

Staff Meeting Bulletin  
Hospitals of the » » »  
University of Minnesota

The Roentgen Diagnosis  
of Acute Pulmonary Diseases

STAFF MEETING BULLETIN  
HOSPITALS OF THE . . .  
UNIVERSITY OF MINNESOTA

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Volume X

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William A. O'Brien, M.D.

I.

A CHRISTMAS MESSAGE

"Peace on Earth, Good Will toward Men." Never since the days of the world war has this simple Christmas message had the significance that it has this year. War, hatred, selfishness seem to be rampant over the world. Yet, 'Peace and Good Will' is the foremost Christmas wish and prayer of millions of men and women in every land.

What a contrast to this world madness is the spirit of helpfulness and good will which permeates an institution such as this hospital, in which it is the privilege of each one of us to play some part. Here the entire staff is devoting itself wholeheartedly to the health and welfare of others. Here the alleviation, not the infliction of suffering; the prolongation, not the destruction of life are the objectives. Here studies are being conducted the purpose of which is to make the world a better and happier place to live.

Yet even here each one of us can add still more to his happiness and to the happiness of others during this Christmas Season by a little special thoughtfulness for our colleagues and for the patients under our care. An expression of personal interest, a word of encouragement, a hand clasp and a smile may lighten a burden that seems almost too heavy to bear.

It is in this spirit that I say Merry Christmas and Happy New Year to each and every member of the staff.

Harold S. Diehl  
Dean

II. LAST WEEK

Date: December 9, 1938  
Place: Recreation Room  
 Powell Hall  
Time: 12:15 - 1:00 P.M.  
Program: Movie: "Brave Little Tailor"

## Announcements

"Benign" Lymphocytic  
 Meningitis

J. E. Skogland  
 A. B. Baker

## Discussion

Reuben Pennington  
 Arild Hansen  
 Wesley Spink  
 J. E. Skogland  
 A. B. Baker

Gertrude Gunn  
 Record Librarian

\* \* \* \* \*

III. MOVIE

Title: "Mickey's Parrot"

A Walt Disney Picture

Released by: R-K-0

\* \* \*

IV. ANNOUNCEMENTSFall Quarter Program

September	30	Administration
October	7	Pathology
	14	Anesthesia
	21	Otolaryngology
	28	Pediatrics
November	4	Surgery
	11	Holiday
	18	Student Health Service
	25	Administration
December	2	Medicine
	9	Neuropsychiatry
	16	Diagnostic Roentgenology
	23	Holiday
	30	Holiday

Winter Quarter Program

January	6	Bacteriology
	13	Surgery
	20	Obstetrics and Gynecology
	27	Medicine
February	3	Ophthalmology
	10	Out-Patient Department
	17	Pediatrics
	24	Orthopedics
March	3	Neurosurgery
	10	Diagnostic Roentgenology
	17	Student Health Service
	24	Dermatology
	31	Holiday

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V.        THE ROENTGEN DIAGNOSIS  
              of  
ACUTE PULMONARY DISEASES

Leo G. Rigler  
Herman H. Jensen  
Curtis B. Nessa

GENERAL STATEMENT

Previously, the radical changes caused by acute inflammatory diseases of the lungs have not been studied so extensively as those due to chronic diseases, partly because of the difficulties in technique and partly because the patient is often too ill to allow more than the briefest examination. The films are necessarily taken by bedside machines which make them more difficult of interpretation; the patient often cannot refrain from motion during the exposure which markedly obscures the lung detail; pleural disease is often associated with its concomitant effusion which further clouds the picture. Nevertheless, with present apparatus, our experience indicates that roentgen examination at the bedside is a highly satisfactory procedure for the detection of gross pathological changes in the lungs. The examination may be accomplished with a minimum of disturbance to the patient, probably far less than that occasioned by a physical examination. The possibilities of visualization of the gross pathology in the lungs are so good that much has been added to our knowledge of the mode of onset of acute disease of the lungs and of its course; likewise we have been enabled to make earlier diagnoses by this method.

We have endeavored in this report to review the cases of pulmonary infarcts, bronchopneumonia and lobar pneumonia which have been diagnosed as such in this hospital, including those

in the Health Service, over a two-year period -- 1936-1938. Postoperative acute pulmonary conditions such as massive atelectasis, aspiration and postoperative pneumonia, etc., were not considered as separate groups. They represent a subject in themselves. Our purpose is to attempt a correlation between clinical and x-ray findings in order to compare the two types of procedure and to evaluate the importance of the roentgenogram in the early diagnosis of these acute pulmonary lesions. The clinical notes on many charts were entirely adequate, but, unfortunately, many were also very incomplete, in some cases no notes being present at all. In other cases the admitting roentgenograms were examined before a clinical diagnosis was attempted, and thus it was impossible to be sure whether the clinical diagnosis and localization would have been made without the x-ray examination.

PULMONARY INFARCTS

During the period surveyed there were only 17 cases in which the diagnosis of pulmonary infarction was quite definitely made. Most of the patients were of an upper age group; the youngest was 32; the median age for the group was 51. There were 9 males to 8 females. The comparison of diagnoses is shown in the following table.

Clinical Diagnosis	X-Ray Diagnosis	Autopsy Diagnosis	Duration from Roentgen Examination to Autopsy
1. Correct, but followed x-ray	Infarct RML	Fibrosis RM	60 days
2. Bronchopneumonia	Congestion	Infarcts RL-LL	4 days
3. Bronchopneumonia	Negative	Infarcts RL	20 days
4. Infarct RL	Infarct RL		
5. Infarct RL	Infarct RL		
6. No physical signs	Infarct LL		
7. Infarct Left	Effusion Left	Infarct LL	2 days
8. Infarct Right	Infarct RL		
9. Infarcts Multiple	Effusion Bilateral-Pn.	Infarcts LL-RL	5 days
10. Infarcts Multiple	Effusion Bilateral	Infarcts LL-RL	2 days
11. Myocardial Failure	Infarct RL	Infarcts LL-RL	25 days
12. No physical Signs	Infarct RL		
13. Infarct RL	Infarct RL		
14. Infarct Right	Infarct RL		
15. Cardiac Failure	Infarct RL	Congestive Failure	5 days
16. Correct, but followed x-ray 5 days	Infarct Right		
17. Diagnosis in retrospect	Infarct Left		

As shown by the above chart, the diagnosis was recorded in 12 of the 17 cases by x-ray examination, and in 11 of the 15 the diagnosis was clinically recorded. In 3 of the 11 cases diagnosed clinically, however, the diagnosis was made by means of the roentgenogram 1 to 5 days before the clinical diagnosis was recorded. In the second and third cases the diagnosis was missed both clinically and by x-ray examination. In the remaining patients the diagnosis either coincided or was made quite definitely either by the physical findings and clinical signs or by means of the roentgenogram. It is well to note that the post mortem findings need not necessarily nullify the ante mortem conclusions since death occurred 2 to 60 days following the last x-ray examination. There were 2 cases in the above group in which there were no physical findings and yet the roentgenogram quite clearly revealed the presence of an infarct. As to the 5 cases mis-diagnosed by x-ray examination, 1 was complicated by extreme congestion, and in 3 the lung fields were partially or completely obscured by effusion. In all 17 the lesions

were localized to the lower lobes or right middle lobe.

Dyspnoea was the predominant symptom in 11, pain in 5 and hemoptysis in one. It is interesting to observe also that 15 were on the basis of cardiac failure, 1 was apparently due to the thrombophlebitis of pregnancy, and 1 occurred following the termination of an abnormal pregnancy. The latter case was that of a woman with twin pregnancy and marked hydramnics. Premature labor developed at 6 months and two small hypoplastic fetii were passed together with 12 to 16 liters of fluid. There were no cervical lacerations and no signs of infection. Yet several days post partum hemoptysis occurred and a roentgenogram revealed an infarct of the left lower lobe.

Considerable experimentation has been done to show the close relationship between pulmonary congestion and infarction. Karsner and Ash (1) placed aseptic emboli in the pulmonary arteries of animals with both normal and congested lungs. Through this experiment they

were able to show that the circulatory changes were identical in both the normal and congested lungs during the first 24 hour period. At the end of that time, however, speedy resolution occurred in the normal lung, whereas in the congested lung infarction took place. Kirklin and Faust (2) came to the same conclusions following a study of clinical cases and believe many infarcts may disappear before roentgenograms are taken, if the circulation is competent.

Hosoi (3) reviewed 36 medical embolic cases which came to autopsy. Forty-two per cent were patients with gross cardiac disease and 50 per cent had some focus of infection. The hearts of all except 3 weighed over 400 grams and only 6 did not show evidence of infarction complicating embolism. Two-thirds of the infarcts were found in the lower lobes, somewhat more on the left. This finding was at variance with ours in which the infarcts were formed on the right twice as often as on the left. Sante (4), Wessler and Jaches (5) and others have described the characteristic picture of pulmonary infarcts as triangular shadows of increased density with the base at the periphery, most common in the bases of the lower lobes and in the most dependent portion of the upper lobes. The picture is often difficult to differentiate from bronchopneumonia or small abscesses. More recently, however, it has been recognized that the densities representing infarcts may take varied shapes. Smith (6) describes 6 types of shadows:

1. Vague clouding at the base of the lung, obscuring the costophrenic sinus and suggesting basal pneumonitis of influenzal type.
2. Shadows indicating an early effusion, either concealing a recent infarct or being superimposed later on obvious intrapulmonary shadows.
3. Localized shadowing not unlike that of lung abscess.
4. Density of greater or lesser ex-

tent, sometimes suggesting cavity formation and consequently even pulmonary tuberculosis.

5. Shadows at one base with ultimate elevation of the diaphragm indicating partial basal collapse.
6. Linear shadows representing scars of past healed infarcts, or, if found soon after the onset, possibly representing changes resulting from a thrombosed blood vessel.

Waters (7) concurs in the above opinion and believes furthermore that pulmonary infarcts in the vast majority of cases have no diagnostic radiologic sign. Be that as it may, it appears to be the consensus of opinion that many infarcts, conclusively shown at autopsy, may not cast a demonstrable shadow on the roentgenogram. Castleman and Hampton (8) took post mortem roentgenograms on 3500 autopsies and correlated the roentgenologic with the pathologic findings. They noticed a higher frequency of pulmonary infarcts among medical than among surgical patients. They attempted to determine the approximate age of an infarct and to follow an early one to its healing and healed stages. They believe that the linear scars of these later stages may account for many of the previously unexplained linear shadows seen in roentgenograms and that these unimpressive areas of fibrosis are undoubtedly overlooked at the routine post mortem examination.

We must conclude, therefore, from a perusal of the literature and our own cases that the roentgenogram is a valuable adjuvant in the diagnosis of pulmonary infarction and may demonstrate a lesion when there are no decisive clinical findings; however, if negative, it does not rule out pulmonary infarcts.

#### BRONCHOPNEUMONIA

Bronchopneumonia is defined by Sante (4) as a pneumonic process characterized by multiple small areas of infiltration clustering about the bronchi which follows direct extension through

the bronchial wall of infection previously present in the bronchi. It may be caused by any one of a great variety of organisms. Roentgenologically it is characterized by numerous areas of small soft infiltrations gathered about the bronchi, chiefly in the lower lobes, always multiple and often bilateral. The densities are feathery and ill-defined and may coalesce to form large irregular masses of density not confined to a lobe. Due to the inflammatory reaction there is an associated congestion of the lungs and an increase in the peribronchial markings.

### Differential Diagnosis

Bronchopneumonia may have a great variability of appearance and must be differentiated from a variety of lesions.

Tuberculosis may simulate it very closely and if the lower lobes alone are involved, the differentiation may be impossible. However, primary lower lobe tuberculosis is so rare that the diagnosis is not justified from any method of examination unless tubercle bacilli are repeatedly found in the sputum. Bronchopneumonia most commonly has its predominating involvement in the lower lobes, leaving the apices relatively free, whereas tuberculosis has its usual involvement in the upper lobes.

Resolving lobar pneumonia of the lower lobe may at some stage of resolution closely simulate bronchopneumonia. The fact that the former is usually unilateral and that rapid changes occur in appearance within a few days help to establish the pneumonic process as that of the lobar type.

Septic pneumonia occurs as a complication of a septicemia. The lesions are initiated by organisms deposited by the hematogenous route and consequently the densities seen on the roentgenogram do not have the peribronchial arrangement seen in bronchopneumonia; the lesions are more hazy and less well-defined, and must be interpreted in connection with the clinical history.

Atelactasis of the lower lobe, during reinflation, may be indistinguishable from bronchopneumonia. Atelectasis, however, is usually unilateral and tends to disappear more quickly than the lesion due to bronchopneumonia.

Interstitial pneumonia is a comparatively rare disease in which a diffuse infiltration of both lung fields may be seen manifesting numerous small areas of density interspersed with linear shadows representing fibrosis. The lesions resolve very slowly or not at all.

There are 3 forms of atypical bronchopneumonia which warrant special discussion: capillary pneumonia, influenzal pneumonia, and pneumonia due to the Friedländer bacillus.

Capillary pneumonia was first described by Assmann (9) as occurring after influenza and inhalation of caustic gas. In this condition connective tissue infiltration invades the terminal bronchioles and atria. In both these conditions and in miliary tuberculosis there is marked tachypnoea, cyanosis and all other signs of severe prostration so that clinically it is hard to tell them apart. The roentgenogram in both instances may be quite similar, but the densities in capillary pneumonia tend to be slightly larger, nearer the hilum and more irregular as to distribution and size.

Influenzal pneumonia tends to be associated with epidemics of influenza and to vary considerably in different epidemics as to severity and percentage involvement. Bowen (10) found definite parenchymal involvement in 5-25% of all influenza cases. Roentgenologically the lesions are seen to be usually basal; they are confluent, mottled, fan-shaped or rounded, and are usually of a homogenous moderate density in the central portion with the borders fading into the normal lung. It has the appearance of an exudative alveolar infiltration and is usually more localized and of more even density than the bronchopneumonias of childhood or than

those which complicate adult diseases. The course of the disease is much more easily followed by serial roentgenograms than by physical signs.

Pneumonia due to the Friedländer bacillus is usually rapidly fatal, but some patients survive, and in these the disease may be traced through its various stages. Kornblum (11) describes 3 stages. In the first stage there is a close resemblance to bronchopneumonia, but it seldom has the bilateral distribution of the latter and the involvement tends to be more at the periphery. In the second stage there is a coalescing of pneumonic lobules, and the appearance is that of lobar pneumonia; the process, however, does not follow lobar lines and resolution begins at the hilum and goes peripherally instead of progressing toward the hilum as in lobar pneumonia. In the third stage the dense consolidated areas develop into abscesses. If the patient survives there is left an irregular fibrosis with cavities which are characteristically thin walled.

We reviewed 107 cases classified in the cross index as bronchopneumonia. Seven cases had no roentgenograms taken, and 10 others developed a terminal bron-

chopneumonia clinically, but were not examined roentgenologically for a considerable period previous to death. The remaining 90 cases were checked carefully as to correlation between the roentgenologic and physical findings. The ratio of males to females was found to be 2:1. The median age for the group was 28. Twenty-three per cent were under 1 year of age. Twenty six were apparently primary while the rest were secondary to associated disease or surgical procedures. In 42% of the patients under 5 and in 22% of those over 5 the disease was apparently primary.

Ninety cases diagnosed as bronchopneumonia from the roentgenogram were diagnosed clinically as follows:

1. 53 as bronchopneumonia.
2. 13 as acute upper respiratory disease.
3. 6 as non-infectious diseases of the respiratory system.
4. 10 had miscellaneous diagnoses.
5. 8 had no diagnosis recorded.

Twenty-one cases in the group were studied as post mortem, the results of which may be seen in the following chart.

#### Twenty-One Cases with Autopsy Reports

	(1. Roentgenologically - 21 cases.
Diagnosis of Bronchopneumonia	(2. Clinically - 19 cases.
	(3. Post Mortem - 16 cases.

Comparison of Post Mortem Diagnosis with Roentgenological and Clinical Diagnosis in 7 Cases where Post Mortem Diagnosis was other than Bronchopneumonia.

Number of cases	Roentgenological Diagnosis	Clinical Diagnosis	Autopsy Diagnosis	Duration from Roentgen examination to Autopsy
*1	Bronchopneumonia	Uremia and Bronchopneumonia	Lipoid Pneumonia Bronchopneumonia	2 days
*1	Bronchopneumonia	Bronchopneumonia	Interstitial Pneumonia	3 days
1	Bronchopneumonia	Bronchopneumonia	Tuberculosis - Bilateral Apical Chronic	3 days
1	Bronchopneumonia	Cardiac Decompensation	Bronchiectasis Edema	4 days
1	Bronchopneumonia	Bronchopneumonia	Hemothorax (accident)	5 days
1	Bronchopneumonia	Bronchopneumonia	Carcinoma of Pancreas (no lung involvement)	3 days
1	Bronchopneumonia	Carcinoma of stomach	Carcinoma of stomach	1 day

\*These are included in the 16 cases indicated above.

From the chart it can be seen that there was agreement in 14 cases as to the clinical, radiologic and post mortem diagnosis. Two others showed interstitial pneumonia and a combination of bronchopneumonia and lipoid pneumonia in which the roentgen diagnosis of bronchopneumonia is essentially correct. It must be realized that in many patients in this group it was difficult to obtain a satisfactory film because of the condition of the patient; in some cases request for further examination could not be fulfilled and in others congestion, pleural fluid, etc. greatly added to the difficulty of diagnosis. In the presence of pleural effusion or marked pulmonary congestion the shadows of consolidation are so obscured that accurate diagnosis is impossible.

We must conclude, therefore, that in bronchopneumonia roentgenographic examination is not an infallible procedure, but is to be considered a useful aid to clinical impressions; that it is important in checking the true extent of involvement at any time and to assist in following the progress of the patient. It must also be added that when a patient is extremely ill, it may be less disturbing to investigate pulmonary involvement by x-ray examination than to subject him to a chest examination by clinical means.

#### LOBAR PNEUMONIA

It is in lobar pneumonia that the roentgen examination has its greatest value, the areas of consolidation being more distinct, more extensive, and more dense than in other types. It is an acute pulmonary disease characterized by dense consolidation of one or more lobes of the lung.

The roentgenological appearance of the lungs in lobar pneumonia varies somewhat in topography depending on the lobe or lobule involved, but the characteristic lesion radiographically follows a rather definite pattern. Early it is seen as a rather homogeneous density, usually beginning peripherally and rapidly extending toward the hilum as a triangular opacity with its base at the

periphery. At times they may initiate with a rather rounded hilar shadow with an irregular border and extend peripherally. These are the so-called central pneumonias, but which have been demonstrated by Ude (12) to be peripheral with their bases toward the mediastinum or the posterior wall of the chest. In addition no small proportion of the pneumonias are visualized behind the heart as increased densities of the normal cardiac shadow due to consolidation of the lung tissue posterior to it as demonstrated by Rigler(13). As a rule, lobar pneumonic consolidation roentgenographically is rather sharply delineated and tends to follow anatomical divisions in its involvement. These factors of anatomical distribution, type of organism, age of patient, virulence of organism and epidemic form, account in a large measure for the variations and atypical features seen in the roentgenogram. Investigative work on animals and roentgenographic study of patients have demonstrated certain correlation between radiographic findings, symptoms and types of pneumonia. These have been of material assistance in prognosis, evaluating serum therapy and clarifying the pathologic process of resolution.

It is apparent from the foregoing that to obtain the greatest diagnostic aid from the roentgenographic methods films must be made early and thereafter serially as indicated. In our series 5 cases showed definite radiographic findings of pneumonia from 6 to 18 hours after onset thus permitting early use of serum. It should also be observed that if the film made early in the disease course is negative to findings, repeated films at regular intervals will establish a diagnosis in most cases in 24-48 hours and determine its extent.

More early diagnoses would probably have been made if all patients with severe upper respiratory symptoms had had an x-ray examination made upon admission. Previously, a considerable number have been admitted with a diagnosis of severe upper respiratory infections, and no roentgenograms were made until increasing severity of symptoms lead to a clinical impression of

pneumonia. At that time diagnosis by the roentgenogram was very definite and it is quite certain that the diagnosis might have been made earlier if x-ray examination had been ordered earlier.

To determine the progress of resolution and above all to aid in--if not actually to establish--the differential diagnosis in threatening clinical complications, the radiographic method stands perhaps unchallenged. Its potential capacity to unravel non-resolution, delayed resolution, abscess formation and pleural effusions, bronchial obstruction, etc. is appreciated. Space does not permit elaboration on the differential features of these complications.

There appear in this department, as in other radiological services, a considerable group of cases where the clinical diagnosis is acute upper respiration infection on account of the symptomatology and the characteristic absence of physical findings. In this group the roentgenogram is of inestimable value and should be the first special procedure requested, as not infrequently lobar pneumonia, bronchopneumonia, influenzal pneumonia or other atypical pneumonic lesions are visualized. Only recently this fall a group of such cases occurred among our staff, in addition to the usual cases more often found among the students. To illustrate these points more completely, three such case histories are appended:

1. \_\_\_\_\_ - male - age 33. In good health until sudden onset of sore throat--adenopathy, malaise, high fever--continued three days--no chest findings. Then productive cough--muco-purulent sputum--temperature 104. Physical Examination: Injected pharynx--very slightly impaired resonance Right base, considered negative.

X-ray examination - Atypical Consolidation, bronchopneumonia.

2. \_\_\_\_\_ - male - age 34. In good health until head cold--malaise and chilly sensations for three days, but continued to work. Two days before admission to Hospital high fever, cough, chills. Physi-

cal Examination: Red throat, perspiration, clear chest.

X-ray examination - Atypical Consolidation--Pneumonia, right upper.

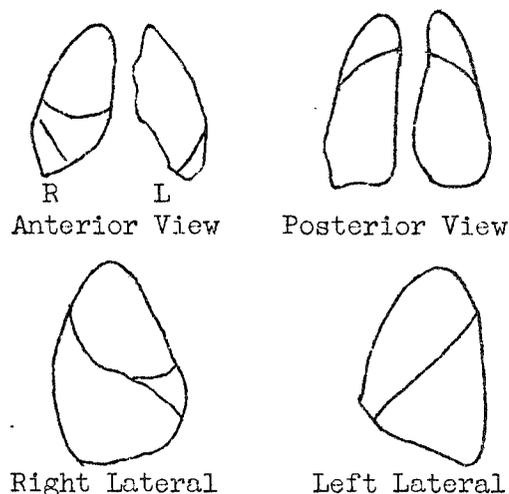
3. \_\_\_\_\_ - male. In good health. Cold followed soon by cough, malaise, perspiration. Pain in chest, especially left side. Physical examination: Indefinite. X-ray examination: Typical Influenzal Pneumonia.

The differential diagnosis of pneumonia has been discussed under bronchopneumonia where the various radiographic findings in each group is considered.

Considerable investigation has been undertaken to distinguish the etiological features of this malady. Blake and Cecil (14) (15) working on monkeys found that pneumococci were innocuous when in the upper air passages. However, once they had passed the larynx, they progressed rapidly down the bronchial tree. The organisms primarily invade the pulmonary tissue at some point or points in the portion of the lobe proximal to the hilum. They then rapidly disperse throughout the lobe by way of the perivascular, peribronchial and septal interstitial tissue and reach the pleura within a relatively short time. This stage, as described by Ude (12), is represented on the x-ray film by a group of soft linear shadows arranged in a triangular manner, separated from each other by the air-containing bronchi. The pneumococci invade the alveolar structure primarily by way of the alveolar walls, subsequently passing into the alveolar spaces simultaneously with the outpouring of exudate into the alveoli. On the other hand, Robertson, cited by Reimann (16), injected pneumococci together with a mucinous substance deep into the lungs of dogs and found that the earliest lesion consisted of an inflammatory reaction in the alveoli where the pneumococci lodged. The organisms then spread by several routes through the interstitial tissue directly by way of the lymphatics and blood vessels, and by contiguity from alveolus to alveolus. Hepatization begins near the hilum and

rapidly progresses to the periphery usually to involve the whole lobe. Coryllos and Birnbaum (17) have tried to show by experiments on dogs that pneumonia is a disease superimposed on a primary pneumococcic atelectases, the type depending on the type of organism found in the exudate which clogs the bronchus and produces the atelectasis. Although a certain amount of atelectasis probably occurs in lobar pneumonia, most authorities do not consider it a primary factor. Terrell, Robertson and Coggeshall (18) have also produced experimental pneumonia in dogs. They found no bronchial obstruction 3 to 6 hours after the onset of the disease and mucous plugs only late in the course of the pneumonia. These authors believe that the slight displacement of the heart and diaphragm often occurring during the course of lobar pneumonia and interpreted by many as an accompanying atelectasis, is probably due to fixation in size of the lung due to the lack of aeration and to the increased elastic tension which Van Allen and Wu (19) demonstrated as occurring in experimental pneumonia. A study of our own cases reveals very little evidence to support the theory that there is any appreciable atelectasis constantly associated with lobar pneumonia. It is true that in occasional cases definite atelectasis is met with, but it appears rather as a complication than as the primary factor in the disease.

In order to better understand the radiological appearance in consolidations of the various lobes, a brief description of the anatomical distribution of the lobes is shown below.



The lungs are divided by deep fissures into three lobes on the right and two lobes on the left side. The major fissure extends upward to the third interspace posteriorly on both sides. On the right it extends downward and forward to the hilum where it divides. One plane extends nearly straight anteriorly to the chest wall, and the other continues downward to emerge at the periphery near the axillary line. The upper lobe on the left corresponds to the upper and the middle on the right. When consolidation occurs, it has a different appearance in the different lobes. The upper lobe on the right will give a dense shadow in the upper portion of the lung field and a sharp horizontal lower border due to the fact that the x-rays are projected nearly parallel with the plane of the interlobar septum forming the lower border of the upper lobe. The middle lobe will have a sharp upper border and a hazy lower border, and the costophrenic sinus will remain clear. In the lateral view it will be seen as a dense triangular shadow with the base on the anterior chest wall and apex at the hilum; the upper border will be straight and the lower oblique. Both lower lobes will show a density of the lower half of the corresponding lung field with a fading out, hazy upper border. The left upper lobe will present a density of the upper lung field with a hazy, ill-defined lower border. Lateral roentgenograms will show the anterior and posterior positions of the upper and lower lobes respectively. It is evident from this consideration that lateral as well as anteroposterior views would be desirable in all cases of suspected lobar pneumonia or in the serial study of such cases. The exact localization of the consolidation could be more easily accomplished and possibly earlier diagnoses made in certain cases. This, however, is not routinely done, largely to avoid the additional disturbance to the patient. Anteroposterior views may be made at the bedside in the supine position with a minimum of discomfort to the patient, but the lateral view does require some movement. Furthermore, the increased expense is a deterrent factor.

It was at one time the opinion of most leading radiologists that although

distribution between right and left sides is nearly equal among the unilobar cases. In the multilobar cases of unilateral type the majority of lesions were on the right side, the total of all cases then showing a majority in the right lung field. It should also be noted that far more lesions occurred in the lower lobes than in the upper and middle lobes. This is in accord with other investigations in this direction. Painton and Ulrich (20) in an analysis of 1,298 cases found the ratio of males to females 3:1. They found most lesions to occur in the right lung and that lower lobe lesions were two and one-half times as common as upper lobe lesions. It can be further seen from the chart that there is a much greater percentage of multilobar lesions diagnosed by x-ray than by physical findings. Herein lies one of the advantages of the roentgenogram in that it more often shows the full extent of the lesion than do the clinical findings. This factor has previously been fully discussed in several papers. Davies, Hodgson and Whitby (21) completed an exhaustive study of 119 cases of lobar pneumonia in which a total of 1,500 roentgenograms were taken serially during the course of the disease and the findings correlated with the physical findings; both antero-posterior and lateral films of the chest were taken. The difference in the 2 types of diagnostic procedure was most marked in Type I pneumonias. There was found to be multiple involvement in 16 of 37 cases of which only 2 were detected by physical examination. They concluded that small and early extensions are far more easily and accurately discovered by x-ray examination than by clinical methods. Reimann (16) states that: "It is often surprising, at the roentgen examination or at the necropsy table, to find the extent of consolidation considerably greater than that indicated by physical signs."

Nineteen of the remaining cases were undiagnosed or diagnosed incorrectly as to etiology or location. These have been tabulated according to the x-ray findings in the following chart. The diagnosis in all instances was clearly evident on the roentgenogram.

#### UNILOBAR BY ROENTGEN EXAMINATION

Lobe	Left	Right
Upper		5
Lower	6	3

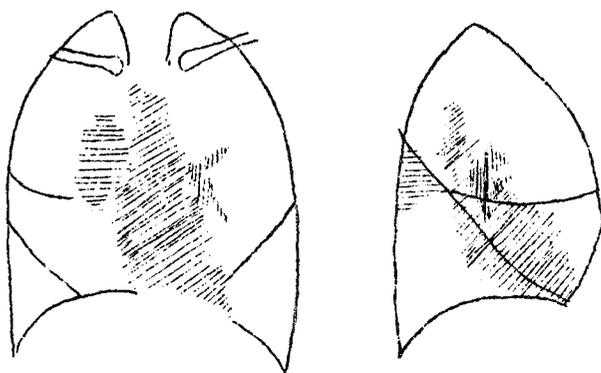
#### MULTILOBAR BY ROENTGEN EXAMINATION

Unilateral		Bilateral
Right	Left	
2		3

The majority of these 19 cases were located either in the left lower lobe or in the right upper lobe. The diagnosis is apparently missed in the upper lobe first because it is somewhat more difficult to examine and second because, as Belden (22) points out, only partial consolidation is apt to occur in this region. With only partial consolidation, physical signs may be nearly completely absent. This Mason (23) attributes to the fact that bronchial breath and voice sounds are dependent on the presence of a medium of comparatively uniform density from the site of their origin (the trachea and large bronchi) to the point where the ear or stethoscope is applied. This condition is, therefore, not fulfilled when normal lung tissue intervenes, and signs may be few. The lesions in the left lower lobe are missed because they are often behind the heart where the physical findings are masked. On the roentgenogram these lesions can be seen due to the increased density of the left side of the heart provided the film is sufficiently exposed to penetrate through the heart shadow.

There were also 9 cases of pneumonia diagnosed clinically in which vague signs pointed to a lesion in one side of the chest or the other, but a correct diagnosis as to lobar distribution could not be made except by roentgen study, the results of which were as follows:

the demonstration of a triangular area of consolidation is frequently the earliest roentgenologic finding in lobar pneumonia, there were cases of central or hilar pneumonia which never assumed a cone shaped distribution. Ude (12), however, quite conclusively demonstrated the fallacy of this supposition in a series of 120 cases in which both lateral and anteroposterior examinations were done. He showed that the term "central" or "hilum" pneumonia is a misnomer and that this is merely a matter of projection. Authors describing the hilar type had not used lateral roentgenograms and, therefore, had not discovered that the hilar pneumonia is really an early posteromedial pneumonia located in the superior portion of the lower lobe. The following diagram presented by Rigler (13) clearly depicts the true position of a consolidation seen in the hilar region on anteroposterior films.



Reimann (16) discusses the problem of the central or peripheral origin of lobar pneumonia. It is his opinion, based upon the roentgen studies in the lateral and anteroposterior positions and on observations at autopsy, that only rarely is a consolidation limited to the region near the hilum as a genuine central pneumonia. He states that: "In man roentgenologic and post mortem evidence shows that lobar pneumonia may commence anywhere in the lung, but most frequently in the peripheral areas."

During the two year period, 1936-1938 we reviewed 96 cases of lobar pneumonia which represented nearly all of those admitted to this hospital on the various services, including the Health Service.

The median age of the group was 23. Fifty-two were males and 44 females. Twenty-six fell between the ages of 18 and 23 inclusive, and 14 were 5 years or under. Thirty-one were patients in the Health Service. The same difficulty was encountered in this group as in the others, namely, that the clinical records on a considerable number were incomplete. However, they were carefully studied and credit given for correct clinical diagnoses when indicated. Fifty-six of the 96 were admitted with a diagnosis of pneumonia, 18 with a diagnosis of upper respiratory or bronchial infections, and 22 were admitted with miscellaneous diagnoses. Some of those not diagnosed as pneumonia were incorrect diagnoses and others developed pneumonia after a varying hospital stay.

There were 60 cases in which the clinical and x-ray diagnoses exactly coincided or in which the clinical diagnosis was correct, but did not show as extensive a lobar involvement as the roentgenogram. The following chart shows a tabulation of these cases.

Lobes	<u>UNILOBAR CASES</u>			
	Clinical Diagnosis		Roentgen Diagnosis	
	Left	Right	Left	Right
Upper	2	5	2	5
Middle		4		2
Lower	19	22	17	16
Total	21	31	19	23
Total Cases	52		42	

Localization	<u>MULTILOBAR CASES</u>			
	Clinical Diagnosis		Roentgen Diagnosis	
	Left	Right	Left	Right
Unilateral	1	3		13
Bilateral		4	5	
Total	8		18	

It can be seen from this chart that the

CLINICAL DIAGNOSIS WITHOUT LOCALIZATION

<u>Lobes</u>	<u>Left</u>	<u>Right</u>
Upper		2
Lower	3	3

There was also 1 case of bilateral multilobar distribution

The remaining 8 cases fell in a considerable variance in diagnosis. cellaneous group where there was con-

MISCELLANEOUS

<u>Clinical Diagnosis</u>	<u>X-ray Diagnosis</u>	<u>Post Mortem</u>
1. Bronchopneumonia	Lobar - LL, RM, RL	Bilateral bronchopneumonia 2 days after x-ray film.
2. Lobar - RL	Bronchopneumonia - right	
3. Lobar - RU, RL	Encapsulated empyema	Bronchopneumonia
4. Lobar - LL	No film made	
5. No Diagnosis	Bronchopneumonia	
6. Metastases	Lobar - LL	
7. Bronchopneumonia	Lobar - RL, LL	
8. Lobar - LL	Bronchopneumonia	

It will be seen from the above chart that the 2 cases coming to post mortem in this group bore out the x-ray diagnosis. Twelve autopsies were done in this series of lobar pneumonic cases, includ-

ing the 2 referred to in the above chart of 8 cases. The findings are tabulated in the following chart.

AUTOPSY FINDINGS IN LOBAR PNEUMONIA

<u>Clinical Diagnosis</u>	<u>X-ray Diagnosis</u>	<u>Post Mortem</u> <u>Diagnosis</u>
1. RL, RM lobes	RL, RM lobes	RL, RM lobes
2. RL lobe	RL lobe	RL lobe
3. RM lobe	RM lobe	RM lobe
4. RL lobe	Bronchopneumonia	Bronchopneumonia
5. Lobar Pneumonia	Bronchopneumonia	Bronchopneumonia
6. LL lobe	LL lobe	Bronchopneumonia
7. Sepsis	RU lobe	RU lobe
8. RM lobe	RM, LU lobes	RM, LU lobes
9. RM, RU lobes	RL lobe	RL lobe
10. RL lobe	RL lobe	RL, RM, RU lobes
11. LL lobe	LL lobe	LL, LU lobes
12. Rt. lung. No localization	RU lobe	RU, RL lobes

It can be seen from the above chart that the post mortem findings were in complete agreement with both the clinical and roentgenologic findings in the first 3 cases. Post mortem findings in the next 2 cases showed bronchopneumonia which was in agreement with the roentgenologic findings while the clinical diagnosis was lobar pneumonia. In the 6th case both the diagnosis from the x-ray examination and physical findings was lobar pneumonia while the autopsy showed bronchopneumonia. Of the remaining 6 cases the roentgenologic diagnosis was correct or more nearly so in 4. Three cases showed more extensive lobar involvement at autopsy than was indicated on the roentgenogram. However, it should be mentioned that 2 to 6 days elapsed between the last x-ray examination and the autopsy, which probably accounts for the discrepancy. In this small number of proved cases, it is obvious that the roentgen diagnosis was more often correct than the clinical diagnosis and that it more frequently showed the true extent of the lesion.

No definite note could be found in the literature regarding a study to determine how early after the onset of symptoms an x-ray diagnosis could be made. Graeser, Wu Ching, and Robertson (24) present 3 cases diagnosed under 30 hours. Mason (23) describes 1 case in which there were no findings 5 hours after onset. Reimann (16) states that a typical case of lobar pneumonia gives a density demonstrable on a roentgenogram somewhere between 12 and 18 hours after onset. Terrell, Robertson and Coggeshall (18) in studying microscopic sections of the dog's lung found definite signs of consolidation 6 to 12 hours after the introduction of the pneumococci. In our group 19 cases were found in which a diagnosis was made in less than 30 hours, and in which the time could be quite accurately determined from the onset with a shaking chill. Seven of the 19 were of less than 24 hours duration as seen in the following chart.

	<u>X-Ray</u> <u>Diagnosis</u>	<u>Clinical</u> <u>Diagnosis</u>
1. Less than 24 hrs.	RL, RM	No physical signs
2. Less than 24 hrs.	LL	LL
3. 18 hours	LL	Pneumonia. No localization.
4. 18 hours	RM, RL	RM, RL
5. Less than 14 hrs.	RM	RM
*6. Less than 9 hours	RL	RL
*7. 6½ hours	LL	Questionable signs interpreted as acute pleurisy.

In all 7 of the above cases the diagnosis could be made without question by x-ray examination, even in the one of 6½ hours' duration. The case histories of the 2 cases starred in the above chart are as follows:

\_\_\_\_\_ - male - age 18 - Type 9. Upper respiratory infection for 1 week. At 2 P.M. had a chill and pain in the lower right chest. This was most marked on deep inspiration. No cough nor hemoptysis was present. The lungs were resonant throughout. Few rales were noted at the right base on deep inspiration and after coughing. An area of increased density in the right cardio-phrenic **angle was demonstrated on x-ray examination 9 hours after the onset of symptoms.**

\_\_\_\_\_ - male - age 19 - Not typed. Discharged 1 month before, after severe influenza infection. One week before admission developed upper respiratory infection and stayed in bed for several days. He then went to school and at 4:30 P.M. had a shaking chill. At 5:00 he began to cough and raise sputum (no blood). Shortly afterwards he developed a

sharp, stabbing pleuritic pain in the left lower chest. There was no change in the percussion note. Breath sounds were equal on both sides with no alteration in character. Rough friction rub in the lower left axilla and an occasional subcrepitant rale in the same area. Diagnosis Clinically: Acute pleuritis with possible early pneumonia. X-ray examination at 11 P.M., 6½ hrs. after onset of symptoms, showed a definite area of increased density in the region of the left lower lobe.

In our series there were not enough cases of any one type to determine whether or not there is a characteristic picture for each type of pneumococcus. Belden (22), however, reports that there is none although if a consolidation is seen in the upper lobe, there is a 75% chance that it will be Type IV. Chills seemed to be the prominent symptom in this group, but Painton and Ulrich (20) in a much larger series found dry cough the most common (73.7%), then pain (61.1%), and then chill (33.2%).

In most instances not having serial films taken through the course of the disease up to complete resolution, we could not draw any conclusions concerning serum therapy, rapidity of resolution, etc. Davis, Hodgson and Whitby (21), however, were able to do so. They found that patients infected with Type I pneumococci and treated with serum had an early crisis, 4 to 5 days on the average. The consolidation as seen by x-ray examination nevertheless continued to show progression, reaching its maximum density on the 7th day. In our own experience this is not always true, resolution occurring in some cases more quickly than the average period needed for resolution. Furthermore, they believe the denser the opacity of the roentgenogram the greater the severity of the disease and the slower the resolution; also that a rapidly forming consolidation tends to resolve rapidly while a slowly forming one tends to resolve slowly and often ends in a varying degree of permanent fibrosis. In addition it seemed true that resolution was delayed in those with calcified hilar glands and chronic pulmonary disease.

During resolution the lobe clears first at the periphery and proceeds toward the hilum. Often during the stage of resolution, small cavities are simulated. Terrell, Robertson and Coggeshall (18) showed these to be due in dogs to dilated atria or air sacs, the dilatations tending to persist longer than the other changes in the consolidated lung.

## CONCLUSIONS

### 1. Pulmonary Infarcts

The roentgenological appearance of pulmonary infarcts in most cases is characteristic and typical findings are diagnostic. A negative x-ray examination does not rule out their presence.

The distinction between bronchopneumonia and infarcts is often difficult and clinical impressions should be correlated with the roentgenological findings before arriving at a final diagnosis.

### 2. Bronchopneumonia

The x-ray examination in bronchopneumonia is not an infallible procedure. If the findings are definite and distinct and the roentgenogram is not clouded by pleural or severe cardiac disease, the diagnosis can be made quite definitely by the roentgenogram.

If other conditions such as pleural effusion or pulmonary congestion are present, the x-ray findings should be accepted only if they are closely correlated with the clinical picture.

### 3. Lobar Pneumonia

Lobar pneumonia can be more often correctly diagnosed by x-ray examination than by clinical findings.

The true extent of the lesion is better shown and early extensions more easily and accurately determined by x-ray examination.

Lobar pneumonia may be diagnosed by x-ray examination in less than 10 hours in some cases and serum treatment thus

instituted at an earlier date.

In case of a discrepancy between the physical findings and the x-ray examination, the latter should be accepted as more nearly correct.

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VI. DIAGNOSTIC ROENTGENOLOGY REPORT - July 1, 1937 to June 30, 1938

<u>Parts Examined</u>	<u>Hospital</u>	<u>Out- Patient</u>	<u>Health Service</u>	<u>Miscel- laneous</u>	<u>Totals</u>
Abdomen	610	126	5	13	754
Ankle	80	154	40	20	294
Bladder	13	14	1	10	38
Bronchography	18	38	1	2	59
Cervical spine	65	133	15	20	233
Chest	3117	2369	3864	584	9934
Cholangiography	30	25	4	1	60
Clavicle	15	25	3	9	52
Coccyx	1	22	3	3	29
Colon	186	596	36	81	899
Cystogram	48	23	1	1	73
Elbow	101	98	13	22	234
Encephalogram	70	0	0	1	71
Esophagus	106	79	38	15	238
Femur	198	111	4	28	341
Fluoroscopy	697	1730	232	198	2857
Foot	60	129	15	19	223
Gall Bladder	150	782	11	56	999
Hand	67	122	16	32	237
Heart	252	102	64	26	444
Hip	138	132	5	10	285
Humerus	179	69	2	10	260
Hystero-salpingography	3	0	0	0	3
Injection of fistulae	1	0	0	0	1
Knee	129	250	12	17	408
Liver and Spleen (Thorotrast)	17	7	12	4	40
Lumbosacroiliacs	191	621	56	68	936
Mandible	40	59	2	7	108
Mastoids	114	161	0	7	282
Maxilla	7	10	1	0	18
Miscellaneous	50	41	2	7	100
Myelography	1	0	0	0	1
Neck and Thyroid	75	50	2	4	131
Nose	2	5	3	3	13
Orbits	26	24	3	1	54
Pelvis	186	423	9	56	674
Pregnancy	41	24	1	3	69
Radius and Ulna	79	54	2	8	143
Ribs	19	33	34	9	95
Sacroiliacs	4	37	5	4	50
Sacrum	7	26	8	4	45
Scapulae	5	15	0	1	21
Sella Turcica	17	33	9	3	62
Shoulder	115	178	25	20	338
Sinuses (Paranasal)	120	527	12	37	696
Sinuses (Para.) Iodized oil	9	12	1	1	23
Skull	316	320	21	47	704
Sterno-clavicular joints	1	7	3	0	11
Sternum	10	1	11	5	27
Stomach and duodenum	277	1250	177	133	1837

(Continued on Page 158)

DIAGNOSTIC ROENTGENOLOGY REPORT - July 1, 1937 to June 30, 1938 (Cont.)

<u>Parts Examined</u>	<u>Hospital</u>	<u>Out-Patient</u>	<u>Health Service</u>	<u>Miscellaneous</u>	<u>Totals</u>
Temporo-mandibular joints	1	6	0	2	9
Thoracic spine	105	180	22	22	329
Tibia and fibula	223	153	4	10	390
Urinary Tract	319	983	17	80	1399
Urography, intravenous	193	374	10	41	618
Urography, retrograde	63	153	0	26	242
Ventriculography	27	2	0	0	29
Wrist	63	105	13	19	200
<b>TOTALS</b>	<b>9057</b>	<b>13003</b>	<b>4850</b>	<b>1810</b>	<b>28720</b>

ANALYSIS OF YEARLY REPORT AND COMPARISON WITH PREVIOUS YEARS

	<u>Distribution of Cases</u>		
	<u>1935-36</u>	<u>1936-37</u>	<u>1937-38</u>
Hospital	35.6%	33.5%	31.5%
Out-Patient	42.0%	45.9%	45.3%
Health Service	16.0%	14.3%	16.9%
Miscellaneous	6.4%	6.3%	6.3%

Special Types of Examination

	<u>1935-36</u>	<u>1936-37</u>	<u>1937-38</u>
	<u>No. of Cases</u>	<u>No. of Cases</u>	<u>No. of Cases</u>
Chest	8122	8529	9934
Bronchography	87	112	59
Cholangiography	61	61	60
Colon	572	803	899
Gallbladder	852	1074	999
Stomach	1662	1882	1837
Urography Intravenous	359	593	618
Urography Retrograde	227	235	242
Encephalography	25	44	71
Ventriculography	21	21	29

Comparison of Roentgen Examinations with Number of Patients

	<u>1935-36</u>	<u>1936-37</u>	<u>Increase</u>	<u>1937-38</u>	<u>Decrease</u>
Hospital Admissions	8,496	9,216	8.3%	9,186	.3%
X-ray Cases	8,892	9,188	3.3%	9,057	1.4%
Out-Patient Visits	92,626	94,382	1.7%	96,082	Increase 1.7%
X-ray Cases	10,479	12,484	19.1%	13,003	4.2%

General Increase in Roentgen Examinations

	<u>1935-36</u>	<u>1936-37</u>	<u>1937-38</u>
Number of Cases	24,941	27,310	28,720
Increase		9.5%	5.2%

COMMENT

The continued increase in the work of the department has necessitated further accommodations of space and purchase of new equipment. The lack of sufficient clerical and technical help is a great handicap. The demands for special x-ray service are increasing without any proportionate increase of personnel. Likewise the demand for x-ray films for clinics is requiring a larger and larger proportion of the time of the department clerks. Note should be made of the rules for removing films from the department which are attached hereto.

It is interesting to observe the close correlation between hospital cases and x-ray examinations. This, however, is much less marked in the out-patient department in which the number of x-ray examinations continues to increase out of proportion to the increase in number of patient visits.

The increase in such procedures as intravenous urography, bronchography, cholangiography, and cerebral pneumography have added greatly to the work of the department. During the past year these appear to have leveled off somewhat, but new procedures such as kymography and tomography may tend to again increase our work disproportionately. All of these procedures are time consuming and expensive.

Attention of the permanent staff is called to these figures because of the fact that increased expenditures in the x-ray department tend to limit the number of patient days. Any precautions by which the number of these examinations could be limited or reduced should be invoked to the fullest degree. Any further increase in the number of x-ray cases will imperatively necessitate either a complete reorganization of the department both as to physical plant and personnel or a definite limitation in the number of cases done per day.

L. G. Rigler

VII.

REMOVAL AND RETURN OF ROENTGENOGRAMS

## X-RAY DEPARTMENT

Because of the great difficulties encountered in procuring the return of borrowed x-ray films to our department promptly, the following notice is being promulgated:

X-ray films are permanent records, valuable in themselves and important for permanent possession. Furthermore, they should be available at all times to anyone on the staff who may be interested in the particular case that they represent. If films are removed from the x-ray department they immediately become unavailable to anyone but the individual who has taken them, and, therefore, should be removed for the shortest possible period of time. Great care must be exercised in returning them promptly and completely. In order to facilitate this matter may I call your attention to the following rules; these apply to the permanent members of the staff as well as to the interns and fellows.

1. No films should be removed from the x-ray department without notifying the clerk in the department and signing on the sign-out sheets which are available.
2. Films must not be removed from the wet film viewing room except for use in the operating room. Permission must be obtained from one of the x-ray staff.
3. Anyone removing films is held personally responsible for them.
4. Films should not be taken out until shortly before they are to be used. Likewise they should be returned to the department immediately after they have been used; for example, if a clinic is held in the afternoon the films must be returned on that same afternoon and not retained until the next day.
5. Lists of films to be borrowed for clinics must be in the hands of the clerk at least 12 hours before they are to be used.
6. Nurses on the floors are not responsible for returning films which have been taken out by interns, fellows, or other members of the staff. The

individual who removes the films is responsible for returning them. Care must be exercised to return all the films in each case.

7. Films removed for the purpose of making reproductions must be returned within a reasonable time. It is noted that six months is not a reasonable time. It should not take longer than one or two weeks for any photographic or other procedure to be made. The films should not be taken out until the photographer is ready to start work upon them. The removal of large numbers of films for long periods of time is strongly against the interests of the entire staff.

8. In handling films for photographic or other purposes ink or other irremovable materials must never be used, as these may ruin the films permanently for any other use. Wax pencil serves just as well and may readily be removed. Please see that envelopes are also returned with films as these have valuable information upon them.

These rules are promulgated not only to relieve the clerical service of the x-ray department, which is now tremendously overburdened, but also for the benefit of the staff itself. Members of the staff who may wish to use certain films some time in the future are harmed just as much by the loss of these films as is the staff of the x-ray department.

Leo G. Rigler, M.D.

VIII. GOSSIP

Monday, December 12, en route to a Medical and Public Health Meeting at Moorhead, Minnesota. On Friday I am reminded that I have two talks to make on Monday. The one on the Postgraduate Medical Program at Minnesota is not difficult; the other on Present Day Knowledge of Cancer presents the same problem as of old. For a change I am in plenty of time for the train. I wonder who numbers the cars and what system is followed. I am in B7 which should be next to B6, but it is not. As the Pullman is in a state of confusion I deposit my belongings and go back to the Club Car. The early morning drinkers are there looking with bleary eyes on the cup which is supposed to cheer. They are soon joined by the boys who will take a drink at any time. A passenger is already tinkering with the radio trying to get music instead of the continued stories. He is successful, but the music is hymns, which makes our other friends feel worse. Times have changed, for the radio now has a special direction booklet on how to start and stop the machine and tune out excessive noise. The system is charted to the coast indicating available programs along the way. The train moves on in the frosty morning air, but we are warm inside. We go on a siding and of all things, we are passed by a fast mail. Later we yield to a freight, which in turn must yield to another freight from the opposite direction. There are two types of towns -- prairie settlements with the proverbial elevator, and railroad towns with their busy switching and track storage. A row of superannuated locomotives are hitched together from the oldest to the most recent edition. Boys wonder how much it would cost to buy one. I know that I did. The prairie towns have striking names for we have just passed one named for the famous Ignatius Donnelly. From its appearance it has never justified its distinguished name. We have just left Herman where Moses Barron was brought as a small boy to live on a farm. He remained here until he reached his maturity. I wonder if Mose developed his vocal apparatus calling across the flat country. I almost wondered if he practiced hog calling. On second thought this is not so good. After Breckenridge the train finds

itself in North Dakota, but after a few miles comes back to Minnesota, probably feeling that there will be enough of this later on. I finish "Black Is My True Love's Hair." I will not give away the ending, for after many pages of expecting her lover to return to carry out his threat to kill her, it would be an anticlimax to tell. If this was from "Tonics and Sedatives" I would say that I read the book, but I must confess that this is my third effort to finish it. Grantland Rice's All-American Selection in Collier's bores me, as Minnesota has no representatives. In fine print I find the names of some of our stalwarts listed under those who have been considered. It is nearing noon, and the boys are getting anxious for the signal from the diner. All wait a few minutes before going in with the result that all arrive at the same time. This is an unusual dining car, for it sings. It is the most striking noise I have ever heard. Accustomed to the usual pitching and tossing, this is a new sensation. Every piece of silver in the place is in a state of fine tremor. The waiter confides in me that this car is drawn on every tenth trip by this crew and has been singing ever since it was made, even though it is systematically put on the pit to take out the vibration at the end of each trip. Remembering G. K. Chesterton's Impressions of America, in which he said the most interesting people he met were porters and waiters on trains, I asked my waiter if he liked chicken a la Maryland. He told me that chicken a la Maryland was just chicken with gravy on it, and very few chefs knew how to make it. He did not like chicken and dumplings because so very few chefs knew how to make dumplings. Breaking down, he finally told me that he considered southern fried chicken the most toothsome dish. Further questioning revealed that southern fried chicken was just fried chicken. As a result I ordered chicken pie. For desert he brought me pie and a fresh crock of cheese with a spoon inserted at such an angle that quite a good sized piece had to be lifted before the spoon could be released. After lunch, I read the expensive magazines in the Club Car. The only other chance I have to do this is when I

attend a Committee Meeting at the Minneapolis Club. I have just spotted Hugh Cabot's wedding announcement. His address is given as Boston and Rochester, Minnesota. Here is an article by Elsa Maxwell. She describes her visit to Minneapolis, where she drew a good laugh by referring to the Twin Cities as "Demon and Pythias." The ministers in the Minneapolis audience were disturbing until she noted that they laughed at the right time and with proper gusto. And now her article gets more interesting, for I have her own words for this statement -- "In entertaining, if you must have bores, put them all together at the same table and they instantly become the life of the party." Saturday night I was at a dinner where our table made the most noise and seemed to have the most fun. I am wondering if the hostess read this article. This was an unusual party. There were 36 of us, and, after dinner up popped a master of ceremonies. A floor show in the amusement room with various and sundry remarks about the guests provided much merriment. After the show, the entertainers reappeared dressed in more gorgeous finery than any of the guests. It was much easier to do the Lambeth Walk with these sprightly young things scattered through the crowd. A certain well-known newspaper columnist urged me to Shag and Shine. But that is another story. We are nearing Fargo and I prepare to leave. My destination is the Fargo Clinic where my host, former regent O. J. Hagen, is waiting. After walking 6 blocks in the wrong direction, I change my course and finally arrive at his office. The Fargo Clinic is an amazing institution, representing an investment of over \$100,000.00. A good sign is the large number of young men with their walls filled with degrees, advanced degrees, special society memberships, and American Board certifications. From one of the older men I hear the story of a trip to Greece, from another praise for the Center for Continuation Study, which is good music to my ears. The head technologist wonders if I remember when last we met. I assure her without faltering it was 1924, which brought confusion as it happened to be the right date. We are now driving to Dr. Hagen's home in Moorhead to don our vestments. His home is a place to remember. All who have visited it re-

turn whenever the opportunity presents itself, because of the unusual brand of hospitality which is dispensed. At the Medical Meeting at the Hotel a goodly number are present from Clay and Becker Counties. My dinner partner is a recently elected member of the legislature who is anxious to hear what it is like in St. Paul. He told me that he had only made two speeches during the campaign relying on singing old-fashioned songs over the radio to win his votes. Eventually we got around to the subject of chicken, but he told me that farmers (he was a farmer) are very tired of chicken and he preferred a piece of salt meat, which is becoming scarce in these days of artificial refrigeration (community lockers). I told the group of the program at the University, which seemed to interest them. All of our "former students" gave a hearty Amen to my remarks, which I must tell my wife when I return. She assures me in my enthusiasm I say many things which are almost true, and she shudders whenever anyone comes to find out what it is all about. Many old students in the audience ask about changes at the School. The usual skimpy crowd is present at the Junior High School to hear the Cancer talk. It is a most uninteresting subject to those who should be interested. Public health leaders have learned the danger of trying to attempt special public health meetings preferring to use organizations already assembled for another purpose. The school building is a revelation, being newly constructed in modernistic style. It is the most "unlike" school building I have ever seen. Wall and ceiling - sound treatment, broadcasting device for all the rooms from a central station, special art rooms, unusually well-equipped science rooms, a perfect theatre, and enormous gymnasium divided by a solid curtain, and a domestic science unit that looks just like the pictures in the book. A model apartment for teaching bed making and other useful household arts was a complete surprise. And, believe it or not, they had drying rooms for the dish cloths and towels, and a complete laundry unit. A little library, like a small university

unit was next to a sewing room with cubicles for fitting dresses. Special rooms for students who brought their lunch, special rooms for band practice, special rooms for debate rehearsals, but enough of this. At a late hour we re-assembled at Dr. Hagen's home where good friends waited, and a hearty "Norske torske" spread was served. At midnight my train departed, and in the morning I was back to reality and another day at the University, to write these words of greeting to you and to wish all a joyous Holiday. All who have taken part in the programs this fall have exceeded our fondest expectations. Especially to be commended was the promptness in getting in the manuscripts and the excellence of the extemporaneous delivery of the reports. We hope that the standard which has been set will be continued throughout the balance of the year.

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## SURGICAL DEPARTMENT CHRISTMAS PARTY

Thursday, December 22, 1938  
 From 3:00 to 6:00 P.M.  
 In Lounge of Powell Hall

All members of Surgical Department  
 are invited - physicians, nurses, etc.

Please bring 10¢ gift.

Committee.

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