VOL. II THURSDAY, MARCH 12, 1931 NO. 22

GENERAL STAFF MEETING
UNIVERSITY HOSPITALS

CONTENTS

PUBLICATION FINANCED BY CITIZENS AID SOCIETY

ANNOUNCEMENTS:

1. Clinical pathological conference.
Hodgkin's disease, Friday, March 13th at 11 A.M. Todd Amphitheater.

2. Follow-up.
One of our patients (not former patient) received questionnaire from Dr. L. G. Erickson in regard to condition of skin following treatment for malignancy. He stated, "Dear Doctor: Your kind letter was addressed to another man so I received it open. It was very interesting to me that your efficient system followed up the case. I feel it my duty to appear for a final diagnosis and I hope to be of some service for efficient and excellent work at the University Hospital. Expressing my sincerest appreciation, I remain, Very loyally a true booster for the University of Minnesota." A good follow-up system has been called an autopsy (intravitam). While the patients are in the hospital we are only seeing one phase of the illness. What happens afterward is just as important from every standpoint as the hospital phase. Clinical follow-ups should be stressed as much as autopsy follow-ups. When immediate contacts are made, the results are much better than writing letters to patients who have been here years ago. Another man interested in carcinoma of the lip sent out a large number of letters and received only a small handful of replies because of the elapse of time and apparent lack of interest on our part.

3. Clinic.
The Minnesota State Medical Association meets in Minneapolis the evening of May 4th (Monday), and all day Tuesday and Wednesday, May 5th and 6th. The University of Minnesota has been asked to contribute to the program. A series of clinics will be held at the hospital and medical school Tuesday afternoon, May 5th, from 1:30 to 5:30 P.M. It is hoped that everyone will make a special effort to make this a real event. It is an unusual opportunity for us to let the profession know what we are doing. If everyone prepares his clinic as well as was done for the meeting of the American College of Physicians, it will be a great success. The clinics are to be 30 minutes in length, and will be held in the Todd and Eustis Amphitheaters, the Anatomy Amphitheater and probably in the Botany Amphitheater. In this way it will be possible for visitors to attend the clinics they desire to hear, and will probably mean that the groups will be smaller (and more effective). It was obvious at the meeting of the American College of Physicians that the men who really prepared their clinics well in advance made a good impression. Start now, and even though you are not asked to give material, be on hand to give everybody a royal welcome.

4. April Sixth.
The University Hospitals have been invited to give one of their staff meetings at the regular monthly (evening) meeting of the Hennepin County Medical Society on this date. Plans are under way to make this a deluxe affair and it is earnestly requested that everyone write down the date in his appointment book today. A full attendance is desired and every intern with the exception of those absolutely necessary for the conduct of the institution during the hour, are expected to be present. The same, of course, is true of staff men and fellows. We hope to have the material well prepared in advance so that everyone will know the part he is to play. Arrangements will be made to take those who do not have transportation down to the Medical Arts Building. Prior to the meeting a few slides will be shown with an explanation given of our staff meetings. This is in order to create an atmosphere.

5. Notes.

Many have commented on the complete progress notes which are given in the case reports. You may be interested to know that much of this material is obtained from nurses notes. The ideal daily progress sheet should include a record of the temperature, pulse and respiration (in addition to graph), medication, new orders, notes concerning laboratory specimens sent and received, note as to consultations requested and completed, nurse's notes and staff notes. In this way it would be very easy for the staff to get in the habit of reading the nurses' notes for each day. In private practice, reading the chart while visiting patients is usually done.

6. Thank you.

We greatly appreciate your cooperation in giving a trial to the new arrangement of eating upstairs and thinking downstairs. It has been observed that we have eaters, thinkers, and eater-thinkers. The absence of certain interns is noticeable. We hope this is due to unavoidable circumstances occasioned by staying with sick patients. The persons who conduct the staff meeting were guilty of attempting too much material and persistent effort is being made to keep it down to the one hour limit so that time is available for discussion. This is the most important part of our meeting and any suggestions for improvement will be appreciated. Again we thank you for your hearty cooperation and splendid assistance in making these meetings a success. Our only purpose "To Mould Opinion and Shape Policy". For this reason everyone should come.

7. Memorial Lecture.

Through the generosity of the Citizen's Aid Society we are to have an annual lecture on malignancy. We have secured Dr. George Gray Ward of New York to talk on Cancer of the Uterus. This will be delivered before the Tuesday morning (May 5th, 11 A.M.) session of the Minnesota State Medical Association at the Nicollet Hotel. It will be followed by a clinic in the afternoon at the hospital.

8. Born.

A son (Wade Wellington) to former medical fellow K. K. Sherwood and Mrs. Sherwood February 26, 1931. Congratulations!

II. SPECIAL ABSTRACT:

Eller, J. J. and Anderson, N. P., Cancer Supervention in Skin Diseases: Clinical Microscopic and Therapeutic Considerations. Brit. Jour. of Derm. and Syphilis XLII (263-289) (June) 1930.

"The importance of the early recognition of the various types of cancer has always been emphasized. This is due to the fact that the percentage of cures can be raised considerably when malignant tumours are treated radically at their inception. If this be true, it should also be important to recognize the pathological conditions which may be forerunners of cancer and to eradicate them. In this paper the writers endeavoured to show, as a result of their own investigations, as well as those of other workers in the dermatological field, that there are over twenty skin conditions which may be forerunners of cancer. These are as follows:

Syphilis (Tertiary)
Radio-dermatitis (X-ray, radium)
Leukoplakia (Mouth)
Moles (also malignant lentigo, melanotic whitlow).
Senile and seborrhoeic keratoses.
Lupus erythematosus.
Chronic ulcers (varicose ulcers, pellagrous ulcers, fistulae, etc.)
Paget's disease of the nipple.
Cicatrices (also burns).
Cutaneous horns.

Kraurosis vulvae.
Occupational keratoderma (tar, pitch, arsenic, dust, oil, heat, etc.)
Lupus vulgaris and tuberculosis cutis.
Arsenical keratoses.
Sebaceous cyst.
Bowen's disease.
Extramammary Paget's disease.
Papilloma of tongue.
Xeroderma pigmentosum.
Blastomycosis.
Inflammatory dermatoses (psoriasis, lichen planus, eczema).
Keratosis follicularis.

Comment:

While all of the preceding lesions vary in frequency as to malignant development, our attitude should not vary. Because of the remarkable co-operation between services, none of these conditions should go untreated, e.g., the Dermatology Division is anxious to see all skin lesions, and consider it a favor when asked to do so. It is up to the rest of us to take advantage of the opportunity afforded by this and other services.

III. CASE REPORTS:

1. CHRONIC PNEUMONITIS, PLEURITIS, MEDIASTINITIS, PERICARDITIS (INTRA-THORACIC ACTINOMYCOSIS).

The case is that of a white youth, 12 years of age, admitted to the University Hospital 9-25-30 and died 1-19-31 (96 days).
1929 - (Summer) - Bronchopneumonia - 6 - 8 weeks.
1930 - Fatigue all summer. Had paper route. Too tired to play.
July - Pain in right side. Daily fever of 101 to 102 . In a few weeks he had a productive cough with foul yellor sputum - oz. 1 daily. Precordial pain lasting 20 hours. Frequent epistaxis. Poor appetite. Chest negative on physical examination. X-ray Chest - questionable scar at right base. Widal positive 1-50. No rose spots, no splenomegaly, no T. B. in sputum. Von Pirquet negative.
August - Chest X-ray - Density at right lower base. WBcs 20,000, Pmns 70. Urine negative. Widal positive 1-200. Appetite poor. Parents allowed child up. B. Mellitensis and abortis negative.
September 11 - Dullness at right base. Increased breath sounds anteriorly and posteriorly. Later decreased breath sounds.
September 22 - Increased cough. Suggestion of precordial friction rub. Pulse 150. Heart examined by physician. Said to be negative.
September 25 - Entered University Hospital with same complaints as given above. Physical Examination: Acutely ill white male child with flushed cheeks and dry, warm skin. Head and neck - a few carious teeth present. Submaxillary glands palpable. Chest - Lagging of right chest, slight bulging of precordium. Litten's sign absent on right. Lungs - Tactile fremitus absent below 3rd interspace anteriorly and below angle of the scapula posteriorly. Breath sounds and vocal fremitus absent over right base. Heart - Diffuse apex beat. Dullness to left anterior axillary line. Saccular type of enlargement. Definite precordial friction rub. Abdomen - Liver palpable 2 fingers below costal margin.
Laboratory - Hb. 60%. RBcs. 4,060,000, WBcs 22,050. Pmns 86, L 13, M 1. Blood culture negative. Mantoux 1 - 100 negative. Urines - (99 different specimens essentially negative except for occasional red and white). Pleural fluid - (Thoracentesis) - clear, greenish, yellow fluid. No coagulation. Sp. gravity 1014. Cells 17,580. L 70, Pmns 30. No bacteria. Guinea pig innoculation negative.
X-ray Bilateral pleural effusion. Cardiac enlargement - undetermined type. Ice cap to pericardium. Codeine P. R. N. for cough.

9-26-30 Transfusion of 250 cc. citrated blood. Blood culture negative. S. S. enema good results. P. 80-130. T. 100-102..
9-27-30 T 104. Friction rub less marked. Pain in abdomen.
9-29-30 Friction rub disappeared. Chest x-ray Smaller amount of fluid on the right than before. Otherwise same. T. 100.6-101.6.
10-2-30 Hb. 75% (60% before transfusion). WBcs 17,700, RBcs 4,180,000. P 67, L 23, M 8, E 2. Thoracentesis - culture and guinea pig innocculation negative. Mantoux 1-200 negative.
10-3-30 Chest x-ray Slight decrease in effusion on right; otherwise same as 9-29-30. Transfusion of 250 cc. blood. Comfortable.
10-6-30 Uncomfortable because his bowels haven't moved. S. S. enemas have been necessary since he had typhoid (?). S. S. enema with good results. Chest x-ray Slight decrease in effusion on right again. Otherwise same.
10-7-30 Hb. 75%, RBcs 4,500,000, WBcs 19,000.
10-8-30 Complains of food sticking in throat. Ate no supper. T still running 100-101 .P. 90-130. Blood culture still negative.
10-10-30 Atropine drops V. (1-1000 t.i.d. a.c.) Sodium bicarbonate gr. viiss, t.i.d. a.c.
10-12-30 Nauseated after eating. Transfusion of 150cc blood. Petrolagar oz. ss, every H. S.
10-14-30 X-ray of chest About same as before, plus parenchymal pathology in both bases.
10-15-30 Orange juice and 1/2 yeast cake b.i.d. Nauseated and does not eat much. Hb. 65, RBcs 3,900,000, WBcs 17,5000. P 78, L 17, M5. Lethargic Seems in poor condition.
10-17-30 Emesis once. Very quiet. X-ray Esophagogram shows no displacement or compression of the esophagus in region of left atrium. Appetite poor. T. 100-102 . S.S. enemas for bowel every few days. Soda bicarb. and atropine stopped. Liver extract vials 1 b.i.d. begun.
10-22-30 Wassermann - State Board negative. Larson Positive. X-ray G. I. study. Obstruction at distal end of esophagus just at entrance to cardia extending about 1 cm. above diaphragm. Suggests cardiospasm but extent and incomplete closue is against this. Possible stricture from mediastinal adhesions. Syggest re-examination after antispasmodic.
10-25-30 Blood culture of 9-25-30 shows gram positive cocci, single and in pairs. Vomits medications.
10-27-30 G. I. x-ray - Unsuccessful as patient was unable to take barium meal. Pain in stomach, Emesis of food occasionally. Uncomfortable.
10-29-30 300 cc. Transfusion. Refuses liver. Emesis continues. Nasal tube feeding instituted. 300 cc. retained. Mantoux negative. T. 100-102 daily.
10-30-30 Gastric lavage. 75 cc retention. Gavage feeding retained but nausea follows procedure.
10-31-30 X-ray Barium by stomach tube. Negative stomach, dilated duodenum.
11-1-30 Lavage and gavage. Very uncomfortable generally. Hb. 85, WBcs 21,750 P 120-130, T 100-101 (lower now).
11-7-30 Chest x-ray Right pleural effusion, with adhesions to diaphragm. Possible infiltration of right base.
11-11-30 300 cc, citrated blood intravenously. Nausea still troublesom. Refuses to eat. T 100-102. P. 100-130.
11-12-30 X-ray Right maxillary and ethmoidal simusitis.
11-14-30 Hb. 83%. Appetite improving.
11-17-30 Emesis.
11-19-30 Expectorated large amount of mucus containing small amount of food.
11-20-30 Lungs are clearing. Two feedings between meals. Seems brighter.
11-21-30 T. to 103 today but seems better.
11-23-30 Pleural fluid negative (State Board animal innoculation for T. B.

negative) No complaints.
11-24-30 Chest x-ray Chest negative. Esophagogram. Density and irregularity at left base, represents probably a diaphragmatic pleurisy with a lower respiratory infection. Large right pleural effusion.
11-25-30 Hb. 80%. RBcs 4,690,000. WBcs 20,100. Good day.
11-26-30 Blood streaked sputum. T. 100-102.8. P. 120-140.
11-28-30 Pain in chest. Friction rub on left side.
11-29-30 Chest x-ray Pleural effusion as before on right. Mottling suggests parenchymal involvement. Some, but less marked on left. May be thickened pleura. Pulmonary congestion - both bases.
12-4-30 To dentistry for reading and prophylaxis. Good day.
12-5-30 Pain in left side. 26 cc blood injected subgluteally. Stomach upset. Feels weak. T. 101-104. P. 140.
12-6-30 Emesis twice. Ice cap to lower thorax.
12-8-30 Emesis once. No complaints. Sleeps soundly.
12-9-30 Thoracentesis (20 cc.). WBcs 1700 (?). Staph. on culture. T 99-102.8, P 120-130.
12-10-30 Nausea and vomiting.
12-12-30 Complains of cold feet and back.
12-15-30 Expectorates a good deal.
12-16-30 Takes solid foods better than liquids! Ankles both edematous and painful at times.
12-17-30 Appetite poor.
12-18-30 Right foot and ankly very edematous. Left foot somewhat swollen. Ate large breakfast. Hot water bottle to right foot for pain.
12-19-30 Stomach ache from liver extract.
12-21-30 Stomach ache again. Listless.
12-22-30 Right leg very tender. Drowsy and irritable.
12-23-30 Right ankle and thigh more edematous. Picks at nose.
12-24-30 Expectorates a good deal. Fair day.
12-25-30 Pain in left side of thorax. Cheerful.
12-28-30 Flushed. Pulse rapid and thready. T 104 at times. P 150 Pain gone.
12-31-30 X-ray 6' heart, esophagogram. Stenosis of esophagus extended up a slight degree but there is marked relaxation of cardiac orifice now, with rapid emptying of esophagus. Heart smaller, but still large. Fluids at both bases with increase on right-bilateral effusion. Marked infiltration of lung on right side posteriorly behind heart, especially. Suggests chronic fibrosis as in unresolved pneumonia or in bronchiextasis.
1-2-31 Hb. 51% Pain in stomach when coughing,
1-3-31 225 cc. citrated blood intravenously. Thoracentesis 20 cc. blood tinged.
1-7-31 No growth on culture of pleural fluid. X-ray No change since last examination. Unable to eat. Pain in abdomen and right side of chest. Moans in sleep. Coughing. T - 99 - 103.
1-9-31 Schick test - no reaction.
1-13-31 Right leg elevated. Light cradle.
1-14-31 Size of previously enlarged abdominal vessels decreased.
1-15-31 Pain in abdomen.
1-16-31 Pulse rapid. Face flushed.
1-17-31 X-ray - Acute maxillary sinusitis on left, chronic max. sinusitis right. T. going up from normal to 103 in the last week.
1-18-31 Codeine gr. ss. Coughs a great deal and expectorates more.
1-19-31 Hb. 39%. RBcs 2,100,000. Pain in abdomen. S. S. enema. Highly colored results. Abdominal distress and is slightly nauseated. Refuses to eat. Listless and weak. Responds fairly well. Mother attempted to elevate

patient on pillow. Expired suddenly at 2:17 P. M. T. 100.

AUTOPSY: The subcutaneous fat is scanty in amount. There is approximately a liter of cloudy yellow fluid containing flakes of fibrin in the peritoneal cavity. The omentum is rolled up under the stomach. The intestinal coils are injected. There is a marked edema of the peritoneum and the tissues lateral to the lower thoracic region. The diaphragm is at the 4th rib on the right, 4th interspace on the left. The appendix is subcecal and free. The gall-bladder is distended. The liver extends 3 cm. below the costal margin on the right midclavicular line 8 cm. below the angle of the xiphoid, is at the costal margin on the left.

When the chest plate is removed dense adhesions are found between the structures of the anterior mediastinum and the wall. There are firm fibrous adhesions in the right lower thoracic cavity and a few on the left. The dense adhesions are found in the right lateral thoracic space and between the lung and the mediastinum on both sides. There is approximately 1/2 liter of yellowish fluid in the right pleural cavity and the same on the left. The fluid is thin and yellowish brown in color and different from the peritoneal fluid in this respect. There are adhesions between both lungs in the diaphragm. There is a collection of cheesy material below the diaphragm in the midline extending to the left but not to the right. The collection is to the left of the liver. There are multiple firm, fibrous adhesions between the liver and the diaphragm. Pus is encountered deep within the peritoneal cavity to the left of the liver. There is a collection of greenish yellow, granular material between the pericardium and the left lung. Portions of the pericardial sac is separated from the diaphragm and discloses similar exudate to that seen o n the left side. The pericaridal sac is densely adherent to the heart and on the left side a collection of dry exudate similar to that seen elsewhere is found.

The heart is next lifted up and a careful study made of the region of the esophagus at the diaphragm. A probe passes through without difficulty and there is apparently no involvement of the mucus membranes. An attempt to pass the finger, however, meets obstruction. This is due to a dense, fibrous mass of tissue around the esophagus and in the posterior mediastinum. The same condition is found on the right obstructing the inferior vena cava. While a probe can be passed, there is definite interference with the lumina. The vena cave (inferior) below this is opened and a large thrombus is found extending down to the bifurcation of the iliac. The heart weight 140 grams. The surface is roughened due to adhesions. A careful study made of the valve edges reveals no disease. The muscle is cloudy and soft and there is no evidence of anomaly. The root of the aorta shows a few yellowish plaques.

The right lung weighs 420 grams, the left 400. The surfaces are both roughened due to adhesions. Longitudinal sections through these reveal the following changes: there is a subpleural hematoma in the upper lateral portion of the right upper lobe 2 cm. in diameter. Throughout both lungs and especially on the left, there are multiple dark red, small infarcts (?). The right lower lobe shows dense, fibrous changes suggestive of an interstitual change. Similar changes are present on the left side but they are not so marked. In addition, there are raised, nodular areas of greyish red consolidation from purulent exudato can be expressed (solid and cystic).

DIAGNOSIS:

1. Chronic pneumonitis (cornification)
2. Multiple pulmonary abscesses (solid and cavitation)
3. Chronic, suppurative and proliferative pleuritis, mediastinitis, pericarditis and peritonitis (subphrenic and porta hepatis (adhesions).
4. Obstruction of esophagus and inferior vena cava.
5. Chronic maxillary and ethmoid sinusitis (clinical).
6. Obstructive varices (abdominal Wall) with thrombosis.
7. Edema of lower half of body (subdiaphragmatic)
8. Thrombosis of inferior vena cava.
9. Acute fibrino-purulent peritonitis.
10. Bilateral hydrothorax
11. Passive congestion of spleen, liver and kidney.
12. Hyaline perihepatitis.
13. Lymphadenopathy, (abdominal, mediastinal, and peribronchial).
14. Puncture wounds.

COMMENT: Onset of illness was bronchopneumonia? summer of 1929. Never recovered. Exacerbation July 1930, probably due to chronic pneumonia (abscess and bronchiectasis). Pericardial friction rub September 1930. Early thoracentesis revealed high white count, but not typical exudate. Taps were repeatedly negative for tubercle bacilli. X-ray finding of bilateral effusion and change in cardiac shadow at early opportunity for examination. Fluid fluctuated repeatedly as well as clinical signs. Obstruction in mediastinum (food sticking in esophagus) was demonstrated at autopsy to be due to mediastinal adhesions (x-ray diagnosis). There was only one positive blood culture (gram positive cocci). Note flare-up of chronic sinusitis which is usually a part of the picture of lower respiratory infection. Development of venous obstruction (peripheral edema of the lower extremities) occured 12-18-30. The collateral circulation (of the abdominal wall) which later was thrombosed, was noted at a later date. Abdominal pains and signs of distress (peritonitis and thrombosis of interior vena cava followed by suggestive signs of pulmonary embolism) were due to stasis and infection. The entire course was marked up by chronicity and exacerbation. This is undoubtedly a case of Pick's disease on a non-tuberculous basis. Suggestion that it was due to rheumatic fever has been made.

ABSTRACT: History was formerly presented by title ("Pick's disease"). The case is that of a boy 12 years old who spent 96 days in the hospital, dying 1-19-31. The illness started as bronchopneumonia (1929), fatigue in summer of 1930, followed by development of chronic, respiratory infection with productive cough, foul yellow sputum, precordial pain and pleural effusion. Repeated chest taps and animal innocculations failed to reveal tuberculosis. Tuberculin tests negative. During course of illness food stuck in throat, and he eventually developed an extra esophageal mass which interfered with swallowing. Other developments were pericardial effusion, marked infiltration of lungs, constriction of inderior vena cava, terminal thrombosis, and sub-diaphragmatic edema. The fever and clinical course (remissions and exacerbations) resembled "rheumatic fever" of lungs, pleura and pericardium. At the autopsy pulmonary embolism was not found although the death was sudden and the possible source of an embolus was demonstrated. When the chest plate was removed, dense adhesions were found. Two types of fluid were demonstrated; thin, yellowish brown, and thick, yellow cheesy material. There was extension below the diaphragm and marked mediastinal

involvement. The lungs showed dense fibrosis suggestive of an interstitial change, present on both sides, but more marked on right. In addition solid and cystic areas from which purulent exudate was expressed were found. Suggestion was made at the time that the appearance was that of actinomycosis. Early sections failed to reveal the organisms but later they were found. Diagnosis should therefore be changed from Pick's disease to Inthrathoracic Actinomycosis.

2. INTRATHORACIC ACTINOMYCOSIS:

The case is that of a married female, age 29, admitted to the University Hospitals 2-14-31 for chronic pulmonary disease.
Jan. 1930 - Developed cough and substernal pain. (Severe). Other complaints: fever, generalized aches and pains. Raised small amount of sputum. Substernal pain aggravated by coughing, not by deep breathing. Pregnant at time.
Mar. 1930 - Delivered a full term infant. Felt better for a time.
Aug. 1930 - Hemoptysis (1/2 oz. of blood).
Oct. 1930 - Pain in region of 3rd, 4th, 5th left ribs in midclavicular line.
Jan. 1931 - Was patient at tuberculosis sanatorium where diagnosis of possible malignancy was made. Pneumothorax collapse of upper lobe obtained. Fluids filled pleural cavity. Thoracentesis was done. Bloody fluid removed. Abscess? of chest wall formed at site of aspiration. Prior to treatment had one tblsp. full of sputum daily; then she raised more; now only small amount, approximately same as before treatment.
Feb. 14, 1930 - Admitted to hospital. Chief complaint: steady fever for past 4 months, intermittent before, chest pain, weakness, weight loss (35#), chronic cough, slight amount of sputum. Condition has grown progressively worse since fall of 1930, so gradual she has been unable to place exact time of change.
Past history: Scarlet fever 27, whooping cough 22, tonsillitis with sore throat occasionally. Tonsils removed 1926. No history of exposure to tuberculosis. Four children living and well. One miscarriage. Physical examination: Well developed, poorly nourished female lying quietly in bed. Pain when she moves about. B.P. 120/60. Reflexes normal. No enlargement of glands, except one in left axilla about 2 cm. in diameter, firm, freely moveable and not tender. Chest: marked limitation of motion of lest. Definite flattening below 3rd interspace. Left breast more prominent than right, displaced slightly downward and outward. No masses in breast. No retraction of nipple. Below left breast there is a diffuse hard tender swelling. Extends from 3rd interspace down to 7th rib; anterior axillary line to within 2-3 cm. of sternum. Intercostal spaces obliterated. The maximal point of tenderness is about 3rd space about 3 cm. medial to anterior axillary line. Diffuse, firm swelling in lower portion of left axilla (tender). Extends between axillary lines and from 4th to 8th ribs. The skin is slightly discolored and there is increased heat. Small scar from previous puncture. Another scar is in 2nd interspace. Right lung normal. Left lung shows decreased tactile fremitus and flattening. Breath sounds absent anteriorly except from apex to 2nd interspace. Also absent in axillar except very high up (weak.) Heart sounds present posteriorly. Absent about 7th spine. Coin test negative. Voice sounds absent at base. Rales base of left lung and high in axillar. Heart sounds weakened anteriorly; probably not enlarged. Liver palpable 4 fingers below costal margin. Slightly tender. Spleen not palpable. No masses or rigidity. Extremities normal.
Laboratory: Urine negative. Hb. 70%, RBCs 3,330,000, WBcs 19,700, P 82, L 16, M 2. B.U.N. 15. Pleural fluid: 100 cc. spec. gravity 1024, straw colored, slightly cloudy. Numerous RBcs. Total cell count 35,000. Wassermann negative.
X-ray: Evidence of hydropneumothorax left. Definite displacement of heart. Adhesions at left base. Considerable movement of fluid obtained. When

Trendelenburg's position is used, there is evidence of mass infiltrating lung. Suggest primary lung tumor. Possibility of abscess cannot be excluded. Conclusions: Hydropneumothorax. Pleural adhesions. Possible pulmonary abscess. Primary lung tumor left base. Sputum examined (9 times). No evidence of tuberculosis or actinomycosis. Pus from abscess: Degenerated and disintegrated cells; no organisms; no actinomycosis. Cultures on blood agar sterile. Cultured on glucose agar for actinomycosis; fluid from pleural cavities sterile. No blastomycosis in sputum. Spinal fluid negative. Stools negative. PSP 1st hour 60%, 2nd hour 15%, total 75%. Guinea pig innocculated. Bronchoscopic examination: Larynx and trachea normal. Right bronchial orifice not obstructed. No pus seen. Left same. "If lung is involved, it comes from a source outside the bronchi, most likely the external chest wall". Thoracentesis 2-20-31. No fluid obtained. Evidently pleural surfaces are adherent. Small amount of blood found. Piece of tissue removed and sent for section. Microscopic sections show purplish colored fungis arranged concentrically. Under high power central mycelia can be seen but the club-like ends cannot be brought out by the hematoxylin.

DIAGNOSIS: actinomycosis.
2-24-31 - X-ray. Hydropneumothorax left decreased. Displacement of heart and mediastinum to right, probable encapsulated empyema left, possible endothelioma of pleura, left. 3-4-31: Mass in left lower lobe displacing bronchi, probable stenosis of left lower lobe bronchus, slight periostitis of ribs (left lower). Temperature varies from 97 to 103, septic type. Patient will be shown.

3. CONGENITAL HYPOPLASIA OF THE RIGHT LUNG AND BRONCHUS. Path. O'Brien.

The case is that of a white female infant 7 months of age, admitted to the University Hospital 1-10-31 and died 1-11-31 (1 day).
6-16-30 Date of birth, 6 1/2 #. Purple but cleared up at once. Normal pregnancy and delivery. Artificial food necessary as mother had no milk. Maternal grandmother had tuberculosis. No exposure of patient. Attacks of dyspnea with noisy breathing when baby cried noticed from the first. Hands became blue at times. Attacks usually subsided in a short time.
8-1-30 - Regular observation at Well's Memorial began. Heart and lungs were normal. Mother was told that baby was in good condition.
9-?-30 - Baby buggy tipped over backward. Head thrown against end of buggy.
12-9?-30 Peculiarity (flaring?) of ribs noticed by physician.
1-7-31 - Mother was told that baby's heart could not be heard on left and only faintly on right. X-rays were advised.
1-10-31 (Early evening)- Attack of dyspnea, cyanosis, and laryngeal stridor began. Did not subside as usual so patient was taken to the University Hospital and admitted at 2:20 A. M.
Physical examination - Pale, somewhat cyanotic baby of seven months with harsh, noisy difficult respiration. T. 99.8. Throat - Full of mucus. No membrane. Chest - Equal expansion on both sides with some retraction. Dullness on right side. Loud respiration. Heart - Tones heard on right (?) Impression - (1) Congenital heart. (2) Probable Dextracardia. (3) Atelectasis.
Laboratory- Hb. 90%. WBcs 11,800. Pmns 79, L 19, Mono. 2.

2:20 A.M. - Continuous steam inhalations begun.
3:40 A.M. - Adrenalin Miss (H) Very restless.
4:10 A.M. - Chloral hydrate gr. V (R). Color good. Breathing rapidly.
10:50 A.M.- Atropine M ii (1-1000).
11:40 A.M.- Lxygen started. Difficulty in breathing. Color fair.
12:50 Noon- To operating room. Fluoroxcopy and x-ray, and bronchoscopy done.
X-ray - Entire right lung fields obliterated by a dense shadow. Heart, trachea, and mediastinum markedly retracted to this side. Rt. diaphragm cannot be made

cut. Left diaphragm moved fairly normal and there is compensatory emphysema of the left lung field. Appearance quite characteristic of atelectasis due either to a non-opaque foreign body or possibly congenital in origin. A spina bifida of the upper thoracic vertebra and also of some of the lower vertebrae is present. Conclusion - (1) Massive atelectasis, right. (2) Spina bifida of lower cervical and upper thoracic spine. (3) Compensatory emphysema, left lung field. Bronchoscopy- Deviation of trachea to rt. No cause for atelectasis found. Probably congenital. No primary branching observed.

2:50 P.M.- Chloral hydrate, gr. X (R).
4:00 P.M.- Temperature 103.4.
6:00 P,M.- More difficulty in breathing. Gavage 1z. LV. formula.
6:35 P.M.- Atropine (1-1000). M ii (H).
8:00 P.M.- Very restless. Respiration labored - 84. Temperature 104.2.
8:15 P.M.- Chloral hydrate, gr. X (R). Oz. II water by gavage.
9:15 P.M.- Formula oz. IV, gavage, Cyanotic at times. More mucus. Respirations
10:00 P.M. Atropine (1-1000). M i (M). 72.
10:40 P.M. " " . M i (H) Chloral hydrate gr. X. (R).
12:30 P.M. Caffeine sodium benzoate, gr. iii (H). Pulse 30. Respiration labored, shallow - 48.
1:00 P.M. - Formula oz. IV. gavage.
2:00 P.M. - Temperature 107.2 (R). Respirations more shallow.- 48.
3:20 P.M. - Cyanosis and exitus. (Note)- Temperature rose steadily from 99.8 to 107.2 in 24 hours.

Autopsy - The body is that of a white female infant 68 cm. in length, weighing approximately 14#. Slight rigor is present. Hypostasis is purplish and posterior. No edema or jaundice. Lips and nails are cyanotic. The skin is pale except for reddish blue mottling over the lateral surfaces of the trunk and thighs and a small amount on the chest. Development and nutrition are fair although the body is probably smaller than the normal infant of this age. The pupils are negative. The anterior fontanel is open and measures 1 1/4 cn. in diameter. There is a deformity of the right ear. The suricle is folded over and flattened. No other gross anomalies noted. The subcutaneous fat over the anterior abdominal wall is 1 c. in thickness.

The left pleural cavity is free of adhesions. It contains a very large lung with emphysema of the medial portions (compensatory hypertrophy). The lung extends beyond the midline and occupies a larger thoracic cavity than the right. There is a patch of dark blue atelextasis in the upper portion of the left lower lobe. There is a suggestion of a formation of a 3rd lobe but this is not complete. The great interlobar fissure is fused except in the upper portion. There is distinct reduction of crepitation. The right pleural cavity is practically obliterated by fibrous adhesions. It is occupied by the heart, the thymus and to a slight extent by a sweep of the trachea. The ductus arteriosus is patent on the pulmonary side but closed on the aortic side. The foramen ovale shows a small, slit-like opening.

The heart is diffusely enlarged and hypertrophied. The valves are normal. The interventricular and interauricular septums are otherwise normal. The aortic arch shows an anonymous carotid and subclavian branch which are detected at this stage. The contents of the thoracic cavity removed en masse starting with the larynx and extending down to the diaphragm. The larynx is not the seat of disease. The trachea is opened and shows slight congestion. It seems to be a straight tube running directly to the left lung. On the right side there is a small diverticulum which communicates with a mass of indefinite fibrous tissue in the right chest. No definite lung structure can be made out. The thymus is dissected free of the mass and found to be approximately normal in size. The esophagus is normal in size, position and shows no anomalies. The immediate cause of the sudden change

in symptoms with lethal outcome is not demonstrated at this period of the examination.

DIAGNOSIS:

1. Congenital hypoplasia of right lung and bronchus.
2. Dextrocardia.
3. Fibrous adhesions, right pleural cavity.
4. Anomaly of right ear.
5. Congenital hypertrophy of left lung (compensatory).
6. Emphysema of left lung.
7. Hypertrophy and dilation of heart.
8. Spina bifida.

COMMENT: Note multiple anomalies (ear, spine aortic arch, bronchus and lung). This is in accord with clinical and pathological observations. The cause of death was due probably to respiratory infection (left lung.).

4. SPORADIC CRETINISM. Path. Henriksen & O'Brien.

The case is that of a white male infant admitted to the University Hospital 1-13-31 and died 2-8-31 (26 days).
12-5-30 - Baby delivered at term after normal labor. Birth weight 4.6 kg. Breathed spontaneously. Developed jaundice. (Mother has had 5 children - 1st one required forceps, the next three were breeches, the 2nd of these dying). Mother thought that there was an infection of baby's naval. It dropped off the 9th day and healed in a week. A physician suspected an infected thrombus. Baby nursed well at first, then in the second week it seemed to grow weaker and seemed unable to nurse. There was a loss of 2# the first month. 1/2 # in the 5th week.

1-9-31 - A physician was consulted and complement feedings were started. The baby lost no weight after this.

1-13-31 - Entered the University Hospital. Family history - Father and paternal grandmother (?) are bleeders. All grandparents except one are living and well. Paternal grandparent died of Addison's disease. Gavage feedings begun. T 99.4. Physical examination - Weight 3 1/2 Kg. Baby is jaundiced and is slightly dehydrated. The skin is in loose folds. It is unresponsive and weak. Laboratory -Hb. 122%, RBcs 5,030,000, WBcs 5,050. P 38, L 54, E 6, M 2. Schick test - no erythema. Manteaux - negative. Urine - negative. A physician on the outside performed the following laboratory tests: Van den Bergh - direct 4 plus, indirect 3 plus. Fragility - normal. Urine - no bilirubin. Trace of urobilin. Stools - bile pigment present. Wassermann - State Board negative.

1-15-31 - Regurgitated oz 1 of feeding. Color flushed. T. 102.5.

1-16-31 - Abdomen distended, but not as hard as previ ously, Turpentine stupes begun. T 99.2.

1-17-31 B. M. R. suggested because of cretinoid appearance.

1-20-31 - Weight has increased from 3 1/2 kg. to 4.35 Kg. T up again to 103.2. Abdomen less distended. Breathes as if it had a cold.

1-23-31 - Moved from crib to premature basket. X-ray- Evidence of delay in ossification of epiphyseal centers. Whole appearance is consistent with the

delayed growth which would occur with cretinism.

1-24-31 - Regurgitated oz. 1 1/2. T 99. Weight 5.33 kg.

1-24-31 - Hb. 81%. Fairly good day.

1-27-31 - Cod liver oil, drams 1, t.i.d. Gaining weight steadily.

1-30-31 - Becomes cyanotic for a short time at intervals.

1-31-31 - Nasal oil every 4 hours (2 days). Buttocks excoriated. Zinc oxide applied. Regurgitated oz. 3. Cyanotic spells.

2-2-31 - Abdomen greatly distended. Turpentine stupes to abdomen. Emesis of thick, curdled milk. Tap water emena diminished distention.

2-4-31 - X-ray - No appreciable change in bony development.

2-5-31 - Hb. 53%. X-ray - No evidence of pathology in the abdomen.

2-7-31 - Regurgistated oz. 3 of 2 A. M. feeding. Three loose stools of slightly greenish color. Fair day.

2-8-31 - 8 A. M. Abdomen very distended and hard. Generalized cyanosis is present. Breathing is labored. T 97. 4 P.M. Listless. Color better. Has diarrhea. 5 P.M. Regurgitated. 5:30 P.M. Oxygen started. Very cyanotic. Very listless. 5:40 P. M. caf. sod. benz. gr. 2 (H). 5:55 P.M. Expired.

Autopsy - The body is that of a malformed white male infant weighing 4520 grams. The crown rump is 42, crown heel 61. Riger is present. Hypostasis is purplish and posterior. There is a diffuse edema of the entire body present which does not pit on pressure. There is no cyanosis or jaundice. The pupils are negative. The face is fairly normal in appearance except for marked thickening of the lips which are gaping. A thick tongue protrudes between them. The nose is a little thickened at the end. The head is covered with a profuse growth of red hair. The anterior fontanel is open and extends down into the forehead. (3 cm. in diameter) There is marked prominence of the abdomen. The testes are descended. When the body cavity is opened, a peculiar kind of edema is seen. No fluid escapes on pressure. It has a gelatinous, thickened appearance, and the change is not only present in the skin but in the subcutaneous tissues and the muscles. When the tissues are reflected from the chest wall, a peculiar nodular, lobulated, glistening surface is exposed. The liver is very large, extending 5 cm. below the costal margin. The stomach is greatly distended. The small intestine is prominent. The walls of the intestinal tract are markedly thickened so that they do not collapse when they are squeezed. The diaphragm is at the 5th rib on both sides. The appendix is subcecal and free.

The pleural and pericardial sacs do not contain any excess fluid. The pleura shows the same thickening seen elsewhere.

The heart weights 40 grams. The chambers appear enlarged, but not dilated. The surface is glistening. There is a small patch of subepicardial hemorrhage present in the right lateral border. The valves are normal. The foramen ovale is patent. The dustus arteriosus is closed. The root of the aorta is normal.

The right lung weighs 55 grams, the left 45 grams. The pleural surfaces are slightly mottled but air containing. There is a small subpleural hemorrhage

in the medial border of the right upper lobe. There is a small hemorrhage beneath the pleura in the left anterior surface the lower portion of the left upper lobe. Both lungs are air containing. The bronchi are very carefully dissected out, but no foreign material is seen.

The spleen weighed 16 grams and is slightly adherent by recently formed firm adhesions. The surface is purplish in color and the organ is swollen. On section the cut edges evert. The pulp is dark bluish red and firm.

The liver weighs 270 grams. The surface is slightly mottled and glistening. On section the cut edges evert. The exposed surface has the same gelatinous appearance as seen elsewhere. There is no darkening of the centers of the lobules. The gallbladder and ducts are carefully exposed. No evidence of obstruction is found. When pressure is exerted on the gallbladder, bile escapes from the ampulla vater. The gastro-intestinal tract is pale and thickened. When the stomach is opened partially digested, milky material is present. There is some postmortem change in the mucous membrane. The upper portion of the lesser curvature contains an eroded area which resembles postmortem change. However, outside of this there is an area which suggests partially organized exudate. The stomach is adherent by fine adhesions to the under surface of the liver. It is separated without very much difficulty. The pylorus is pale and contracted but no evidence of tumor is found. The small intestine shows the same change as the stomach and no anomalies are seen.

The pancreas is normal. The adrenals are large, weighing 9 grams each. They show softening and hemorrhage. The right kidney weighs 30 grams, the left 35. The capsules strip easily exposing lobulated surfaces. On section they have an appearance similar to that seen in the liver. The pelves, ureters and bladder are normal. The external genitalia are normal except for the myxedematous change. The lymph nodes throughout the body cavity are not enlarged. The aorta is smooth and pale. The thymic body is very small and atrophic. It is dissected out and weighs approximately 5 grams.

The muscles of the neck show myxedema. The thyroid gland was searched for but the structure cannot be identified. There is a small amount of flat and reddened tissue over the cartilage in the region of the thyroid gland. The gland and cartilage are taken for further examination. There is no evidence of cysts or anomalous thyroid tissue in the neck. The thickened tongue is pushed backwards and the base of the tongue removed for study. No evidence of thyroid tissue at the base of the tongue. The head is not examined.

DIAGNOSIS:

1. Congenital cretinism.
2. Probable hypoplasia of thyroid.
3. Hypoplasia of thymus.
4. Hypertrophy of adrenals (hemorrhage and softening).
5. Marked myxedema of all soft tissues.
6. Hypertrophy of tongue.
7. Myxedema of intestinal tract (including esophagus)
8. Hemorrhages of pleura and epicardium.
9. Marked myxedema of diaphragm and chest wall.
10. Recent adhesions of stomach and liver.
11. Erosion of stomach.
12. Probable localized peritonitis (lesser curvature).

Comment: The jaundice was hemalytic? (no bilirubinuria) but the cellular resistance was normal. Two other sources for intrahepatic jaundice are possible: infection of umbilical vessels or myxedema of liver. The jaundice had cleared at time of death. The appearance was characteristic of cretinism of sporadic type. The family history showed bleeding and Addison's disease but no note of condition of thyroid. Notice X-ray evidence of delayed ossification (see literature abstract). The finding in the stomach was unusual. A small amount of thyroid tissue was found (hypoplasia), no extra cervical tissue demonstrated. One of the reasons given for desire to give autopsy permission was satisfaction from grandfather's examination (Addison's disease.)

IV. ABSTRACTS

1. Actinomycosis. Abstr. Randall. References - (1) Kolle, A. and Hetsch, H. Exper. Bakt. und d. Infek. Krank. 39, 675-682, 1922. (2) Gruber, G. B. Hand, der Spec. Path. Anat. u Hist. 5-525-534, 1929. (3) Colebrook, L.J. J. Exp. Path. 197-212, 1920. (4) Brickner, W. M. Annals Surg. 81, 343-1925. (5) Wright, J. W. J. M. Research, XIII, 304-405, 1905. (6) Modern Medicine. (Osler and McCrae) 1-783, 1925. (7) Kaufman, E. Trans. of Lehrbuck der Path. Anat. (Reimann, S. P.). Blakistons Sons & Co., 1929 (8) Sanford, A. H. & Voelker, C. B. Collected Papers, Mayo Clinic, Vol XVII, 1926. (9) Halpern, J. & Levinson, A. J. A. M. A. 91:13 (July 7) 1928. (10) Gittings S. & Thorpe, T. Am. J. Dis. Child. 32:50, Oct. 1926. (11) Lindsay, C. Canad. M.A.J. 17, 944, (Aug. 1927). (12) Siegmund, H. Hand. d. Spec. Path. Anat. u. Histol. 4:398-400, 1929. (13) Logefeil, R. C., Minn. Med. XIII, #10:716 (Oct.) 1930.

1. Definition: Chronic suppurative proliferative progressive granulomatous infection caused by ray fungus (actinomyces bovis) includes streptothrix and leptothrix.

2. Age- Usually 20-30. Males predominant. Rural dwellers frequent. Reported in all walks of life.

3. Types - Head and neck 62%. (2) Abdominal 18%, (3) Thorax 14%, (4) Miscellaneous about 2% (skin, muscle , fascia, nervous system) combinations exist: head, neck, mediastinum, etc.

4. Source - Occurs in cattle, hogs, donkeys, horses, dogs, cats, elephants, sheep and man. Difficult to produce experimentally. Not transmitted animal to man or man to man. Believed to be saprophyte in mouth and intestinal tract (non-pathogenic? low virulence?) Widely distributed in vegetable kingdom (aerobic type, non-pathogenic?). Enters tissue on penetrating foreign bodies (one of our cases splinter of wood in abdominal wall). Horses bite grass with incisors (few tongue lesions). Oxen use tongue in eating (Many tongue lesions). Portal of entry may heal especially in intestine followed by abscess of liver. Chewing strws is source?

5. Morbid Anatomy - Microscopically lesions show extensive fibrosis, areas of suppuration (often around actinomycotic colonies) surrounded by cellular zones. Fatty changes (lipoid) are seen in periphery. Extend by contiguity and blood Stream, not by lymphatic extension in man. Possible tubercle formation may be seen (one of our cases?) The two diseases may be associated. Such cases should be stained, expecially for tubercle bacilli as well as fungi. Striking change is marked vascularity near edge of suppurating zone. Erosion of bone prominent in animals, may occur in man. A secondary infection may occur. The cause of the cachexia is debatable. The lesion may heal by scar formation and absorption of organism? Fistulous tracts form (irregular pockets) Any organ may be involved. In animals lesions are fibrotic and nodular. Tendency toward progressive, profuse, extending suppurating lesion in man. May be confused with acute suppurative appendicitis, tuberculosis or

malignancy. When perforations develop the disease should be recalled. The liver is involved in 20% (pinpoint foci, honeycombing single large focus, tumor-like nodules, varied extensions. Cecum is frequent site in intestinal tract (marked tendency to spread from intestinal source). May be confined to rectum (confused with carcinoma, stenosis). May develop on base of peptic or duodenal ulcer. In the lungs the lower lobes are usually involved. Complications: (pleural effusion, fistulous tract, caries ribs, skin lesion from secondary contamination, hemorrhage from pleural cavity.

6. Diagnosis: Discharge is at first purulent. Later it is thin and watery. In this state biopsy is of greatest value. Microscopic sections also show picture of pathologic change and colony. Fistulous tracts are often helpful in diagnosing (torouosity and multiple branching); in abdomen may communicate with intestinal focus (demonstrate extent of lesion before operative procedure). As the disease progresses cachectic picture is prominent. (pain).

7. Incidence - (Sanford & Voelker, 1925) found 670 reported cases in literature. 42 in childhood (under 15), 5 primary pulmonary lesions in children. Since then 5 others have been reported and our case is the 6th (11th in all). The youngest was 28 days old and showed an actinomycotic abscess in lower lobe of the lung.

8. Treatment - Potassium iodide, x-ray, radium, surgical incision, packing abscess and fistulous tracts with iodine, wide excision and drainage, vaccine(?).

SUMMARY:

1. Actinomycosis is chronic suppurative proliferative, progressive granulomatous infection caused by ray fungus (actinomyces bovis).
2. Most frequent in males between 20-30.
3. Residence seems to play a part (rural) although this is not a constant factor.
4. Type: head and neck (62%), abdominal (18), thorax (14%) and others.
5. Occurs in animals (chiefly cattle) and man.
6. Difficult to reproduce in animals - no known transmission of animal to man or of man to man.
7. Believed to be common in habitant of mouth and intestinal tract of man. (Disease may develop following extraction of teeth)
8. Widely distributed in nature (cereal, grains and begetables) pathogenic?
9. Organism is of low virulence.
10. Commonly accepted belief that fungus enters by way of penetrating foreign body (straw or grain).
11. Occasional foreign body found in association with lesion (probable basis for assumption) also occupation.
12. Demonstration of portal entry is difficult and manner of infection is debatable (primary focus may heal).
13. Characteristic microscopic lesion is frequently found (fibrosis, abscess, fatty change, marked vascularity, organism). Others show tuberculoid structure. (association?).
14. Extends by blood stream and direct extension, rarely by lymphatics.
15. Secondary infection is or is not a prominent feature.
16. Mouth, neck, liver, lung, cecum (appendix) are frequent sites.
17. Sulphur granules are usually found during purulent stage of drainage (early) (seldom in serous stage).
18. Biopsy of fistulous tract (adjacent tissue) is valuable means of diagnosis.
19. X-ray visualization of fistulous tract is of help in suspecting condition (Tortuosity and branching), also extent of process.
20. More than 1,000 cases have been reported in this country.

21. Disease is apparently infrequent in children. Our case is 11th example of intra-thoracic form in this country.
22. Treatment is medical, surgical and x-ray.
23. Prognosis varies with the location, extent and duration of disease.
24. Any part of body may be affected.
25. Disease is frequently confused with tuberculosis and many patients suffering with it are to be found in institutions for the treatment of this disease.

2. Cretinism and hypothyroidism. Abstr. Henrikson.

References:

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1. Types of cretinism (Bell)
(1) Endemic. Congenital goiter, rare except in goiterous districts. In non-goiterous territories may be mixed tumor. Endemic cretins have enlarged thyroid and are less defective physically and mentally than sporadic cretins. Do not respond as well to treatment. (2) Sporadic cretins thyroid gland usually atrophic or absent. Goiterous of cretins adenomatous type. Tissue between adenomas fibrous, acini in adenomas show atrophy and degeneration.

2. Diagnosis: (Talbot)
Disease usually appears in second half of first year of life. May not be recognized earlier although present? Occasionally seen at birth. Atypical (1) hair sparse (not coarse). (2) slight thickening of subcutaneous tissues, (3) quieter, (4) suggestion of cretinoid facies, (5) hoarseness of voice. As conditions develop, (5) tongue (large and thick), may fill mouth and interfere with nursing. Thickening of subcutaneous tissues becomes more marked. Hoarseness increases. (6) Outer ends of eyebrows scanty or absent, (7) Eyes far apart, (8) pig-like expression, (9) Sclera bluish white, (10) lemon yellow tinge to cheeks near ala nasi, (11) cold, (12) after 4th month may develop marked anemia, (13) seldom laugh, (14) after 6th month retardation of growth and intensification of early symptoms. Arms and legs relatively short, (15) head large, trunk long, ossification retarded. Fontanel may remain open until 8 years of age. Forehead low and wrinkled when eyes are open. Nose broad, wide flat bridge, (16) Dentition delayed. Lips thick and not held together; (17) Myxedematous tissues make neck appear short; (18) Abdomen protrudes. Umbilical hernia nearly always present; (19) Skin pale, dry and coarse. Exzema common; (20) Striking lack of mental development. Infant sluggish, quiet and docile unless teased. Speech delayed and vocabulary limited; (21) electrocardiogram shows T-wave characteristically low (1mm. or less), flat or inverted; (22) Basal metabolism lower than any other disease - may fall to 40% below normal. Before third month depression may be very slight. Malnutrition may raise rate of metabolism. Failure to make diagnosis early is serious omission as prompt treatment offers best opportunity for mental growth. Following tests may be used: Basal metabolism, electrocardiogram, failure of edema to pit on pressure, glucose tolerance test (high), adrenalin test (not suitable for clinical use), and X-ray.

3. Differential diagnosis:

(1) Mongolism resembles hypothyroidism in early onset and retardation of growth, stupid facial expression and protruding tongue.

	Mongoloids	Cretins
1.	Small round head, flattened posteriorly.	1. Large, brachycephalic head.
2.	Oriental slant to eyes.	2. None.
3.	Button-like nose.	3. Retracted at base with flaring nostrils.
4.	Tongue small and pointed.	4. Tongue large and broad.
5.	Neck normal in length.	5. Neck shortened.
6.	Thyroid normal size.	6. Thyroid small or not palpable.
7.	Hands slender with tapering fingers and incurved little fingers.	7. Hands spade-like and plump with straight fingers.
8.	Bone and dentition changes less pronounced than normal.	8. Delayed dentition and bony development.
9.	Hair and skin normal.	9. Hair scanty, brittle and dry. Skin coarse, frequently thickened, dry, cold, cyanotic and hairless.

Other conditions:
(1) True infantilism (arrest of growth at early stage of psyche, skeleton, and soft tissues). (2) True dwarfism: symmetrical development of skeleton and soft parts not reaching normal limits. (3) Congenital idiocy may resemble cretinism in mental sphere. Spasticity or paralysis of limbs, disturbances of reflexes, etc., distinguish it. (4) Rickets: X-ray studies will determine differences. (5) Chondrodystrophy: delayed development of cartilaginous ossification centers. Resembles hypothyroidism only in dwarfism. Roentgen-ray will clear up doubtful cases.

4. Metabolic studies: Magnus-Levy shows cretins absorb less oxygen and produce less Co2 than normal individuals. Basal rate varies with severity of symptoms and may be much lower than clinical signs indicate. Nitrogen metabolism (Janney - Isaacson) low nitrogen excretion. Urea, ammonia, creatinin and phosphates are markedly decreased. Abnormal presence of creatinin. is remarkable. Experiments show food, as judged by nitrogen excretion is as rapidly absorbed and eliminated by thyroidless (or almost so) individuals as by normal people. Reduced nitrogenous and basal metabolism of cretins may be an expression of compensatory reaction of organism since chief function of thyroid is control of growth and regeneration of tissues. As normal metabolic repair and regenerative processes cannot be properly carried out because of thyroid deficiency, destructive processes are inhibited with consequent decrease in elimination of total nitrogen, purins, and fall in gaseous exchange. Cretins take less food than normal children, as they cannot properly assimilate it.

5. Osseous changes: Engelbach and MacMahon (1924), demonstrated value of x-ray examination for retarded skeletal development in fearly hypothyroidism, and established it as pathogpneumonic sign. As many children with cretinism or myxedema do not show classical evidences, value of this sign should be emphasized. Shelton (1930) restudied problem (roentgenographic). For normals. Used children who showed no signs of abnormality. Were studied on their birthdays (to get exact age). Conclusion: remarkable accord as to time of appearance of ossification centers during (1) Infantile period (1-5 years) by all observers with exception of Poland (old report). Agree that distal epiphysis of femur, proximal epiphysis of tibia together with talus, cuboid, and calcaneous should be ossified at birth. Absence of nuclei in knee and ankle point to

retardation of osseous development during intra-uterine period, (prematurity excepted). Experiments by Allen, on thyroid anlage in tadpoles indicate thyroid produces hormone of tissue differentiation rather than growth. Many cretins with slight modification of stature show markedly retarded differentiation of somatic tissue. Absence of one or more of these nuclei at birth is early and a recognizable sign of hypothyroidism (see our case). Of value when basal metabolic tests cannot be made. True mongolism, birth injuries and other forms of mental deficiency do not consistently retard unfolding of osseous system except when hypothyroidism is complication. Hypergenitalism of obscure etiology is always accompanied by rapid unfolding of the osseous system with early closure of epiphyses (macrogenitosomia). (2) Juvenile 6-12 years. Additional osseous centers and beginning of union, particularly between ischium and pubis and between trochlea and capitellum. Igreater the age greater variation of authorities). Sex plays important role. Female tends to be slightly in advance of male. Differences should therefore be made in reporting series. No great difference occurs, until about 13th birthday. A study of group of students in private school for girls in California (80% of free from endocrine disturbance menstruated first between the 12th and 14th birthday (average 13 years). Slightly in advance of general average of U. S. Difficult to determine exact time of male adolescence. 70% (students) developed secondary sex characteristics or first spontaneous ejaculation between ages of 14 and 16 (average 15). 90% of remainder came within 6 months of these limits. Early closure of epiphysis indicates ((1)) hyperactivity of genital hormones, ((2) anterior lobe of hypophysis (hypergonadism, early menstruation, behavioristic problems, and cessation of growth). If growth hormones predominate (potential gigantism) results.

Summary:

1. Sporadic cretinism is due to aplasia or hypoglasia of the thyroid gland.
2. Disease frequently manifest in second half of first year . (Present at birth).
3. Atypical forms are probably more frequent than text-book pictures.
4. Differential diagnosis may be difficult.
5. Basal metabolism may be lower than general appearance suggests.
6. Failure of osseous "unfolding" is most reliable sign (x-ray) until puberty.
7. Sex differences should be noted in adolescents (female 13, male 15), California.
8. Other secretions may influence osseous system (gonad, pituitary).
9. Results of treatment vary. Seldom are perfect. Gland may partially regenerate.
10. Usual dose of thyroxin (0.1 to 0.8 mgm.) daily. Normal growth is effect desired. Early and persistant medication is desirable. Thyroid implantation is unsatisfactory.