



# Fever Therapy In Syphilis

*Richard E. Scanlon*

INDEX

|                                     | <u>PAGE</u> |
|-------------------------------------|-------------|
| I. OUR GUESTS TODAY . . . . .       | 240         |
| II. LAST MEETING . . . . .          | 240         |
| III. ABSTRACT                       |             |
| FEVER THERAPY IN SYPHILIS . . . . . | 240 - 248   |
| IV. HIS REPLY . . . . .             | 248         |
| V. NAMELESS ORPHANS . . . . .       | 248         |
| VI. MOVES . . . . .                 | 248         |
| VII. BOY AND GIRL . . . . .         | 249         |
| VIII. INTEREST GROUPS . . . . .     | 249 - 251   |
| IX. MOVIE . . . . .                 | 251         |
| X. OUR GUEST NEXT WEEK . . . . .    | 251         |

COURTESY OF CITIZENS AID SOCIETY

## I. OUR GUESTS TODAY

Howard Wilcox Haggard,  
Associate Professor of Applied  
Physiology, Yale University

\* \* \* \* \*

Paul Arthur O'Leary,  
Professor of Dermatology,  
Mayo Clinic

\* \* \* \* \*

Fellows of the Mayo Foundation,  
Rochester

\* \* \* \* \*

## II. LAST MEETING

Date: March 19, 1936

Place: Recreation Room,  
Nurses' Hall

Time: 12:15 to 1:20 P.M.

Program: Movie: The Management  
of Pneumonia.  
Pneumococcic Pneumonia

Present: 112

Discussion: E. F. Roberts  
H. A. Reimann  
J. A. Layne  
R. W. Koucky  
I. McQuarrie  
L. G. Rigler

## III. ABSTRACT

### FEVER THERAPY IN SYPHILIS

Francis W. Lynch

Since artificial fever is now being used in the treatment of many diseases and mechanical devices for producing fever are coming into general use, it may be well to review the knowledge which has resulted from 20 years' experience with the use of fever in the treatment of syphilis.

Several terms introduced into the literature on syphilis in recent years should be defined before discussing the therapy of this disease. It has been recognized that a positive reaction to the Wassermann test usually indicates the existence of syphilitic disease even though clinical manifestations are absent, i.e., a latent infection is present. The diagnosis of latent syphilis is made on a history of syphilitic infection, repeatedly positive serologic tests, normal findings on thorough physical examination, and a normal spinal fluid. Such a diagnosis is made with full knowledge that the disease may not be latent pathologically as many of these cases represent sub-clinical syphilis while others may be truly latent.

Another phase of syphilis only recently recognized is asymptomatic neurosyphilis; these patients have an abnormal spinal fluid but no clinical evidence of neurosyphilis. Among this group of cases, there seems to be a number having a more severe prognosis, recognizable by the laboratory findings and described as "pre-paretic" or said to have the "paretic formula." These terms indicate the belief that one can recognize in the spinal fluid early in the course of the disease those patients in whom late serious forms of neurosyphilis are likely to develop. Not all patients with positive spinal fluid findings will develop paresis or tabes any more than all patients with positive blood Wassermann tests will develop clinically serious forms of syphilis.

In recent years, it has become common to classify the manifestations of syphilis as early and late, reserving the former term to the first few months of the disease. This terminology is more satisfactory from the pathologic standpoint than the morphologic classification of primary, secondary and tertiary stages introduced by Ricord one hundred years ago.

### Incidence

One must waste no opportunity to remind the profession that syphilis is always with us. On routine application

of a serologic test to the students in the University of Minnesota Health Service, Diehl found an incidence of 0.2% positive reactors. This is a selected group from the intellectual standpoint and the figures indicate the incidence of syphilis before the age of graduation from college. In 1932, Olson reviewed the Wassermann record book for the in-patients of the University of Minnesota Hospitals and found an incidence of 5 to 12%. At the Swedish Hospital (private) in Minneapolis, an incidence of 1.5% was recorded in a series of 1,113 patients tested by Drake.

In spite of the obvious failure to report many cases of syphilis to the various public health officials, it is recorded more frequently than is scarlet fever or tuberculosis. Conservative estimates place the national incidence rate at 2 to 5%.

#### Clinical Course

There is perhaps no disease having greater variation in its clinical course. Osler rated syphilis high in the list of "killing diseases" but in certain cases of syphilis, even without treatment, the early lesions may be minimal and the individual lives a normal span of years with a complete absence of later symptoms. Evaluation of any type of anti-syphilitic therapy must be based on a knowledge of the clinical variations of the disease.

Perhaps, the most valuable observations on untreated syphilis were made by Bruusgaard who reviewed the patients on whom a diagnosis of early syphilis was made in Boeck's clinic from 1890-1910. These patients were given only oral therapy now known to have been practically without value (iron, quinine, etc.) and Bruusgaard obtained information as to their status from death certificates, autopsy records and clinical examination after periods varying from 3 to 40 years. The records of 473 of the original 2,181 patients were available for analysis. Bruusgaard found that cardio-vascular disease was the most common serious sequel to syphilitic infection as he recorded an incidence of 9% among those patients observed 10 to 40 years after infection. General paresis

or tabes was present in 4% of the 473 patients followed, but because of the care with which he examined records of hospitals for mental disease throughout Norway he believed the true incidence was closer to 1% of the entire group. Of those examined during life, 9% showed evidence of late benign disease (cutaneous, mucosal, osseous, etc.); 17% were asymptomatic but reacted positively to the Wassermann test, and 50% showed neither symptoms nor positive Wassermann reaction. These large groups of symptom-free patients might lead one to disregard the seriousness of syphilis, but one must recall that a mortality rate of 15% results in an enormous total when the disease is more common than scarlet fever or tuberculosis. Bruusgaard's study made no attempt to determine the importance of syphilis as an infectious disease, its effect on the live birth rate and the problem of the congenital syphilitic.

Another important study of untreated syphilis was carried out several years ago by a German-Russian expedition to Burjato-Mongolia where untreated syphilis has been present for 175 years. Beringer reported evidence to disprove theories that neurosyphilis appears only in civilized countries or as a result of treatment. Although the clinical course was frequently severe among these people, latent and neurosyphilis were not uncommon findings.

Another study which must be mentioned is that conducted in the past few years by the Cooperative Clinic Group representing five large syphilis clinics and the U. S. Public Health Service. It is an attempt to evaluate various methods of therapy and the results are compared with those recorded by Bruusgaard. The Cooperative Group point out that therapy results in a much lower incidence of demonstrable disease in the group observed 3 to 10 years after infection. Because of the relatively recent application of adequate anti-syphilitic therapy, there are few records of patients to be compared with the 10 to 40 year group of Bruusgaard, and the ultimate advantage of therapy could not be determined. As a result of this study, there was outlined the minimum amount of

treatment which is usually adequate in early syphilis. One must warn against the recent tendency of the profession to regard this as a standard outline of therapy.

### Neurosyphilis

It is only within the last 50 years that syphilologists have recognized any relationship between syphilis and paresis and tabes, and only in the last 20 years has the direct pathogenetic relationship been clearly understood. The concept of asymptomatic neurosyphilis is even more recent and depended on the development of serologic tests.

Clinical and experimental studies show that even in the chancre stage of syphilitic disease the nervous system is involved in 25% of the cases. There is an increasing rate of involvement from this point to a peak at the end of 18 months. Involvement of the nervous system during the first few months of the infection is usually not dignified with the diagnosis of asymptomatic neurosyphilis but the persistence of abnormal spinal fluid findings beyond this period serves to indicate that group of patients among whom late parenchymatous neurosyphilis may develop. It is the duty of the physician to recognize these cases by early lumbar puncture and to institute proper therapy in order to prevent serious results. The significance of asymptomatic neurosyphilis was pointed out by Moore and Hopkins who found a mortality rate of 5% and a disability rate of 15% in a group of 123 patients observed an average of seven years. Most observers believe that a few month's observation of these cases under chemotherapy will point out the serious cases (pre-paretic) to whom fever therapy must be given.

Many syphilologists of wide experience have stated that the development of serious parenchymatous neurosyphilis is not observed in patients with a previously known normal spinal fluid, although the meningo-vascular type of infection does occasionally develop in these patients. (This does not mean that a pathologic spinal fluid reversed to normal by appropriate treatment cannot again revert to a pathologic state.)

### Cure

The term "cure" as used in syphilis may mean one of several things. Serologic cure means the reversal to normal of pathologic findings in the blood and spinal fluid. Clinical cure means the absence of demonstrable lesions (other than scars) or symptoms. Prolonged periods of observations (several years) must have passed before serologic and clinical cure may be pronounced. Pathologic cure must include an absence of even microscopic findings on careful examination of all organs. Biologic cure means a return to normal conditions so that reinfection can take place. Obviously, the latter terms are seldom used by clinicians. In parenchymatous neurosyphilis, one seldom speaks of cure but rather of improvement or remission or arrest of progress of the disease.

### Treatment

The therapy of syphilis serves 2 purposes, (1) to prevent transmission of the disease to others, and (2) to "cure" the individual of present signs and symptoms and prevent later disability. The first purpose is undoubtedly the more important and the standard methods of treatment available to all at private or public expense are sufficiently efficacious to control this phase of the disease almost completely if all patients applied for treatment within a few weeks of infection and received several courses of injections of an arsphenamine and a heavy metal.

There would be little need for the development of fever therapy if all patients received "adequate" treatment in the early stages of the disease but most syphilologists have the impression that a small group of patients -- perhaps 2 to 4% -- will develop serious forms of neurosyphilis in spite of the best treatment not available. In reviewing the records of 500 patients with syphilis of the central nervous system, O'Leary and Rogin found that 15 had received "adequate" therapy. Nine of these individuals presented the asymptomatic form of disease at the time of observation.

One might expect of chemotherapy better results in reducing the incidence of parenchymatous neurosyphilis. Some syphilologists feel that the difficulty is due to a neurotropic strain of spirochete. There is supporting evidence but no real proof for this theory in clinical and experimental observations. Bruusgaard felt that the individual's defensive mechanism was of greatest importance in determining the course of syphilis and careful study of the neurologic background of parietic individuals supports his opinion. Bolton stated that 82% of a group of patients he examined would have suffered from some other form of dementia even if they had never been infected with syphilis. Brothers found a "predisposing constitutional defect" in 30% and a history of excessive alcoholic ingestion for years in 25% of individuals with neurosyphilis. (The action of alcohol in delaying or preventing the response of early cutaneous syphilis to chemotherapy has been known for many years.)

#### Chemotherapy

Modern syphilitic therapy dates to 1909. Previous to this date, mercury (by mouth, injection, or inunction) and iodides were usually administered. Ehrlich's work with the arsphenamine group led to the development of arsphenamine, neo-, silver- and sulpharsphenamine, each having some advantages and disadvantages. More recently attention has been called to the pentavalent arsenicals, acetarsone (spirocid, stovarsol) and tryparsamide. The former provides us with a drug of certain but limited value available for oral administration; the latter is of definite value in the treatment of neurosyphilis.

In the past 2 years, mapharsen, an arsenoxide preparation, and thioarsene have been given clinical trial and are demonstrating some advantages. Another recent development is the administration by "constant drip" infusion of massive doses of neo-arsphenamine to early cases of syphilitic infection; within a few days the chemical equivalent of 6 to 8 weeks course of neo-arsphenamine is given.

In spite of advancing knowledge in this

field, paresis and pre-paresis remain relatively resistant to chemotherapy although tryparsamide and perhaps acetarsone are of some value in their treatment.

#### Fever Therapy

Before 1890, Wagner von Juaregg had recorded the observation that many psychotic patients who suffered an intercurrent febrile disease later showed mental improvement. He began experimental production of fever in such patients, at first using vaccines, then injections of tuberculin, and finally in 1917 introduced the inoculation of parietic patients with malaria. Since then, many other methods of producing fever have been tested: inoculation with relapsing fever and rat-bite fever, injection of vaccines such as typhoid, intramuscular "shock" therapy with foreign proteins or with chemicals like sulphur, electrical methods such as diathermy and radio-frequency currents, application of radiant heat, as by hot water bottles or light cradles, and its retention by wrapping the patient in blankets and rubber sheets, and most recently by Simpson who places the patient in a Kettering cabinet with circulating moist hot air (the purpose of the moisture is to prevent loss of heat by evaporation or perspiration). In spite of these advances, it is certain that the ideal method has not yet been developed.

Inoculation and injection methods fail to produce a high fever of a duration comparable to that obtained with malaria. The electrical and mechanical measures all require constant observation of the patient by a trained worker and a considerable investment in equipment. Because they require several hours' application before fever of a therapeutic level is attained, only 1 or 2 patients may be treated daily. With fevers produced by physical measures, there is a considerable latent period; i. e., the fever increases for some time after the stimulus has been removed; because of this feature a temperature elevation incompatible with life may be accidentally produced.

Inoculation Malaria

The vast amount of clinical knowledge behind malarial therapy may be judged by the fact that in von Jauregg's clinic alone 2,000 patients were observed in the first 10 years of its application and 3,000 more in the next 6 years.

Most observers of fever therapy have felt that the results obtained with malaria were better than with vaccines or physical measures and explained the greater improvement as a response to specific stimulation of the body defense against infection as contrasted with a simple elevation of temperature by other methods. More recently, however, failures with these other methods have been regarded as due to their inability to produce and maintain sufficiently high temperatures. The importance of the duration of fever was recognized early by von Jauregg and his associates and led to a tendency to measure the dosage not by the number of chills but by the number of hours of fever above 102°. There has been a recent suggestion that in diseases treated by induction of fever the benefit obtained is proportional to the number of hours during which the high body temperature is maintained.

In the first years, good results were obtained with fever therapy in the treatment of general paresis. Within a few years, fever was tried on many other phases of syphilis and seemed to be of value in the treatment of the following conditions although there is a general tendency to attempt chemotherapy first and use fever as a last resort: tabes dorsalis, meningo-vascular syphilis, asymptomatic neurosyphilis (particularly the pre-paralytic type), latent infections having a persistently positive Wassermann test, interstitial keratitis and iritis, and those few cases of mucocutaneous syphilis which progress in spite of chemotherapy.

Fever Therapy in Early Syphilis

A few workers have experimented with fever therapy in early syphilis with rather unsatisfactory results. Malaria was first used by Vonkennel and Matuschka and

Rosner, who claimed beneficial results. Kyrle also used this treatment for a few years and his cases were later reviewed by Kerl who thought the 31% incidence of clinical and serological relapse was too high to justify further consideration of such treatment. Schamberg using hot baths, Stokes with vaccines and Osborne with diathermy did not obtain striking results. Epstein and Cohen recently reported a series of cases in which the "blanket method" was used.

Although the cutaneous lesions of early syphilis usually heal with fever therapy, serologic reversal is seldom obtained and ultimate clinical relapse or progression to visceral disease are common.

Indications

On the Dermatology Service at the University of Minnesota Hospitals, the following conditions serve as indications for the use of malarial therapy:

1. General Paresis -- if early, chemotherapy is usually given a short trial under careful clinical and serologic observation. If the patient is in the advanced stages of the disease, he is given an immediate course of fever. (This latter group of patients is usually treated by the Neurology Staff.)
2. Tabes, meningo-vascular and asymptomatic neurosyphilis. If these conditions have developed in spite of early chemotherapy in an amount usually considered adequate, the patient is immediately inoculated with malaria. If the patient has been untreated or given inadequate chemotherapy, bismuth, neo-arsphenamine and tryparsamide are used first. Clinical or serologic resistance to therapy are indications for induction of fever.
3. Interstitial keratitis is regarded as an indication for immediate inoculation.
4. Syphilitics having persistent or recurrent cutaneous or mucous membrane lesions in spite of regular metallic

therapy frequently respond well to a course of malaria. Very few such patients have been observed here.

5. Early syphilis or latent syphilis (with positive blood Wassermann tests but negative spinal fluid findings) are not considered in this clinic as indications for fever therapy. It has been shown that a group of Wassermann positive latent syphilitics observed for 10 years had a higher proportion of serologic reversal than a similar group given fever therapy.

6. In all cases where fever issued, it is supplemented by fairly intensive chemotherapy shortly afterward even if such treatment has previously been given.

It is to be hoped that the preference for malaria as the favored method of fever therapy will not be regarded as an indication of lack of interest in other methods of producing fever but merely as an indication of preference for this method of known value. Diathermy, typhoid vaccine and pyrifera have all been tried and the newer developments are being observed with interest.

The lack of emphasis on trypanamide therapy in this review is not a denial of its efficacy and economic advantages. It is used regularly in our clinic with good results in selected cases. Intraspinal therapy is not carried out by our staff but the patients are admitted on the Neurology Service. We have seldom recommended its use.

#### Technic

The material used for inoculation with malaria is usually whole blood from a patient undergoing malarial therapy. It need not be taken during a chill. Five to 10 cc. of blood are injected, intravenously, if possible, on 2 successive days. Blood from "ordinary" malaria patients is not favored because of the danger of inducing mixed infections. Therapeutic strains of malaria are almost constantly available in Minneapolis or St. Paul (in a 5-year period, we have twice obtained malarial blood from the Mayo Clinic). If more than a few seconds

must elapse between withdrawal of the blood and inoculation of the patient, the blood may be citrated or oxalated. Blood grouping is unnecessary because of the small volume of blood used, although some workers feel that compatibility shortens the incubation period. The temperature at which the blood is kept seems to be unimportant except where the blood is to be transported for 24 to 96 hours when it should be kept cold to prevent incubator action for contaminating organisms.

Attempts have been made to transport anopheles mosquitoes in screened containers as the agent of infection. A safer and more logical development is the removal of the salivary gland of the infected mosquito. This natural container can be easily transported for long distances and the infected material injected into the patient.

Intradermal or intramuscular injection may be used but result in a longer incubation period, which averages 5 to 8 days when the intravenous route is used. If the infection remains latent, it may be activated by injection of typhoid vaccine or adrenalin. Generalized ultraviolet radiation or roentgen radiation of the spleen are also recommended for this purpose. Reinoculation frequently precipitates a series of chills.

Most therapeutic strains were begun as a tertian infection but usually became "double tertian" and the course of therapeutic malaria is nearly a disease in itself. Each attack of fever is usually preceded by a chill. The frequency, severity and duration of the attacks varies considerably. We have observed oral temperatures, ranging from the extremes of 94.5 to 107° during the course of treatment. The fever may develop daily or on alternate days or the course may begin with one and terminate with the other. Although the patient is very uncomfortable during the attacks, he usually feels little distress in the intervening periods. Tabetic patients frequently suffer from exacerbation of their symptoms and patients suffering from marked mental deterioration may be-



come disoriented.

Dosage may be regulated in two ways, more commonly by limiting the number of chills. It is customary to allow 8 to 12 seizures. The course may also be modified by the careful use of small doses of quinine which can be used in weakened patients to postpone onsets of fever for 24 hours to 48 hours or to cut down too high elevations of temperature.

All patients with clinical or asymptomatic neurosyphilis are first referred to the Neurologic Staff for specific diagnosis, and the patient is also carefully examined before inoculation to rule out advanced pulmonary, cardiac, hepatic or renal disease.

The more common complications of malaria are anemia, nephritis and shock. These may be recognized early and damage prevented by determining hemoglobin content, red blood cell count, and blood urea nitrogen twice weekly and examining the urine and determining the blood pressure daily. The most serious complication is rupture of the spleen which is usually fatal since the only treatment is immediate splenectomy. Daily abdominal palpation will usually warn of sudden or massive enlargement of the spleen. Moore observed splenic rupture in two of 600 patients treated with malaria but von Jauregg did not meet with this complication in 5,000 cases.

Rarely, if ever, is difficulty met in attempting to stop the course of fever although a single additional chill often occurs after quinine therapy has been instituted. Small doses of quinine for a few days usually suffice to protect against relapse but continuous treatment for several weeks is prescribed as an added measure of safety.

The risk with malarial therapy is estimated at a mortality rate of 5 to 10% among inmates of state hospitals for the insane. The rate is much lower among patients observed here, only one patient having died on the Dermatology Service as a result of inoculation malaria in the last 5 years (empyema complicating pneumonia which followed the course of malaria). In syphilis clinics, the rate varies from

0.5 to 3.0% but is necessarily higher among the more advanced cases seen on the Neurologic Service or among those who have been committed as insane.

### Results

Taken as a group, parietic patients respond well to fever therapy. Individuals of advanced years are not only poor risks but do not respond well to any treatment. Other groups in whom little benefit can be expected are patients with marked mental deterioration, those with depressed rather than euphoric attitudes, and individuals in whom the mental changes have appeared early in the course of the disease rather than from 15 to 20 years after the date of infection. Meninger and Wile, among others, have emphasized the fact that the results obtained in the treatment of juvenile paresis are considerably less favorable than with paresis in acquired syphilis.

Without attempting to quote individual reports, one may state that one-third of the parietics treated with malaria develop remissions of many years, in one-third the response is less marked but sufficient to allow a return to work of some type and in one-third the course is unchanged or in a few cases hastened. One must remember that previous to the introduction of fever therapy general paresis was considered a fatal disease with an average life of only 3 to 4 years.

Although the results with tabes are less satisfactory than in paresis, there are many cases which show great benefit. In general, one cannot expect any change in the physical findings but must be satisfied with the arrest of progress and the relief of symptoms. Frequently, the pains of tabetic crises respond well to this treatment. Obviously, the less advanced the development of the tabes the more likely that the patient will obtain a beneficial result. Optic atrophy often progresses in spite of this treatment as it does after other forms of therapy.

Cases of meningo-vascular and diffuse

cerebrospinal syphilis which have failed to respond to chemotherapy usually respond well to fever. The psychoses or other mental changes associated with these conditions serve as indication for early inoculation and frequently obtain benefit.

In asymptomatic neurosyphilis, the results of fever therapy are most gratifying because the treatment may be regarded as prophylactic. Not all these patients will require fever therapy but if one depended on chemotherapy alone he would allow some patients to develop paresis or tabes. O'Leary states that good chemotherapy will return the spinal fluid to normal and prevent the development of symptoms in 85 to 90% of these cases. Moore believes that serologic reversal may be expected in 40 to 60% of these patients and in 60 to 90% there is clinical arrest when malarial therapy is used. As mentioned earlier, there is a sub-group of these patients regarded as preparetic and having a poor prognosis. O'Leary observed benefit in 75% of this group after malaria, with complete serologic reversal in 45%.

It is evident that fever therapy is of great advantage to patients with severe forms of neurosyphilis. In almost all cases, it should be combined with chemotherapy. The serologic and clinical results immediately after a course of fever therapy are frequently disappointing but during a period of 3 to 6 months further improvement takes place. As in the field of cancer, the ultimate results of fever therapy cannot be determined until many years have elapsed under careful observation.

#### Summary

1. In at least 50% of syphilitic individuals, asymptomatic invasion of the central nervous system takes place within a few months after infection.

2. In many instances, this involvement is arrested by the individual's defensive mechanism. In most of the remaining cases, adequate chemotherapy will result in clinical and serologic "cure."

3. There remain a few cases (1 - 4% of syphilitic individuals) who will develop late parenchymatous neurosyphilis in spite of chemotherapy. These individuals can be recognized early by spinal fluid examination.

4. Fever therapy gives its best results in this group of "pre-paretic" asymptomatic neurosyphilis and in selected cases of general paresis.

5. Fever therapy is also of great value in other forms of neurosyphilis, an interstitial keratitis and in the presence of muco-cutaneous relapses.

6. In the past, the most satisfactory method of inducing fever has been by malarial inoculation.

7. Other methods of inducing fever are now being observed with great interest but must still be regarded as in the experimental stage.

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#### IV. HIS REPLY

FOLLOWING IS MY HUMBLE, COMPILED REPLY  
TO YOUR RECENT LETTER

Your letter quite recently dated, at hand  
The message it bears me I quite understand.  
The benign institution that you represent,  
On collecting my bill iseagerly bent.

I've accepted your treatment, experienced  
the knife,  
Intended to lengthen an ailing man's life,  
I've eaten your rations and taken your pills,  
Expecting relief from my aches,  
pains and ills.

I've spent many months in your hospital  
ward,  
Vainly hoping for aid while my bill upward  
soared,  
Vainly waiting for help that I'd heard  
could be gained,  
From your Doctors of brilliance  
and Surgeons so famed.  
I do not condemn them, they tried to  
do right,  
They carved off some pieces 'twas causing  
my plight,  
But each effort seemed futile and time  
glided by,  
My plight still remained but my bill  
mounted high.

And as time flitted onward my income  
depleted,  
I compare at the present with a fighter  
defeated,  
I'd pay my bill quickly and gladly, I swear,  
Except for the penury range that's my fare.  
'Tis like pushing a loaded vehicle uphill,

Endeavoring our gaunt, empty entrails  
to fill,  
But I'll try and keep trying as long  
as I can,  
What more can this dear world expect of  
a man?

It's so easy for men with good incomes  
or wealth,  
To scorn individuals with poor income  
and health,  
But I've promised myself and pledged  
each fellowman,  
That I'll do just the best that ever I  
can.  
An' keep hoping that some day the  
sun will shine thru,  
And permit me to do what I'm longing to  
do,  
To pay all my bills and be square  
with the world,  
And to trek once again with my banner  
unfurled.

\*\*\*\*\*

True letter received March 8th in  
Credit Department from patient owing  
\$101.46

Contributed by R.M.A.

#### V. NAMELESS ORPHANS

7 specimens without name of patient,  
source of material, or tests desired  
are being held in the laboratories in the  
Lost and Found Department. All were  
deposited on the doorstep in the last  
week.

#### VI. MOVES

DR. JAY CONGER DAVIS  
Announces the Removal of His Offices  
to

905 Medical Arts Building  
Ninth Street and Nicollet Avenue  
Minneapolis, Minnesota

for Practice of Cardiology and Internal  
Medicine

Electrocardiography Phone Geneva 2564

VII. BOY and GIRL

Born to Drs. John and Carolyn Adams, a son, John Milton, Jr., weight 7 lbs. 6 oz., on Mar. 20th, at 8:47 A.M.

Born to Dr. and Mrs. A. Keller Doss, a daughter, Elizabeth Lea, weight 7 lbs. 1 oz., on Mar. 27th, at 8:46 P.M.

Heartiest Congratulations  
and Best Wishes!

VIII. INTEREST GROUPS

In addition to departmental seminars, ward rounds, general hospital staff meetings, meetings devoted to a review of the literature in special fields, clinico-pathological conferences, etc., the University of Minnesota encourages groups with special interests to present formal programs. It is interesting to note the variety of interests in our organization, and the enthusiasm with which the programs are prepared and the meetings attended. In some instances they are a part of a city or state-wide interest; in others, the group is limited to the campus proper. Most medical men complain that there are too many meetings. This is true of meetings of a certain sort and for men whose interests are not served by such gatherings.

The interest is not confined to the medical staff, but also includes the technicians, nurses, dietitians and social workers. (See program presented by our hospital group of technicians). Many recent graduates complain that there is not enough teaching in the hospitals where they take their internships. At Minnesota it would seem that this criticism was not valid providing the interns took advantage of the opportunities offered in such a variety of fields of interest. Strangely enough, there are many untapped sources of legitimate interest, notably in the field of investigation of teaching methods in medicine.

The following incomplete list of such recent gatherings is simply an indication of some of the activities provided for all who are interested:

Minnesota Society for Experimental  
Biology and Medicine

March 18th, 1936  
8:00 p.m.

|  |                                   |
|--|-----------------------------------|
| Precipitin test with bones and teeth.  | A. T. Henrici                     |
| Bacteriologic studies in Myasthenia Gravis.  | E.C. Rosenow<br>&<br>F.R. Heilman |
| Serologic studies of Streptococci isolated from patients with Myasthenia Gravis.                         | E.C. Rosenow<br>&<br>F.R. Heilman |
| Variation of Micrococcus Tetrigenus.   | H.A. Reimann                      |
| A study of diphtheritis toxin neutralizing power of placental globulin extracts.                         | J.S. Drage                        |
| The nitrogen distribution in the globulin of human placenta  | J.S. Drage,<br>W.M.<br>Sandstrom  |
| The growth retarding effect of neon light.   | Geo. O. Burr                      |
| The fate of parenterally administered crystalline urobilin; a urobilin tolerance test of liver function. | C.J. Watson                       |
| -----  |                                   |
| <u>Twin City Technician's Society</u>  |                                   |
| March 18th, 1936      7:30 P. M.   |                                   |
| Comparison of methods for qualitative determination of albumin in the urine.                             | G.E. Erskine                      |
| The Koch-McMeeken method for nonprotein nitrogen determination.  | G. Zschesche                      |
| The use of routine bacteriological media.  | G. Lundquist.                     |

The laboratory routine  
for preparation of blood  
for transfusion. G. Lundquist

Qualitative and quanti-  
tative urobilinogen  
determination. M. King

Some common technical  
errors in basal metabolic  
determinations. T. Smith

Electrocardiographic  
methods. T. Smith

Roentgenographic tech-  
nique. L. Dahl

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Interdepartmental Seminar for  
Medical Research

March 19th, 1936. 8:00 P.M.

Cause of death in  
bile peritonitis. M. H. Manson

Investigations on  
the circulation time  
of the blood in dogs  
by ionization methods. Charles Sheard,  
Mayo Clinic.

The structure of the  
red blood cell. F. H. Scott

New observations on the  
sphincter choledochus  
Oddi. E. A. Boyden

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The Minnesota Pathological Society

March 24th, 1936 8:00 P. M.

The early stages of  
glomerulonephritis. E. T. Bell

The etiology of  
appendicitis. W. F. Bowers

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Minnesota Branch of American  
Association for Cancer Research

March 25th, 1936. 8:00 P.M.

An Improvement in the  
Method of Presenting  
Cancer Statistics. Lewis G. Jacobs,  
Cancer  
Institute

Rhabdomyosarcoma of  
Testis A. J. Hertzog,  
Mayo Foundation  
Fellow in  
Pathology

Hemangiomas of Bone R. W. Koucky,  
Cancer Institute

Medulloblastoma of  
the Cerebellum with  
Metastases to the  
Vertebrae. A. A. Nelson,  
Teaching Fellow  
in Pathology.

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Minnesota Radiological Society

March 28th, 1936 2:00 P.M.

Demonstration of Device  
for Serial Examination H. Milton Berg,  
of the Duodenal Bulb. Bismarck, N.D.

Roentgen Findings  
in Monilia Infection Kano Ikeda,  
of the Lungs. St. Paul.

Radium Treatment of  
Postoperative Paroti- Robert Fricke,  
titis. Rochester.

Roentgenologic Find- R. W. Morse,  
ings in Chronic Minneapolis.  
Gastritis.

Roentgenologic John D. Camp,  
Changes in Non- Rochester.  
Tropical Sprue.

Congenital Solitary  
Kidney with Traumatic L. G. Ericksen,  
Rupture, Clinically Dubuque, Iowa.  
Diagnosed.

Roentgen Treatment of  
Carcinoma of the Ovary. L. Jacobs,  
Minneapolis.

Roentgen Diagnostic  
Quiz. Conducted by  
L. G. Rigler,  
Minneapolis.

Address: 8:00 P.M.  
The Radiological  
Treatment of Leukemia  
and Allied Disorders. Ernest A. Pohle,  
Madison, Wis.

IX. MOVIE

Title: Zealand, The Hidden  
Paradise

Released by: M-G-M

X. OUR GUEST NEXT WEEK

----- Gatewood, M. D.,  
Chicago.