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GENERAL STAFF MEETING
MINNESOTA GENERAL HOSPITAL
UNIVERSITY OF MINNESOTA

CONTENTS

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DIAGNOSIS AND TREATMENT OF SYPHILIS

The manifestations of syphilis were known before the causative organism was discovered or serological tests devised. History (not positive or even suggestive in all cases) physical examination (syphilis, a disease of signs, not symptoms - Stokes) including special diagnostic aids (x-ray and biopsy) and serologic investigations are all in order if a higher percentage of cases of syphilis is to be recognized.

The recognition of this disease is most important as it is one of the few for which we have specific treatment. But the story of treatment is a complicated affair. Many patients without the disease are getting treatment for it, some syphilitics are getting too much treatment, others too little, in some persistent efforts are made to continue treatment in the face of definite contra-indications. We, at Minnesota, are fortunate in that we have a group of men who are interested in this disease (its recognition and proper treatment) and are anxious to know the results of such treatment.

We can do but little more than "hit a few high spots" today hoping that it will serve the purpose of creating more interest in this important subject. We have routine Wassermann service (but all patients do not get it?) and it is difficult to get cooperation in returning "agreement" slips (probably because many do not look for evidence of disease). We can get "specialized" advice at any time in both the diagnosis and treatment of this disease--why not take advantage of this service?

The following case report serves as an introduction to this subject illustrating the principles of diagnosis and the probable effects of insufficient treatment (?).

I. CASE REPORT

TERTIARY SYPHILIS OF LIVER AND AORTA. Path. Koucky.

Case is white female, 58 years of age, admitted to Minnesota General Hospital 7-25-32, expired 8-8-32 (14 days).

Precordial pain

1- -31 - Well until this time (?). Developed pain in left anterior chest. Pain located over precordium, intermittent but never radiated to other side or down arms. Because of pain, confined to bed for about 3 weeks. Also felt tired. Recovered and returned to work without symptoms until October 1931 (10 months).

Hematemesis

10-15-31 - While sitting on chair in evening, felt distress across upper abdomen. Became nauseated and vomited about one-half pint of blood. Felt very weak but had no other symptoms.

Coma, Dyspnea, Edema

6- -32 - While at stool, had violent emesis (projectile), watery stool, sharp non-radiating left chest pain, went to bed and apparently became unconscious for about 6 hours. Awakened confused and extremely weak. Became dyspneic. Had to use 2 or 3 pillows to prop her up in bed so that she might breathe easier. Noticed edema of ankles (became progressively worse). 7-12-32 - Difficulty in urination. Soon after this unable to void, then voided small amounts of highly colored urine. In bed ever since.

Admitted

7-25-32 - Physical examination: White female in considerable distress, dyspneic. Extreme edema of legs and abdomen. Mental condition clear. Blood pressure 136/64. (Note pulse pressure.) Eyes - pupils react to light and accommodation, visual fields normal, fundi blurring of disc on left. Neck - no lymphadenopathy. Lungs - dullness on right up to about 2nd interspace. Heart - not enlarged, sounds normal, no murmurs. Abdomen - greatly distended with fluid. Extremities - marked edema of both legs up to groin. Neurological - negative (not consultation).

Laboratory: Hb. 84%, wbc's 12,000. Wassermann 4+, cells 2, clear, colorless. Protein test - negative. Colloidal gold curve - negative. Urine - sugar 1+ (3 times). Dilution-

concentration test - unsatisfactory.
Electrocardiogram - sinus tachycardia, low voltage and thickening and splintering of Q. R. S. (myocardial disease).

Skin scars

Skin consultation - (requested because of scars on left leg). Scars are thin and shiny. Impression of Dermatological Department is that they are result of old nodular ulcerative lues, grade III.
Gynecological consultation - bulging flank, fluid wave. No definite masses palpated in abdomen. Pelvis - negative except for moderate anterior and posterior prolapse of vaginal wall and slight atrophy of uterus.

Progress

7-28-32 - Salyrgan 1cc. Complains of pain in left chest.
7-29-32 - Paracentesis, 2900 c.c. fluid.

Differential Diagnosis

8-1-32 - Heart is questionably enlarged. Difficult to make out because of ascites and pleural effusion. Sounds rapid, regular, no murmurs. Abdomen - fluid wave, otherwise unsatisfactory examination. First impression either ovarian cyst, cirrhosis of liver, or diffuse carcinomatosis. Probably not cardiac. Following removal of fluid from abdomen, ovarian cyst ruled out. Condition looks more and more like malignancy. Following return from spinal fluid tests (positive), impression is that patient probably is suffering from cirrhosis of liver on luetic basis. Daughter states mother had syphilis (with very little treatment.) Had 2 miscarriages (6 and 7 months). Note: these still-births were really premature births (much more common in syphilis for labor to occur prematurely than at any other time). One healthy child (daughter informant).

Downhill, Exitus

8-3-32 - Somewhat weaker. 99.4.
8-4-32 - Bismogenol 1 cc. intramuscularly. T.101.4. P. 144.
8-5-32 - Stuporous part of time. Very much weaker.
8-6-32 - Subcutaneous fluids given because cannot take fluids. Involuntary defecation.

Much worse

8-7-32 - Continues progressively worse. Breathing irregular. Pulse faster and,

8-8-32 - Going downhill. Respirations labored and difficult. Expired at 3:10 A.M.

Autopsy

Edema, scars

Body is well-developed, fairly well-nourished, white female about 58 years of age, 162 cm. in length, weighing approximately 135 lbs. Narked edema of legs and lower abdominal wall. Scars just below patella and over tibia on both sides. Have serpiginous outline and are very thin suggesting cigarette paper.

Ascites, hydrothorax-pericardium

Peritoneal cavity 700 cc. turbid, golden yellow fluid. Appendix atrophic.
Pleural Cavities 800 c.c. fluid on right, 400 c.c. on left (slightly bloody). Pericardial Sac distended with about 250 cc. golden yellow fluid.

Syphilitic Aortitis

Heart 275 grams. Musculature brownish. No thickening or dilatation of ventricles. Musculature good turgor. Valves and lining no abnormalities. Several heaped up atheromatous plaques in root and arch of aorta; in between plaques, are several wrinkled scars, most wrinkles are parallel with long axis. In one place, wrinkling has stellate arrangement. Entire root and arch definitely thickened and vessels on outer surface dilated. Right coronary surrounded at orifice by plaque of atheromatous material which does not obstruct lumen to any great extent. Remaining portion of two coronaries quite normal.

Atelectasis, edema, congestion

Right lung 730 grams, left 550 grams. Both are partially collapsed at bases because of compression of fluid. Somewhat wet, considerable hypostatic congestion but no evidence of bronchopneumonia.
Spleen 250 grams, shows diffuse fibrosis?

Perihepatitis, hepar lobatum

Liver 875 grams, adherent to adjacent tissues, particularly diaphragm and chest wall. Adhesions not uniform dense fibrous structure but made up of

matted partitions and septa which enclose small collections of turbid or clear fluid. When perihepatic fibrous tissue is cleared away, it seems to come away in layers. Liver substance would seem to displace about 500 or 600 cc. of water. Feels like several cystic masses projecting from a hard, fibrous background. On cut surface, cystic (?) areas are nodules of liver substance. On single cross section, there are about 8 nodules of liver substance ranging from 1 cm. to about 5 cm. in diameter. All independent and general outline is oval or circular. Lobules are separated by bands of hard, white, fibrous tissue. Appearance consistent with so-called hepar lobatum.

Good Collateral Circulation

Portal vein traced to liver (not through liver substance). Omentum adherent to anterior abdominal wall and it, as well as round ligament and adhesions contain many enlarged veins. Not as large as usually seen in cirrhosis of liver but smaller size of veins is compensated by large number (?). Anterior chest and abdominal wall very vascular. On diaphragmatic surface of liver, there are many veins (only moderately enlarged). Around and extending along esophagus to bifurcation of trachea is mass of varicose veins of considerable size. Largest is about thickness of lead pencil. Very tortuous and form plexus about esophagus. About rectum and sigmoid is similar plexus but not quite so extensive. Entire retroperitoneal space reddened by generalized enlargement of all small veins. No particularly large veins found except near spleen, i.e. 1 or 2 about one-half as large as lead pencil. Entire omentum and bowel show generalized reddening and enlargement of veins (acute congestion).
Note: An old story in decompensated liver deaths, i.e. failure with apparently good collateral circulation. At autopsy, intra-abdominal collateral vein enlargement always more impressive than superficial changes.

Adhesions, thickening of bowel.

Gall-bladder imbedded in mass of fibrous surrounding liver. Gall-bladder dissected and bile and cystic ducts appear quite normal and are unobstructed.

Effect on Gastro-intestinal Tract of obstruction of portal circulation has been partially described. In addition, there is diffuse thickening of entire gastro-intestinal tract involving small bowel and colon (more marked in cecum). Here, bowel is heavy, edematous and thickened by fibrous tissue. Mucous membrane of colon has several heaped up reddened areas.

Pancreas hard, appears fibrotic, particularly in head.

Adrenals - no change.

Bladder - normal.

Genital organs - Uterus is about normal size. Some blood in cavity. Tubes normal. Ovaries atrophic.

Sclerosis

Aorta. Puckered, wrinkled scars in root and arch have been described. Lesions are irregularly present throughout thoracic aorta and upper abdominal. No sharp line of demarcation at lower limit. Entire aorta shows heaped up atheromatous plaques. Thickening of arch of aorta, as described, but no dilatation.

Mediastinum contains few black lymph nodes. No enlargement of abdominal or aortic Lymph Nodes.

Organs of Head and Neck - not examined.

Diagnosis:

1. Tertiary syphilis.
2. Hepar lobatum.
3. Chronic perihepatitis.
4. Portal obstruction with collateral circulation and edema (failure).
5. Ascites and bilateral pleural effusion.
6. Pericardial effusion.
7. Syphilis of aorta.
8. Syphilitic scars of skin.
9. Fibrosis of pancreas and spleen?
10. Acute and chronic congestion of bowel.
11. Edema and congestion of lung.
12. Cloudy swelling and congestion of kidneys.
13. Marked aortic sclerosis.

Comment:

Note how diagnosis of syphilis is made. Positive history (from daughter), positive complement-fixation tests of spinal fluid, cutaneous manifestations (old scars), interpretation of clinical picture (heart vs. liver as cause

of decompensation), pointed to liver but did not include heart (see high pulse pressure). Was there a cerebral lesion (see coma). Is this the result of insufficient treatment? The answer cannot be given until large series of treated patients are followed individually as in cancer follow-ups. Should a treatment card be carried by patient and presented when another physician is consulted or correlated with postmortem findings if death occurs from any cause?

Microscopic sections:

Heart - muscle shows no special changes, i.e., no areas of fibrosis, gumma or diffuse lymphocytic infiltration.

Lungs - congestion, edema, no bronchopneumonia.

Spleen - slight increase in thickness of trabeculae, no diffuse fibrosis.

Liver - cells appear uniformly normal (which one would expect); no gumma seen; marked increase in fibrous septae in portions; in certain areas, fibrosis is suggestively nodular in outline (healed gumma ?); few areas of focal lymphocytic infiltration within lobules.

Aorta - non-syphilitic sclerosis; no peri-vascular changes seen in sections examined (missed it?).

Bowel - marked edema, beginning fibrosis, marked diffuse lymphocytic infiltration (does this represent specific infection or is it secondary to portal congestion?).

Gall-bladder - normal.

Pancreas - slight increase in fibrosis-stroma, probably not significant.

Adrenals - slight postmortem changes.

Bladder - normal.

Ovaries - normal.

II. ABSTRACTS:

By Koucky.

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3. Diehl, H. S., Wassermann Reactions in College Students. Am.J.of Public Health, 21:1131-1135 (Oct.) '31.

4. Olson, B. J., Wassermann Survey of Minnesota General Hospital Records; Department of Bacteriology, Jan. 1, 1932 to Dec. 31, 1932.

5. Cheever, A. W., and Wheeler, W. D., Mistakes in Diagnosis and Treatment of Syphilis. New Eng. J. of Med., 205: 1249-1251, (Dec.24) '31.

6. Michelson, H. E., The Treatment of Syphilis. Journal-Lancet, (Mar. 15), '32.

1. CLINICAL PICTURE. (Stokes)

(1) Inoculation and Primary Incubation Period.-- No clinical signs of infection.

(2) Primary Stage.-- Chancre appears with wide variation in local reaction. Local lymphadenitis (bubo). Systemic symptoms (headache, bone pains, etc.) may appear in advance of outspoken lesions. Blood Wassermann reaction begins to come positive.

(3) Early Secondary Stage.-- Chancre begins to heal and widely distributed secondary skin manifestations develop with lymphadenitis, enlargement of spleen, bone lesions, changes in the nervous system, etc. Special structures may be attacked, as eye, ear, liver, kidney, with serious results. Refractory state develops, with positive blood Wassermann reaction.

(4) Late Secondary Stage.-- Secondary eruption disappears spontaneously, systemic manifestations subside. Some symptoms from local foci may persist, such as palpable spleen or liver, active but asymptomatic neurosyphilis, etc.

(5) Early Recurrent Stage.-- Any lesion of the primary and secondary period may reappear, but especially lesions on mucous surfaces. Primary lesion and secondary eruption may reappear if temporarily aborted by treatment.

(6) Latent and Late Recurrent

Stage.-- Prolonged absence of symptoms, or period of relative quiescence punctuated by relapse with lesions in bone, skin, mucous membranes especially. Lesions become fewer in number due to scarcity of spirochetes and more localized and destructive, as in late syphilis, due to developing allergy and vascular change.

(7) Late Syphilis, Gummatous Phase (Tertiary Syphilis).-- Tumor-like lymphocytic and granulomatous masses appear in various organs. Central necrosis from endarteritic ischemia, extensive sloughs, much destruction of parenchyma and scarring. Lesions not clinically infectious.

(8) Late Syphilis, Degenerative Phase (Quaternary Syphilis or Parasyphilis).-- Degenerative lesions of cardiovascular and nervous systems; fibrosis of parenchymatous structures, such as liver, spleen, pancreas, etc. Clinical changes and fatal results due to loss of parenchyma replaced by fibrous tissue, injury to the blood-supply, etc.

2. LATE MANIFESTATIONS OF SYPHILIS. (Bell).

Lesions of tertiary syphilis, classified as gumma or diffuse chronic exudative inflammation without necrosis (most common), the usual lesion found in aorta and central nervous system. Differential diagnosis from tuberculosis at times rather difficult. Gumma may be found in practically any tissue or organ of body but most frequent locations are bone, skin, liver and testis. Vary from miliary to several centimeters in diameter. Usually single but may be multiple.

Gumma have firm, elastic, yellowish central necrotic portion surrounded by dense fibrous or cellular zone of varying thickness. Peripheral zone shows some lymphocytes and plasma cells. Epithelioid cells present but less conspicuous than in tubercles. Giant cells also less regularly present. Most difficulty in distinguishing large lesions. Progressive lesions show extensive proliferation of connective tissue about periphery. In event of healing, necrotic tissue is absorbed and replaced by scar tissue.

Special organs:

Spleen - rare. Gumma vary in size, also splenomegaly with anemia.

Lymph nodes - most characteristic is gumma (uncommon). Usually associated with adjacent lesions (mediastinum)

Myocardium - rare. Gumma or diffuse exudative inflammation. Fibrous tissue replacement usually due to coronary disease. Syphilis considered if large numbers of lymphocytes are present. Most common effect is anemia due to narrowing or closure of coronary orifices.

Aorta - Most common tertiary lesion in acquired syphilis at autopsy. May be found alone?, or in individuals not suspected of having disease. Usually begins short distance above aortic valve and ends abruptly in upper part of thoracic aorta. May extend further (see our case). Abrupt termination is of great diagnostic importance to pathologists. Appearance rather characteristic. Microscopic lesions, lymphocytic infiltration, chiefly of adventitia but also to notable extent of media. Gumma rare. Effects - narrowing of coronary orifices, aneurysm, involvement of aortic valves (aortic regurgitation).

Small vessels - Arteritis may develop in any, characterized by lymphocytic infiltration of wall. Vessels of brain especially apt to show these changes and infarction not uncommon, (see coma in our case?).

Nose - Tertiary lesions rather common. Gumma or ulceration may cause destruction of septum, necrosis of ethmoids resulting in meningitis or perforation of hard palate.

Larynx - Tertiary lesion most important. Diffuse infiltration with necrosis and ulceration. Healing may be followed by stenosis. Mistaken for malignancy?

Lungs - Rare. Gumma may occur. Areas of extensive fibrosis sometimes interpreted as syphilitic?

Mouth - Chronic glossitis frequently syphilitic. Tongue indurated, fissured areas of leukoplakia or gummatous nodules. Carcinoma frequently develops on old luetic glossitis. Ulcerative lesions resulting from gumma on palate or tonsils may resemble carcinoma.

Stomach - Syphilis rare as postmortem finding. Sometimes seen during life?

Intestines - Most common site of involvement is rectum (ulcerative lesion with diffuse infiltration of wall). Scar tissue commonly produces stenosis and clinical picture difficult to distinguish from carcinoma. May not be possible to distinguish syphilis from non-specific inflammation microscopically.

Liver - multiple gumma frequent and as result of deep scarring from healing may become lobulated (hepar lobatum). Extensive diffuse infiltration gives rise to coarse cirrhosis (syphilitic cirrhosis) which sometimes gives clinical picture of Laennec's.

Pancreas - Gumma and diffuse syphilitic lesions found in some cases of acquired syphilis.

Urinary tract - Involvement rare.

Female Genitalia - Tertiary infiltration of cervix may be difficult to distinguish from carcinoma (also true of chancre). Treatment of chancre (radiation) usually attended with very bad results. Active lesions of body rare. Practically unknown in fallopian tubes. In vagina, gummatous infiltrative lesions not common.

Testicle - Not infrequently involved in late stages of acquired and congenital syphilis. Usually diffuse infiltrative type, but typical gumma are common. Epididymis ordinarily not involved except by extension.

Skin - Gumma not uncommon, frequently mistaken for tumors. May be multiple but seldom very numerous. Ulceration may occur.

Joints - Appear as multiple firm tumors developing in bursae over ankles, elbows, etc.

Bones - Tertiary syphilis not uncommon. Calvarium may show destructive lesions, often extensive ulceration of overlying soft parts. In long bones, gummatous lesions may be difficult to distinguish from osteogenic sarcoma. Other forms are diffuse productive osteoperiostitis which brings about condensation and uneven enlargement of bones.

Nervous system - Neurosyphilis is one of most important diseases of nervous system. Usually a manifestation of tertiary acquired syphilis, rarely of congenital syphilis. Not as common as syphilitic aortitis in necropsy records, but more frequent clinically. May be involved early. Symptoms usually appear only after a few years of time of infection. Types: Cerebrospinal syphilis, tabes dorsalis, general paresis. In secondary lesions there is enthematous change, inflammatory and vascular changes and sequelae (encephalomalacia, gumma, hemorrhage, meningitis, pachymeningitis, cervicalis hypertrophica myelitis, Erbs syphilitic spastic paraplegia, etc.)

Congenital Syphilis: Note the 3 types (or 4).

Fetal type - Skin macerated, no bullae can be seen, or bullae present; most numerous on palms and soles. Usual gross findings at postmortem are enlargement of spleen (almost constant) and of the liver (usual). In event that postmortems cannot be done on suspected syphilitic cases, x-rays of the body are indicated. Microscopic sections of liver show intralobular cirrhosis, spleen-macrophages filled with hemosiderin, pancreas-extensive lymphocytic infiltration sometimes cirrhosis and other changes. So-called "nephrogenic zone" persistence not a sign of syphilis but of prematurity. Dubois' abscesses of thymus (non-syphilitic).

Infantile Type. - Continuation of fetal infection in which child lives longer. Chief clinical signs are coryza, pemphigus, splenomegaly and anemia. Osteochondritis may persist. Liver frequently shows cirrhosis. May be accompanied by ascites or jaundice. Changes in spleen, kidneys and pancreas similar to those of fetal type.

nervous system, syphilitic meningitis and areas of softening have been described. Rarely involvement of eyes. This type may recur between 2 and 4, a recurrence after temporarily successful treatment (see acquired form). Chief signs are condyloma of skin (usually around anus) and gumma in any part of body.

Late type: Principal findings are deafness, Hutchinson teeth, periostitis, keratitis, splenomegaly and neuroretinitis. Occasionally neurosyphilis may develop.

Comment: While late lesions are stressed because of hospital experience, primary and secondary (with recurrences) are equally if not more important in out-patient and office practice.

3. WASSERMANN REACTIONS IN COLLEGE STUDENTS. (Diehl)

Estimates as to the incidence of syphilis among the general population of this country enormously vary. The studies which have been made concerning the incidence of syphilis have been based upon 3 types of data: the number of cases actually under treatment in a given locality, the proportion of syphilitics among the patients of general hospitals or clinics, and the results of routine Wassermann tests of groups of supposedly healthy individuals.

Incidence of Clinical Syphilis: Stokes and Brehmer (1920), Mayo Clinic - 1563 consecutive patients. 3% had syphilitic infections sufficiently obvious to be detected without the use of the routine Wassermann tests. According to occupational groups, male railroad employees 12%, laborers 6%, business men 4%, and farmers 2%.

Parran, Smith and Collins, U.S. Public Health Service, (1918) found .7% of population of 9 cities and 5 counties in 4 states were under treatment for syphilis at same time. King, 1.6% of the enlisted personnel of the U.S. Coast Guard were under treatment for syphilis in 1929, Stoner in general hospital patients 5% (white) but that there has been a large decline in the last 5 years.

Wassermann Reaction: This test, while not infallible, is a valuable aid in the diagnosis of syphilis; in fact, at certain stages of the disease it may be the only demonstrable evidence of infection. In late syphilis, particularly of the central nervous system, a negative blood Wassermann is not infrequent, but earlier in the disease the percentage of error is small. Stokes found blood Wassermann's negative in 53% of patients with late syphilis; Duke - negative reaction in 5% of patients in whom chronic late syphilis could be demonstrated otherwise, and Dodd .7% of 200 pregnant women syphilitic in spite of negative Wassermanns.

Wassermann Results Among Students: (University of Minnesota). Cases giving positive reaction are retested several times. Students whose blood gives doubtful positive reactions are studied clinically and the blood rechecked from time to time. 5000 routine blood tests done - 10 positive; 5 doubtful excluded by clinical study and rechecking Wassermanns.
Rate: 2% positive (boys 0.17%, girls 0.25%). 5 females - 5 males.

Clinical Reports: Only 1 of 10 was aware he had syphilis.

1 - knew of infection
2 - suspected possibility
2 - had treatment past or present but did not know for what purpose
1 - headaches (4 years)
2 - history of penial lesion
1 (boy) - lesion in mouth after use of pipette in drug store
1 - no signs

Physical examination:
2 - congenital stigmata
1 - penial scar
1 - secondary anemia

Stokes and Brehmer report 24% of their patients gave no history of primary lesion and 63% had observed no secondary symptoms.

Comment: Although incidence of syphilis varies in different social,

economic, occupational, and intellectual groups, Dublin and Clark concluded that no less than 10% of population of our large cities have been infected with syphilis, and that "this percentage may well prove to be a safe estimate for the country at large." Since that time, the incidence of syphilis has declined somewhat in the army and probably in the civilian population; although Detweiler at Toronto General Hospital, who noted a decline from 1916 to 1921, states that from 1921 to 1925 the figures remained constant. The incidence of .2% in this student group is but a small fraction of what one would have reason to expect in the general population.

In a similar but older group, the incidence rate probably would be somewhat higher; although the group of 6,450 recruits (Levin) showed incidence of positive Wassermanns of 11% ranged from 21 to 31 years; and Wassermann survey of negroes in Mississippi showed the highest incidence of syphilis in 30 to 39 year group and next in the 20 to 29 year group. The fact that these students had the intellectual capacity and ambition to reach the upper classes in university adds selection in certain regards. Socially and economically, however, they come from practically every group in the community; in fact, 40% of boys and 13% of girls are totally self-supporting; and all are probably representative of the more intelligent portion of our population.

Wassermann Surveys:

No. Examined	Group	Place	Year	Sex & Color	Per Cent Pos.Wass.
12,115	Hospital patients	Toronto	1916-1925	Male-white	7.
				Female - white	5.
1,307	Hospital patients	Germany	1923	Both sexes - white	7.
-----	Clinic patients	Mayo Clinic	1930	Both sexes - white	4. - 6.
2,000	Pregnant women	Edinburgh	1927	Female - white	7.
4,000	Pregnant women	Baltimore	1920	Female - negro	16.
				Female - white	3.
2,509	Rural	Mississippi	1929	Male - negro	24.
				Female - negro	24.
8,004	Prisoners	San Quentin,Cal.	1928	Male - white	7.
				Male - negro	18.
				Male - Mexicans	16.
				Male - Yellow race	24.
6,450	Soldiers	Camp Funston Fort Riley	1919	Male - White	11.
1,019	Recruits (less than one week in army)	U.S.A.	1915	Male - white	17.
621	Student cadets	West Point	1915	Male - white	6.
721	Cadet officers	Training Camps	1919	Male - white	0.6
3,203	Cadet officers	Training camps	1919	Male - white	6.

The incidence of positive tests among white males varies from 6% to 17%, and among white females from 3% to 7%.

4. WASSERMANN SURVEY OF MINNESOTA GENERAL HOSPITAL RECORDS. (Olson)

The Wassermann record book in the fourth floor laboratory is studied. 1797 (1800) records (consecutive) are analyzed. An attempt is made to compare the Kolmer reactions on blood and spinal fluid as done by the laboratories of the State Department of Health and the Department of Bacteriology (State Board vs. Larson). Only cases in which specimens are divided and sent to both laboratories are used for study. A few duplicates (probably about ten) are included. No attempt is made at this time to separate blood and spinal fluid reports except as indicated.

There is agreement in the report on 1,675 cases (93%), i.e. both laboratories called the same specimen positive or negative. There is disagreement in 7% (122 cases). In the latter group, Larson positive 79, negative 43.; State Board positive 43, negative 79. This group is of special interest because 65% of the specimens are spinal fluids, a very much higher proportion than is represented in the whole group. When the spinal fluids alone are studied the agreement-disagreement distribution is exactly 50-50. Comment: This remarkable agreement-disagreement ratio 93-7 in specimens sent to two different laboratories is approximately the same as the same specimens examined in one laboratory (other studies elsewhere show 94-6, 95-5.)

The number of positives in the entire group (1,797) is 5%. If the group in which one or the other laboratories returned a positive is included, it is 12%. Probably the actual number is somewhere between? Note the remarkable similarity in the number of positive Wassermanns in our experience compared with other series where similar types of patients are probably seen (Mayo Clinic). The number of positive Wassermanns from the rural districts is probably lower than urban tests so the residence should be included in differential studies.

At the present time charts of the 122 cases in which the laboratories failed to agree are being studied for (1) history of infection, (2) symptoms, (3) signs and (4) treatment. Many of the records do not indicate that syphilis was considered in summing up the diagnosis on the outside sheet. It is only by finding the names in Wassermann report book that we have been able to make this study. None of the out-patient records are included unless the patients were sent into the house for special investigations.

5. MISTAKES IN DIAGNOSIS AND TREATMENT OF SYPHILIS. (Cheever & Wheeler)

In the practice of syphilology lack of knowledge constitutes a grave public health problem and is responsible for the spread of a serious disease in the community and for its transmission to the generation to come.

Within the past three years there have come to the attention of the authors over a hundred such mistakes which clearly demonstrate the following points:

1. That the physicians who first saw these cases knew few of the rudimentary requirements for the diagnosis of primary syphilis. Unbelievable as it seems, many of these physicians had no knowledge whatsoever of the dark-field examination; that is, the use of the microscope to determine the presence of the Treponema pallidum.

2. They were not "syphilis conscious", seldom suspecting syphilis; they failed to recognize its manifestations in the late stages. They never resorted to the help of serologic examinations, such as the Wassermann, Kahn, or Hinton tests.

3. Their knowledge of the therapeutics of syphilis was tragically inadequate and obsolete.

4. They were totally unaware of the progress made in the diagnosis, treatment, and laboratory research in syphilology.

Conclusions:

1. Consider every genital ulcer as syphilitic unless definitely ruled out by repeated dark-field examinations.

2. Remember that extragenital chancres are not uncommon and may be located anywhere on the body.

3. Bear in mind that a chancre in a woman may be hidden within the vagina. A painstaking, thorough search should be made in all cases.

4. Have routine laboratory blood tests, such as the Wassermann and Hinton, made on the blood of all your patients, and don't forget that one negative test does not rule out syphilis.

5. Have the blood of every pregnant woman examined for syphilis early in pregnancy. A positive blood test would indicate immediate treatment for the expectant mother and incidentally for the fetus.

6. The time to discover a congenital syphilitic and begin treatment is before the syphilitic is born; that is, treating the syphilitic mother early in pregnancy, all through pregnancy, and then continuing the treatment of the child from its birth for a long number of years.

7. Treatment in all cases of syphilis should be prolonged, intensive when necessary, and always in keeping with modern procedure and progress. One negative blood test during treatment does not mean a cure. About two to five years is necessary before a probable cure can be effected. In most cases lifetime observation of the patient is advisable.

8. Examination of spinal fluid is essential in every case of syphilis, and is often the only means of detecting incipient neurosyphilis.

9. Always suspect syphilis. In any of its stages it may simulate other diseases.

10. Whenever in doubt concerning the diagnosis of syphilis consult a syphilologist.

6. THE TREATMENT OF SYPHILIS

(Michelson)

There is no one treatment for syphilis. One is treating individuals infected by a virus which is capable of attacking almost any tissue in the body. The age, sex, size and weight of the patient, age of the infection and type of involvement as well as the ability of the patient to tolerate the drugs used must be considered. The treatment must be individualized and made to fit the case.

It is impossible to try to outline a treatment for syphilis in so many doses of so many grams each of this chemical and that drug. The treatment for an uncomplicated case of primary syphilis is entirely different from that which is to be administered to a person suffering with parenchymatous nervous system lues.

The leaders who have much material at their disposal and who have critical and analytical minds, must crystalize their opinions at regular intervals; and they must be the ones to bring their messages to the general practitioners.

Are we trying to treat individuals who have syphilis in order to bring about a cure, or are we trying to extinguish a plague? As practitioners, the duty is to the individual. If extinction is the goal, then the responsibility must be borne by the state, and the infected individual's rights must be entirely secondary to the public good. This would reduce every infected person to the position of a prisoner, or at least to that of a closely observed, paroled man. It would entail great individual hardship and mental anguish, and it is doubtful, even if such a plan were in force, if the disease could be exterminated.

Properly administered, effective, early treatment quickly renders the individual non-infectious, and probably will accomplish fully as much in a very much easier way. Therefore, all practitioners must be on the lookout for early infections; they must know what the proper diagnostic procedures are, and must try to simplify the initial courses, at least, so that the infective period will be as short as it is possible to make it.

In the treatment of syphilis, we depend upon the arsenicals, bismuth,

mercury, iodides, and certain non-chemicals such as inoculation of malaria.

For practical purposes there is not enough difference in the various types of arsphenamines to go into any details concerning them. The arsenicals are so well standardized that most of the trouble ascribed to this or that drug is usually due to one's inability to discover and understand intolerances or complications.

It is almost impossible to routinize the treatment of syphilis, but one must try to establish, if possible, a minimal total dosage and period of treatment. We do not know the optimal amount, and obviously the maximal has not been set.

The treatment of syphilis may be discussed under various headings:

Prophylaxis: When a person has had a known exposure, either sexually or accidentally, and arsenical treatment is begun within a few hours, a very few injections are positive protection against the development of the disease. Professor Oppenheim, of Vienna, advocates the use of Spirocid, an arsenical devised for oral administration, for this purpose. General venereal prophylaxis is another procedure. It calls for private or public facilities for the administration of local chemical prophylactics after every sexual exposure, and is as is well known, effective. Just how efficient the local use of mercury is in preventing the development of syphilis is not known, for every person venereally exposed to syphilis does not develop the disease.

Abortive Treatment: Can syphilis be aborted? The European leaders are more inclined to recognize abortive cures than we are. It calls for an early infection, only a chancre manifest, with positive identification of the spirochetes, and with a negative blood Wassermann reaction both before, during and after treatment. One should never speak of syphilis as being a local disease. Many workers have shown that spirochetes can be found in the blood stream, and even in the spinal fluid before the Wassermann reaction is positive, and before visible lesions are present.

Abortive cure calls for a minimum of eighteen months of treatment consisting of at least eighteen injections of arsenicals, and thirty-six injections of bismuth. Abortive cures must be given with great reserve, and the period of post-treatment observation must be close, constant, and frequent.

The Department of Syphilology, University of Minnesota, feels that abortive treatment receives too much emphasis. The idea is appealing to both physician and patient but in truth is rarely practical. In practice, the "abortive cure" should probably be discarded and such cases treated as described for "early treatment."

Early Treatment: By early treatment is meant treatment begun in the early stage (first six months) of the disease. At this stage, the treatment can be routinized more easily than at any other time. The active, established early case of syphilis, between the third and ninth month, should be treated for a period of about three years.

Why do we say three years? These conclusions are the result of a careful study of the statistics of clinics such as Jadassohn's in Breslau, Finger's in Vienna, the Mayo Clinic, Michigan, Pennsylvania, Minnesota, and many others.

In the three-year period the patient should receive approximately forty injections of arsenicals, and one hundred injections of bismuth. This may be accepted as today's standard, but this may all be changed tomorrow, and our knowledge along this line is in a constant state of flux.

Late Syphilis: In late syphilis, one is dealing with individuals who may, or may not, have had some treatment in the early stages of the disease.

What is the difference between the treatment of early and late syphilis? The difference depends

upon the fact that the longer the spirochetes are in the body, the more vitally injured are some of the organs that they infest and treatment at this stage must be administered with regard for seriously damaged viscera.

When one begins treatment for the most insignificant tertiary manifestation one must be alert for upsets, because there is no way of knowing what internal involvement there is. That may become manifest only under the influence of treatment. The more powerful the drug and the greater the initial dose, the more severe is the reaction; hence, in all late, as well as early, syphilis one begins treatment with minute doses of a mild drug like bismuth. We thus either prevent the reaction entirely, or it takes place in a very mild manner. If a patient who presents himself with a late nodular lesion in the arm receives a large dose of neosalvarsan as the initial injection, and his liver function is impaired by syphilis, a severe hepatic Herxheimer reaction may endanger his life.

One cannot emphasize too much the need of a most careful examination before beginning treatment in tertiary syphilis: the blood, spinal fluid, competent heptatic and cardiac examination, an opinion of the eye grounds are necessary. If one starts against late syphilis with heavy blows, one comes to grief. Begin with small doses, find out how the patient tolerates the drug, and one will avoid unduly injuring impaired organs.

Congenital Syphilis: We must realize that the problem of treating congenital syphilis is quite different from that of treating acquired syphilis of the adult, because the little patient has been infected at a time when his tissues had very little ability to combat infection. The immunity-producing processes are probably not very active, and we find very few organs spared.

In treating congenital luetics we must not interfere with the natural growth of the child, hence treatments must be suited to the patient even more so than in the case of adults. Cooperation must be secured through the employment of a refined technique. Every procedure must be as nearly technically perfect as possible. These little patients resent being hurt; their morale is easily shattered. Therefore, I say, use as painless a treatment as possible, without sacrificing effectiveness.

In congenital syphilis treatment must be longer, more carefully directed, and the aid of the pediatrician is essential for the best results.

Special cases: Control, or amelioration, of symptoms is more important than an effort to "cure" the disease. This is so in certain cases of aortitis and hepatitis. If a patient comes in with aortitis, it is much more important to keep his heart and aorta functioning than it is to cure the syphilis.

"Nerve" Syphilis: Syphilis of the nervous system is a different problem than syphilis in other organs. The first attack against nervous system syphilis, when not previously treated, is the general treatment as mentioned. In cases which do not respond we have special measures, such as tryparsamide and fever therapy to fall back upon. These types of treatment should be reserved for the experienced therapeutist.

Wassermann-Fast Cases: One of the most difficult problems is the symptomless patient with a persistently positive Wassermann reaction. A most thorough search for focal evidence should be made. Past treatment should be carefully weighed. Future courses should be mapped out in such a way that the point where treatment will cease is thoroughly impressed upon the patient, and from there on, unless some symptom or finding arises no further treatment should be administered. The patient becomes an observation case, when what you consider the maximum amount of treatment over a reasonable length of time has been administered. The treatment should never be continued indefinitely just because of a persistently positive Wassermann reaction.

Generalizations: The earlier the treatment begins, the better is the prognosis. Never wait to begin treatment, once the diagnosis is clearly established, no matter how early the stage of the

disease. The dark field is positive long before the Wassermann reaction becomes positive.

The arsenicals are the most potent drugs and no patient who can tolerate arsenic should be denied them in adequate amounts.

Bismuth is a valuable drug and should be combined with arsenicals. Arsenic plus bismuth has been found more efficacious than arsenic plus mercury. Bismuth is much more easily borne.

Mercury still is a valuable drug; especially inunction for individuals who cannot attend regularly for treatment.

If the first year's treatment is carried out with the greatest regularity, relapses will be very few; the patient derives more benefit from the drugs administered, they are better borne; and, there is less chemical damage to the tissues.

In administering the arsenicals do everything possible to make the patient tolerate the drug. In case of impending intolerance manifest by nausea, etc., try smaller doses, greater dilution, longer intervals, etc. There is a definite relationship between dosage and curability.

Keep in mind constantly the fact that you are treating an individual infected with a chronic disease, and that the patient must be cured if possible, but he must not be injured by treatment.

Discuss the cost of treatment in courses, not by single injection.

One must be progressive--ever ready to accept new methods or procedures, but only after they have been thoroughly evaluated by people who have the knowledge and opportunity to study them carefully.

Every practitioner who undertakes the treatment of syphilis should know about what the accepted standard of the day is. He should know the dangers of the drugs that he is using, and he should, above all else, know that the patient needs all of the benefits of the art as well as the science of medicine.

FACTS OF INFECTIOUSNESS

(Stokes)

1. The more recent the infection, the more dangerous.
2. The blood Wassermann reaction is not a guide to infectiousness or non-infectiousness. It may be negative with infectious lesions present and positive in non-infectious cases.
3. The most infectious lesions are: chancre, mucous patch, condyloma, moist papule (flexures).
4. The places to look for infectious recurrent lesions in inspection are: lip (outer and inner surface), angles of mouth, faucial pillars and tonsils, sides and bottom of tongue, axilla, nipples, inguinal folds, labia, penis, scrotum, anus (piles).
5. All open or eroded lesions in early syphilis are dangerous.
6. Infection is also transmitted by semen and by benign non-syphilitic lesions (herpes) in patients with syphilis.
7. Syphilis is transmitted mainly by intimate contact of moist surfaces; i.e. by kissing, sexual intercourse.
8. Moist articles and discharge-bearing dressings and articles of common use can also carry infection.
9. Thorough washing in hot water and soap disinfects contaminated objects. The additional precaution of boiling dishes, utensils, and such articles as douche nozzles, instruments, etc. in soda solution may be used.
10. Dry objects, and dry (not crusted) lesions are non-infectious.
11. Pyogenic infection reduces the infectiousness of the local lesion.
12. Trauma by an infected object (knuckle striking teeth, needle prick) makes infection almost certain; it may be hematogenous and without chancre.
13. Transfusion is a means of trans mitting syphilis. A single negative blood Wassermann test in the donor does not protect.
14. There is a distinct infectious relapsing type of syphilis that must be watched for. To such a patient, no assurances can be made.
15. Local irritation favors infectious recurrence; dirt, sweat, discharge friction (intercourse), tobacco (smoked or chewed).

16. **Time diminishes the infectiousness of syphilis.** After five years, few cases are infectious; desultory, non-curative treatment, with relapses, may prolong infectiousness many months or years. No treatment can guarantee the non-infectiousness of syphilis indefinitely.

17. Secondary relapses have been seen with general paresis after twenty years. Inadequate treatment favors infectious relapse.

18. Late syphilids are not infectious even though open lesions are present. Do not confuse with recurrences.

19. Mercury does not control infectiousness.

20. Bismuth, while more effective in this respect than mercury, is probably less so than arsphenamin.

21. Arsphenamin controls infectiousness, probably as long as one month from the last dose.

III. PERSONAL

1. Report of the President for the Biennium 1930-32, Bull. of the Univ. of Minn. XXXV, (64), (Dec. 1,) '32, lists among other things resignations 1931-32, specifically states at length the University's regreat at the leaving of only one man, the former Superintendent of our Hospital.

"Mr. Paul H. Fesler, who has served the University for five and one-half years as superintendent of the University Hospitals, resigned to accept the headship of the Wesley Memorial Hospital of Northwestern University, Chicago, Illinois. His resignation was accepted with regret.

During his administration of the University Hospitals the Eustis unit was built and the Students' Hospital likewise was constructed and made a part of the general hospital system. Mr. Fesler's knowledge of hospital structures was of great value to the University in planning these buildings. Mr. Fesler's especial genius was displayed even more effectively in the harmony which he secured among all the individuals and agencies using the University Hospitals and in the public relations and contacts that he established with representatives of the medical profession, county commissioners, the judges of probate courts, and citizens generally throughout the state.

Mr. Fesler has been succeeded by Dr. Halbert R. Dunn, an alumnus of the University of Minnesota, a doctor of medicine, and a doctor of philosophy, who has been the statistician for the Mayo Clinic at Rochester, Minnesota."

2. Exchange lectures.

Mayo Foundation to Medical School, Medical School to Mayo Foundation. Excellent plan for exchange of views and opportunity to hear noted men. One of the many fine things conceived and developed through the cooperative efforts of the Mayo Foundation and Richard Everingham Scammon, Dean of Medical Sciences.

Mayo Foundation Lectures, 1933

Todd Amphitheater,
University Hospital
3:00 P.M. on dates below:

Jan. 31.	R. M. Wilder, "The Treatment of Obesity"
Feb. 14.	F. A. Willius, "Coronary Arterial Disease"
Feb. 28.	W. C. Alvarez, "Which Are the Indigestible Foods?"
Mar. 14.	F. C. Mann, "Observations on Experimentally Produced Peptic Ulcer"
Mar. 21.	E. C. Kendall, "Chemical Investigations of the Suprarenal Gland"
Apr. 11.	W. F. Braasch, "Diseases of the Nervous System Involving the Urinary Tract"
Apr. 25.	D. C. Balfour, "Surgery of the Stomach and Duodenum"

Medical School Faculty Lectures, 1933 at Mayo Foundation.

Plummer Hall,
Tuesday evenings at 7:30.

Jan. 24. E. T. Bell,
"The Relation of Nephrosis to Nephritis."

Feb. 7. R. N. Bieter,
"Comparative Physiology of the Kidney."

Feb. 21. G. E. Fahr,
"Correlation of normal and Pathological Anatomy and Normal and Pathological Physiology of the Kidney with Clinical Signs and Symptoms in Nephritis."

Mar. 7. G.O. Burr,
"Fat Metabolism.

Mar. 21. O. H. Wangensteen,
"Acute Bowel Obstruction"

Apr. 4. R. E. Scammon,
"Growth of the Human Vascular System."

Apr. 18. Hal Downey,
Title later.

3. Surgical Fellow Harold Joseph Dvorak,
while at the Mayo Clinic discovers oldest example of Arachnodactylia on record. See - Proc. of Staff Meet. Mayo Clinic, 7:715-717, (Dec.14), '32; Bull. - Staff Meet. Minn. Gen. Hosp. III:70-75, (Nov. 12,) '31. Chief complaints - muscular weakness, instability of ankles, high grade myopia, tall stature and marked thinness. The hands and feet were long and spider-like, feet clubbed, congenital dislocation of lens and cardiac findings. Had been classified as example of abiotrophy with the possibility that it belonged to the Charcot-Marie Tooth type. The similarity of the findings in two patients is striking.

4. Mighty Bear Hunter Charles Henry Mead, Jr., Bull. Gen. Staff Meeting, Minn. Gen. Hosp. IV: 102, (Dec. 15), '32, receives letter from father of children who owned tame bear shot last fall. The children are crying, the mother is heart-broken, the father is mad and asks for $100 damages. "Brother, can you spare a dime?" is the popular song of the day as he ponders the request.

5. E. B., age 18, came to Out-Patient Department 12-23-32 with the story that a swelling which has been present over his right eye for 18 years was now painful and increasing in size (past 6 months). He said that the hard, pulsating tumor whic resembled a dermoid cyst was due to a piece of wood which was driven into his forehead as a baby. He was right. Microscopic sections showed the wood, foreign body reaction with marked vascularity. There is an old axiom in Medicine "ask the patient what he thinks is the cause of his trouble." He may not always be right but sometimes he is very helpful.

6. E. D., age 27, M3, shows classical picture of "pituitary basophilism" - trunk obesity, postural change, backache, trip to chiropractor, bluish-red facies, beard, amenorrhea, osteoporosis, hypertension, headache, diabetes, erosion of posterior clinoids. The evolution of syndrome is most interesting, general appearance of diagnostic patient, and disturbance in other glands of internal secretion striking. See Medical Fellow Luther Calvin Fisher, (also Bull. - Minn. Gen. Hosp. IV: 48-52, (Nov. 10), '32.

7. State Sanatorium Society Members,
meet at Minnesota General Hospital Friday, Jan. 27th, 10 to 12. Luncheon at Hospital follows. Theme for discussion (among other things), Diagnosis and Treatment of Tuberculosis of Bones and Joints. You are welcome to attend.

IV. MEETING

Date: January 19, 1932.

Place: Internes' Lounge, 6th Floor,

West Building.

Time: 12:08 to 1:37.

Program: Diagnosis and Treatment of Tuberculosis of Bones and Joints.

Present: 115. (New High)

Discussion: H. S. Diehl
L. G. Rigler
M. S. Henderson (special guest)

Theme:

H. S. D.: I noticed an article in the J. A. M. A. last week or so concerning value of hyperventilation in reducing postoperative pulmonary complications. Certain conclusions were drawn which if the person had applied good statistical methods, it did not mean anything. Difference between series was less than you could get by chance. Statistics are not an end in themselves; use common sense with them.

L. G. R.: Very large series of films on girl. First ones taken in Out-Patient Department, 10 days before entrance to hospital. Two hips and chest in which we were unable to find any destructive hip process. Neck of femur, joint apparently clear, head of femur entirely normal, destructive process being confined entirely to neck. Little sequestration at this point, other hip perfectly normal.
Diagnosis: Osteomyelitis, sometimes called epiphysitis though epiphysis is not effected. Taken after operation, latter part of July, considerable increase in sclerosis, numerous areas of destruction. Taken month or so later, areas of destruction and sclerosis.

Still a month later, developed process in wrist. You can see clearly where soft tissue swelling is present. No involvement of bone or cartilage though it cannot be excluded. Next films taken several months later and show femur after it has been put up in cast, shortly after guinea pig inoculation (positive). Three months later, (cast off), two definite abscesses with sclerosis, probable partial fracture following biopsy (drill), little fragment displaced, seems to be separating.

Last film of hip taken other day. Distinct absorption of cartilage but no destructive process. Good deal of healing taking place. Areas of rarefaction, not quite so much sclerosis. Destruction of cartilage and some absorption of end of radius shown here (wrist). This was thought to be pyogenic arthritis when first seen but when you see slow progress, period of 2-1/2 months, tuberculosis is much more certain. Nothing in earlier films to suggest tuberculosis.

M. S. H.: I am much interested in this biography. Some things I didn't know about. Some you do not know. I want to congratulate you on these meetings. They are a fine thing. I have learned that fusion operations are the thing to do in the majority of cases. When you look through literature and find what happens to people with tuberculous joints, you will learn results of treatment seem better than you expect.

Diagnosis of tuberculosis in last decade (only) has been good. If we use all means at our command we should be able to diagnose vast majority of lesions before we do fusion operations. I have just been reading about hip joint. Old literature gives quite good results but when you read case reports many of them are not tuberculosis. They have thrown in many other diseases. If you throw out those cases you will find result of conservative treatment in tuberculous joint is very poor.

In a series of cases of hip joint tuberculosis, it is astonishing that only about 2 out of 100 really had ankylosis. 20% had arrested disease but most of them continued to have trouble after years of conservative treatment. Fusion operation advised. Treatment will become more generally used. I think no one has put up any argument of real worth for conservative treatment. Arguments against operative procedure are dissemination of disease. Some truth in this, particularly in children?

There are definite types of operations: Arthrodesis - cartilage removed, bone exposed, and head put back into acetabolum. Mechanical part of operation difficult to fulfill satisfactorily, i.e., to get the head to fit acetabolum. Then there are two types of extraarticular arthrodesis: para operation and juxta arthrodesis. Para operation takes bone graft from tibia and grafts it from the ilium to the trochanter. Juxta where you you do graft from ilium to neck of trochanter. Third type of arthrodesis combination.

Good to clean whole thing out regardless of dissemination and in addition use bone graft. It is impossible to keep from contamination, but to a certain extent it can be done with adequate drainage. Also cut down convalescence period greatly.

As regards spine, not much to say. Any bone grafting operation or Hibb's operation but not curable. Unless you can get ankylosis of vertebra to vertebra, patients will continue to have symptoms. That is not true of all of our cases, however.

Elbow joint, not weight bearing. Patient has chronic tuberculosis, giving very little trouble, put up with little stiffness rather than have a fusion operation and dissection, so I do not always advise operation. Synovectomy turns out well. Tuberculous arthritis - synovectomy may be done but would not recommend it. Shoulder - if not causing trouble, would advise leaving it alone. Arthrodesis of shoulder can be done, however, if necessary.

Ankle joint - problem. More failures in operating upon tuberculosis of the ankle joint, up against difficulty. Expose ankle joint, do a good job of removing all tuberculous tissue as you do in the hip. The only thing to do is to tear it up until you get nothing but a mess of crumbling pieces of bone, slide down bone graft. If you get anything get bony fusion. You will rarely have failures in fusion. Spongy bone will take much quicker, has been proved, also in decalcification.

Note: One of the outstanding meetings of the year.

Gertrude Gunn,
Record Librarian.