall on the innermost surface. The esophagus is also caught in this same mass for approximately the same distance. At this point there is ulceration and gangrene through the walls probably due to invasion of tumor tissue. The obstruction to the esophagus is apparently greater to the aorta. From the amount of involvement of the wall of the esophagus, it is probable that the tumor eroded it secondarily and that this area was not the primary scene of the growth. This large mass of tumor tissue which has encroached on the aorta and the esophagus is a firm, whitish structure and has a mucinous feel. It is approximately 9 cm. in diameter and extends over to the right hilum of the lung where only extends for a short distance. Tumor nodules are also found in the posterior mediastinum pushing into the pericardial sac from behind. There is marked tumor involvement in the left hilum and when the bronchi are dissected out, they run into a mass of tumor tissue in this region.

The SPLEEN weighs 400 grams and is enlarged. The surface is fairly smooth, and purplish red in color. The pulp is firm. On section there is mottling and no evidence of tumor tissue is seen. The Trabeculas and corpuscles

are negative.

The LIVER weighs 1,650 grams. The surface is smooth. On section the cut surface shows slight darkening of the centers of the lobules. The GALLBLADDER and MUCOUS MEMBRANES show a strawberry change. No evidence of tumor tissue in the gallbladder or mucous membrane. The GASTRO-INTESTINAL TRACT is negative except for gaseous distention of the stomach.

The PANCREAS weighs 150 grams. The LEFT ADRENAL is normal. The RIGHT ADRENAL shows a nodular thickening in the central portion. There is a considerable number of enlarged glands with definite capsules and a grey, soft structure on section. None of them showed a firm structure.

The RIGHT KIDNEY weighed 300 grams. the LEFT 260. The capsules strip easily from both exposing fairly smooth surface on the left. On section the left does not show any particular change. The right shows a definitely encapsulated structure in the upper pole about 3 cm. in diameter. The lower 2/3 of this structure resembles tumor tissue seen in hypernephroma. It is soft and cystic and yellowish brown in color. The upper portion shows an encysted mucoid structure. The tissue in this region is composed of glary, greenish yellow, grey tissue. The PELVIS, URETERS and BLADDER are normal. The GENITALIA are normal. The ABDOMINAL AORTA shows slight sclerotic changes. the LYMPH NODES of the retroperitoneal space are slightly enlarged. The THYROID is normal. There is a deposit of enlarged gland in the right supra-clavicular space in the midline. None on the left. No permission for examination of the head granted.

#### DIAGNOSIS:

1. Bronchogenic carcinoma of left lung.
2. Extension into lung substance, mediastinum and hilum of right lung.
3. Constriction of esophagus and aorta.
4. Gangrenous ulceration of esophagus.
5. Softening, necrosis and abscess formation of tumor tissue.
6. Confluent pneumonia of left apex.
7. Multiple military abscesses of left lung.
8. Pulmonary congestion and edema, right.
9. Probable broncho-pneumonia, right.
10. Acute sero-fibrino-purulent pericarditis.
11. Encapsulated empysema, dorsal portion of right pleural cavity.
12. Encapsulated empysema, left.
13. Hemorrhage of left lung.
14. Operated fistulous tract.
15. Hypertrophy of right ventricle.
16. Chronic, passive congestion of liver.
17. Adenoma of right kidney (degenerative changes).
18. Old deformity of right leg.
19. Splenomegaly.
20. Strawberry gallbladder (cholesterosis).
21. Gaseous distention of stomach.
22. Adenoma of right adrenal.
23. Hyperplasia of gland in celiac region.
24. Hyperplasia of glands in right supraclavicular space.
25. Pleural adhesions.
26. Decubitus scars.
27. Slight gnathostomatosis.

Comment:

The history of a typical respiratory infection finally led to the diagnosis of bronchiogenic carcinoma. The sex and age are suggestive. The development of hemorrhage was the thing which first pointed the way to possible malignancy. Fairly early bronchoscopic examination was made but no tissue was taken. Bloody granulations were found at this time. The esophageal obstruction was noted as the process extended. No examination of the brain was permitted, which may have revealed something because of the invasion of the vessels of the lung. The finding of a tumor in the kidney is interesting. The possibility of metastatic deposits in the lungs from this source were considered. The kidney tumor is, however, a typical benign nephroma which may have given rise later to a malignant of tumor. Grossly the entire tumor process was confined within the chest, although enlarged nodes were found in the supraclavicular and celiac regions. The changes in the heart are interesting because there was hypertrophy of the right ventricle, as well as an associated pericarditis (usual).

III. ABSTRACTS - Primary bronchial carcinoma (bronchiogenic carcinoma).  
Abstr. Henrikson.

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(1) Historical (Weller 7)

1. Morgagni (1761), Bayle, (1810), Stokes, (1837 & 1842) Reported observations on the disease but secondary tumors were probably involved. Werner (1891) found only 9 verified cases. Passler, (1896) listed 70 which he thought authentic. Adler (1912) Found 374 cases of carcinoma and 30 cases of sarcoma in literature. Many, however, were not confirmed microscopically. Inherent weakness of most studies lies in (1) failure to search for the primary focus, (2) make careful microscopic examination, and (3) to exclude doubtful cases. Spontaneous occurrence in animals is well known. Cats, dogs, cattle, horses, rarely rabbits and guinea pigs (mice more often).

II. Incidence: Note: Only studies based on autopsies are of importance.  
(Weller 7)

Compiler	Period	Autopsies	Cas.	Ca. of Lung	% of Ca. of Lung in Autop.	% of Ca. of Lung in all types of Ca.
Tanchow	Before 1844	--	8,289	8	--	0.09
Reinhard	1852-1876	8,716	545	5	0.057	0.96
Wolf	1877-1884	4,172	--	9	0.21	--
Fuchs	1854-1885	12,307	--	8	0.065	--
Passler	1881-1894	9,246	870	16	0.17	1.83
Wolf	1885-1894	7,228	--	31	0.428	--
Kikuth	1889-1899	13,777	--	10	0.07	--
Feilchenfeld	1895-1900	--	507	22	--	5.3
Redlich	1900-1905	--	496	31	--	6.3
Kikuth	1900-1911	22,819	--	--	0.39	--
Bejack	1908-1913	--	692	33	--	4.8
Briese	1898-1916	12,971	1,287	60	0.47	4.51
Bilz	1910-1919	--	--	18	--	2.57
Barron(HofM)	1899-1921	4,362	--	13	0.29	--
Stahelin	1900-1924	--	--	--	--	4.0
	(1910-1914)	--	--)		( --	2.2
Berhlinger	(1915-1919	--	--)	42	( --	2.9
	(1920-1924	--	--)		( --	8.3
Lubarsch	1920	86,216	8,301	450	0.52	5.4
Kikuth	1912-1923	21,588+	--	146	0.7-	--
Grove & Kramer	1917-1924	3,659	--	21	0.57	--
Beckwoldt	1914-1925	--	--	--	0.38	3.2
	(1895-1904	10,167	763	8	0.07	1.04
Holzer	(1905-1914	9,405	766	18	0.19	2.36
	(1915-1924	10,190	733	48	0.47	6.69
	( 1900-1906	--	--)		( --	5.1
	( 1907-1913	--	--)		( --	6.88
Seyforth	( 1914-1918	--	--)	307	( --	11.23
	( 1919-1923	--	--)		( --	8.75
	(6 Mos.of 1924	--	--)		( --	15.5
Margarinos & Penna	Before 1927	1,531	99	3	0.195	3.09
Wells	1927	--	403	17	--	4.2
Weller	1892-1927	2,450	244	10	0.4	4.1
McCrae, Funk, & Jackson	1924-1927	621	53	4	.64	7.5

Controlled evidence in the following table: (Single Observer)

<u>Compiler &amp; Institution</u>	<u>Period</u>	<u>% of Ca. of Lung in all Autopsies</u>	<u>% of Ca. of Lung in all types of Ca.</u>
Reinhard (Dresden); Wolf (Dresden)	1852-'76	0.057	
	1877-'84	0.21	
	1885-'94	0.428	
Kikuth (Hassburg-Eppendorf)	1889-'99	0.07	
	1900-'11	0.39	
	1912-'23	0.7-(?)	
Beckwoldt (Barmbeck-Hamburg)	1914-'19	0.36	3.7
	1920-'25	.39	2.7

Beyforth (Leipzig)	1900-'06	--	5.1
	1907-'13	--	6.88
	1914-'18	--	11.23
	1919-'23	--	8.75
	1st half - 1924	--	15.5
Stähelin (Basel)	1900-'11	0.20	--
	1912-'14	0.50	--
	1915-'23	0.63	--
	1924	0.67	--
Holzer (Prague)	1895-1904	0.07	1.04
	1905-1914	0.19	2.36
	1915-1924	0.47	6.69
Barron (Mayo) (U of Minn.)	1899-1911	0.0	--
	1912-1918	0.2	--
	1919-1921	0.9	--
Assman (Leipzig)	1900-1906	0.67	5.01
	1907-1913	0.9	6.88
	1914-1918	1.01	11.23
	1919-1922	1.54	9.17
Weller (U of Mich.)	Autopsies		
	1-1000	0.1	--
	1000-2000	0.5	--
	2001-2450	.8	--

Manchester Committee on Cancer investigated six centers. 53,757 autopsies show clear and steady rise from 0.94% in five year period (1903-07) up to 1.69% (1923-27). Individual places show same increases (Ref. 11).

Comment: Evidence indicates that in Europe and America primary carcinoma of lung and bronchi is found in about 0.5% of all autopsies, and in about 5% of all deaths from carcinoma, and the disease is on the increase. Sharpest rise in incidence occurred in 1910 (or 1918?). (Is this actual?) Suggestions have been made, (1) that it is, (2) or that it is due to increased interest, or (3) the classification of more tumors as carcinoma than sarcoma (Boyd) 5). Most significant is increase in incidence in large institutions with unchanging personnel. The x-ray factor is also important? but the diagnosis is usually made at autopsy and not during life.

III. Sex - 16 collected series of cases - 807 males, 280 females (2.8 to 1). (Weller 7). Primary carcinoma of large bronchi - 70 males to 17 females. (Lubarsch 7) 86,216 autopsies found carcinoma of lung comprised 8% of all carcinoma in men and 2.57% in women. (Funk 2) 61 patients with verified diagnosis of tumor (bronchoscopically 36 cases, surgically 8 cases, post-mortem 20 cases). Found 50 men and 11 women.

IV. Age (Weller 7)

Age	Holzer (76) (1895-1924)	Breckwith (47) (1914-1925)	Kikuth (246) (1912-1923)	Brunn (576)
1-20 yrs.				7
20-30 "	1		7	
30-40 "	10		18	(20-40) 60
40-50 "	18		49	
50-60 "	30	15	77	(40-60) 361
60-70 "	12	15	60	
70-80 "	5		30	(60-80) 144
80-Up	0		5	(80-Up) 4

Weller 7 - Apex was between 58 and 62 years in 1100 verified cases.

Funk 2 - found two cases under 35 (24 & 27), 27 between 35 & 45 (44.2% of 61).

Youngest was a 24 year female, oldest 73 year old male. Reports tendency for it

to develop earlier than has been noted in other series.

V. Occupation: Report of Saxon Cancer Committee (1922).

Of 154 miners (employed 10-45 years) studied in an investigation over a 3-1/4 year period, 21 died. 62% of this group had carcinoma of lung (verified). If two who had not worked in mines for many years are included (71%). All worked in cobalt mines (also bismuth and arsenic) in the Schneeberg district in Saxony. (All cases of pneumokoniosis). 362 persons not working in mines were examined and not one had a carcinoma of the lungs or pneumokoniosis. Has been noted as a disease of laborers and handworkers, most common in cigar-makers, metal workers, typesetters, printers, blacksmiths, colliers, smelterers, chemists; members of the learned professions being relatively immune. Schneeberg ores are radio-active (50 Mache units), also contain arsenic (0.45%) and fungi.

VI. Etiology (Weller)

1. Tuberculosis - Ewing - Chief factor. Kikuth - Small role. Only 22 out of 246 patients had this disease. Roughly in accord with known incidence of tuberculosis in unselected cases. 2. External mechanical trauma. Only occasional history. 3. Acute and Chronic infections. (fibroid pneumonia, bronchiectasis, influenza (before influenza epidemic cancer showed low incidence)). No increase after pandemic of 1889-1894? Increase already apparent before last epidemic of 1919-1920? Only of importance as it brings about complications like fibroid pneumonia, interstitial, etc. 4. Chronic irritation - Mechanical, chemical, thermal and radioactive. It is thought cobalt miners are exposed to dampness, fungi, heavy metals, arsenic, sulphur and radioactive ores. (Not reproduced in animals using dusts). 6. Experimentally - Produced in laboratory animals with paraffin, HCl, tar, and tar derivatives, and silica dust. Chemical irritants mentioned in men are: coal dust, tobacco dust and smoke, silicates, chemical fumes, war gases, gasoline fumes, tar and heavy oils. Familial tendencies not studied in man as yet. Note most of cases occur in males suggesting some type of irritant.

VII. Location - Chiefly bronchiogenic. Kikuth (179 out of 225), Beckwoldt (36 out of 47), Weller (10-1 of bronchiogenic origin). Usual figure quoted 90%.

<u>Lung involved</u>	<u>Right</u>	<u>Left</u>	<u>Both lungs</u>	<u>Doubtful</u>
Reinhard (1878)	18	9		
Kikuth	123	118	5	
Beckwoldt	273	230		
Hanf	72	95		
Brunn plus Adler's	283	246	26	3 and 68

Kikuth - Right upper & middle lobe - 38. Right lower lobe - 35. Left upper - 31. Left lower - 30. Both 57.

Beckwoldt - Right upper lobe more frequently than any other.

VIII. Types -

A. Hilar type - 90%. (1) Practically always bronchiogenic. (2) May arise outside of lung at bifurcation. (3) Frequent site is near mouth of first lobar branch. (4) Grossly-roughening to polypoid mass. (5) May cause bronchial stenosis. (6) May fill mediastinum or may cause death while still small. (7) Cross section - bronchi infiltrated, lumina plugged. (8) Consistency - usually firm, yellowish white. (9) May have areas of necrosis, secondary infection, and cavitation.

B. Nodular type - (1) Less common. (2) Develops in substance of lobe. (3) Multiple foci very rare - think of metastases!

C. Diffuse type - (1) Frequently bilateral - consider metastases? (2) Unilateral - occurs at times. (3) Grossly - looks like gray

hepatization of croupous pneumonia. Alveoli filled with papillomatous collection of columnar epithelial cells arranged in a delicate fibrous support of dendritic structure. May have forms representing several of these types.

IX. Regional Extension: (1) Pericardium and heart involved more frequently by these tumors than any other. Brunn - 21%.

Usually direct extension. (Note previous case reported by Dr. C. H. Mean, Minnesota). (2) Great vessels - superior vena cava and pulmonary veins. (3) Oesophagus - middle third. (Dysphagia). (4) Traches - "cornage" sign of the French. (5) Regional nerves - recurrent laryngeal paralysis, unequal pupils, pain along intercostals. Thoracic, abdomen or back pain in 50% of the cases. (6) Direct extension to thoracic wall - rare.

X. Metastases - Rarely fails to produce metastasis. Beckwoldt - 37 of 43.

Regional nodes always involved. Klotz- all except one.

Kikuth - (246) Liver 70, skeleton 48, lungs 43, brain 31, kidney 25, suprarenals 21, pancreas 11, thyroid 5, heart 4. Dosquet (105) - brain 31.5%, suprarenals, 21.8%. Fried & Buckley, Ref. 3 - Metastases to central nervous system found in 15 of 37 patients with bronchiogenic cancer. In 11 of the 15 patients, a diagnosis of primary tumor of the brain was made, and bronchiogenic tumor was overlooked. In the remaining four patients, a definite diagnosis could not be made. Intracranial operation was performed on 11 of the patients, and a metastatic tumor was removed in 10 instances. The postoperative survival period of the patients with solitary cerebral metastasis varied from 5 months to 7 years. An early postoperative fatality resulted in every patient with multiple cerebral metastasis. It is believed that when a person of middle age has abrupt onset of symptoms and signs of a rapidly developing intracranial lesion, a metastatic cerebral lesion should be considered (the lung being the most common site of the primary lesion). It is realized, however, that even in instances in which examination of the lungs yields negative results, the presence of a primary tumor in these organs cannot be excluded. A metastasis to the brain from a primary pulmonary tumor was commonly mistaken for a rapidly growing glioma, a cerebral vascular lesion or encephalitis. Apparently the pulmonary tumor metastasizes to the brain by way of the blood stream. The relatively great frequency of intracranial metastasis is due in all probability to the fact that a tumor embolus from pulmonary carcinoma passes from the pulmonary vein directly into the cerebral circulation, whereas cancers from other viscera on their way to the brain are primarily retained by the lungs, where they may remain indefinitely, often being altogether destroyed. There is an outstanding reaction on the part of microglia and astrocytes to the metastatic lesion, the response being very much like that found in experimental studies on the reaction of the brain to wounds and to infectious invaders. (Note: Dunlap report shows same change, that is gliosis).

XI. Pathologist in diagnosis of carcinoma of the Lung (intra vitan).

(1) Bronchoscopist may remove section for study. (2) Biopsy of secondary metastasis. (3) Sputum - "currant-jelly" or "raspberry jelly" rare. Streaking with blood or hemorrhage occurs. Fragments of tumor (One at Minn.). (4) Probatory puncture - biopsy from pieces obtained. (5) Pleural fluid - cells 79% in 38 fluids.

Most carcinomas of lung can be classified as (1) undifferentiated cell carcinomas, formerly called sarcomas, (resemble the microscopic sections seen in our case). (2) Squamous cell carcinoma - cornifying and non-cornifying. (3) Cylindric cell Carcinoma - Barron says last most common. Primary sarcoma of lung one of rarest blastomas apart from lymphosarcomas of lymphoid apparatus.

XII. Diagnosis: (Funk) Clinical manifestations (61 cases) depend on (1) Location and Rapidity of growth. (2) Degree of bronchial obstruction. (3) Presence of secondary infection and suppuration. (4) Pressure on adjacent structures. (5) Occurrence of pleural involvement, not infrequently associated with effusion. (6) Influence of local and general metastases.

A. Onset - usually insidious but may be sudden with pain in chest, pulmonary hemorrhage, dyspnea or symptoms resembling acute bronchitis (note: our patient had story of upper respiratory infection at beginning). In one third of patients onset was like acute respiratory tract infection (cold, cough and fever, cough with pain in side, acute bronchitis, pneumonia). B. Frequency: Cough 88%, expectoration 57%, pain 72%, hemoptysis 45%, dyspnea 50%, weakness and weight loss 80%, hoarseness 5%. Cough - Not characteristic. Usually early and continuous, with periods of improvement and aggravation. May interfere with sleep; wheezing may be mistaken for asthma; late may resemble aortic aneurism (brassy), May be associated with paralysis of the recurrent laryngeal nerve. Expectoration: may be absent, scanty, mucoid or profuse and purulent. In one third there was a suggestion of a pulmonary suppuration. Currant-jelly sputum is rare. When tubercle bacilli are not demonstrated, in chronic pulmonary disease, diagnosis of tumor should be considered. No tumor was coughed up for diagnostic purposes. Hemoptysis in about half, early or late, streaking to frank hemorrhage; fatal hemorrhage rare, secondary anemia in some. Mild dyspnea on exertion is common. More marked with bronchial occlusion or complicating pleurisy with effusion. May be first or principal symptom, but usually develops during course and is associated with other local signs. Cyanosis parallels dyspnea. Severe forms usually late. Pain in chest common. Next to cough, most frequent. Frequently early complaint. Various locations. Sharp or dull, intermittent or continuous. Becomes worse with progress of disease. Dysphagia usually late (note: our case). General symptoms: Fever, weakness, loss of weight and pallor - variable in time of appearance - usually late. Fever is due to associated bronchitis, pulmonary suppuration, bronchiectasis, bronchopneumonia, pleurisy, (tumor?). May be slight or marked with remissions. Often associated with chills and sweats (especially with abscess formation). Rapid pulse with pyrexia in late stages - cachexia. Extra-thoracic metastases usually late. Supraclavicular nodes usually involved early. They may be small and overlooked. 8 cases developed metastases to nervous system (13%), cerebral (6), spinal (2). Abdominal organs 4 (6%). Effects of pressure (late); (1) dilated vein of head, neck, upper extremities, thorax and abdomen. (2) Laryngeal paralysis. (3) Dysphagia. (4) Inequality of radial pulses.

C. Physical Findings. Not pathognomonic. (1) May be none. (2) Usually early those of bronchial irritation. (3) Unilateral limitation of expansion most common sign. (4) Usual signs are those of associated conditions: (a) Bronchiectasis, (b) Obstruction and atelectasis, (c) Obstruction and emphysema, (d) Abscess, (e) Bronchitis?, (f) Pleurisy with or without effusion. X-ray is valuable, especially if hilar mass is sufficiently large and not obscured by pathological changes in lung and pleura. Bronchoscopic examination (Jackson) is only method that can make early diagnosis with reasonable certainty. (In our case it failed because no biopsy was taken).

D. Diagnosis will be made if it is recalled the possibility of bronchiogenic carcinoma in adults with obscure pulmonary disease. A complete study should be made to rule out tuberculosis, bronchial obstruction, esophageal carcinoma, tracheal carcinoma, pulmonary abscess, syphilis, pneumoconiosis, mycosis and pleurisy. Involvement of pleura usually takes place at some time during course. Tumor should be suspected in simple exudative, hemorrhagic or purulent effusion. Found in 16 of 62 (26.2%). 10 (hemorrhagic) 3 (purulent).

E. Prognosis: depends on time of diagnosis. 11 of 20 died (one year). 6 of 20 (one and one half years). One well after 6 years. X-ray treatment seems to prolong life.



Cottin, E., Cramer, M. and Saloy, M., (Du Diagnostic Des Cancers Primitifs Du Poumon (Etude Clinique Sur 29 cas.) Annals de Medicine VIII, believe diagnosis can be made when following are present: (1) Insidious onset. (2) Pulmonary induration. (3) Dyspnea (most constant). (4) Cough. (5) Continuous bloody expectoration. (6) Subclavicular and axillary adenopathy. (7) Thoracic pain from pressure on nerves.

XIII. Carmen - Differential diagnosis (x-ray) must be made between (1) simple chronic pleuritis and pleural plaques, (2) Pleural effusion, (3) Encysted empyema, (4) Interlobar effusion, (5) Bronchiectasis, (6) Pneumoconiosis (advanced type), (7) Abscess of lung, (8) Hydatid cysts, (9) Dermoid cysts, (10) Lobar pneumonia, (11) Syphilis of lung, (12) Aneurism, (13) Primary sarcoma (no proven case at Mayo Clinic), (14) Lymphosarcoma, (15) Hodgkin's Disease, (16) Benign tumors, (17) Tuberculosis with areas of caseous pneumonia, (18) Metastatic carcinoma, (nodular and miliary types). Interlobar effusion troublesome but usually not connected with hilar shadow?; abscess of lung (may be malignant?) Hydatid cyst usually in right lower lobe. Dermoid cyst in mediastinum (perfect roundness as though traced by a compass). Lymphosarcoma usually bilateral (rapid growth). Hodgkin's disease may be confusing and unilateral type cannot be distinguished; both respond to x-ray radiation. Benign tumors rare. Metastatic tumor usually bilateral, sharply circumscribed. Miliary nodules may be developed from primary lesion, but usually from metastatic. Corresponding to the pathological changes, two chief roentgenological types can be recognized. - Lobar (often extensive) may not be accompanied by hilar shadows or Miliary multiple small shadows (bilateral). Hilar groups two types: round and circumscribed with irregular border shadowed extension, Extensive dense, lobar shadow attended by smaller shadows of metastasis is considered pathognomonic.

#### XIV. Summary:

1. Bronchiogenic carcinoma has been recognized since (1761?) 1891.
2. Disease occurs in animals.
3. It is on the increase (actual, greater interest or fewer diagnoses of primary sarcoma).
4. Predominates in males (marked).
5. Age incidence (peak at 58-62 in 1100 cases), 1929. (35-45) 1931.
6. Occupational factor (laborers and handworkers), cigar makers, metal workers, type-setters, printers, blacksmiths, colliers, smelterers, chemists.
7. The famous Schneeberg tumor develops as the result of pneumoconiosis (ore).
8. Chronic proliferative pulmonary processes are also a factor (influenza?), Tuberculosis is not?
9. Disease has been produced experimentally (inhalation of irritants).
10. Origin is chiefly from bronchi (90+%).
11. Both sides are equally involved.
12. Right upper lobe is frequent site.
13. Because of frequent hilar location secondary lung changes (stenosis, suppuration) are common.
14. Regional extension to heart, great vessels, lumen of bronchi, oesophagus and mediastinum, is frequent.
15. Metastasis, to liver, skeleton, other lung, brain, kidney, supra-renal, pancreas, thyroid and heart are recorded.
16. Metastasis to brain should always be considered (40%) in one series.
17. Bronchoscopic biopsies are the only means of absolute diagnosis.
18. "Currant jelly" sputum is said to be rare.
19. Tumors present variable histological, epithelial structure.
20. Chief symptoms are cough, expectoration, pain, hemoptysis, dyspnoea, weakness, weight loss and hoarseness.

21. Physical findings may be confusing.
22. X-ray diagnosis is often difficult as tumor may be obscured by other changes and frequently resembles other lesions.
23. Diagnosis can be made by remembering possibility of carcinoma of lung in adults with obscure (or common) respiratory disease, brain tumors or other mental disorders.
24. Intrathoracic radiation may offer possibility of alleviation.
25. An increasing number of diagnoses are being made before autopsy.