

1380/380

# THE MISCELLANY

A MONTHLY JOURNAL

OF



THE TRICHINOPOLY DISTRICT MEDICAL ASSOCIATION, Regd.

(Branch of the Indian Medical Association)

JANUARY

1941

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Vol. VIII

No. 1

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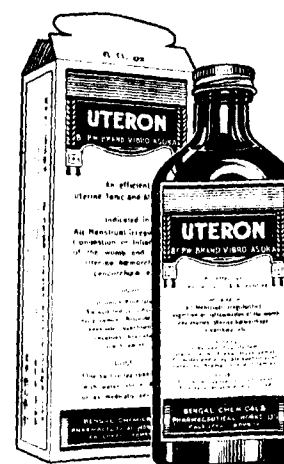
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OF THE  
TRICHINOPOLY DISTRICT MEDICAL ASSOCIATION  
(REGISTERED)  
FOR CIRCULATION AMONGST MEMBERS ONLY

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Vol. VIII]                      JANUARY 1941                      [No. 1

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## ✓ The Drama of Tuberculosis

JAMES ALEXANDER MILLER, M.D., NEW YORK

*Clinical Lecture at New York Session*

### The Human Drama

The effect of long drawn out chronic illness on life and character is well known to physicians and has appealed to historians, dramatists and story tellers in many lands, through various tongues and in numerous forms.

Many are the famous personages in various walks of life whose careers have been influenced by personal experience with tuberculosis. To enumerate only a few we may note:

In literature, Schiller, Keats, Byron, Thoreau, Bronte, Elizabeth Barret Browning, Robert Louis Stevenson and Eugene O'Neill.

In music, Chopin, Paganini, Mozart and von Weber.

In art, Raphael, Moliere and Rachel.

In philosophy, Voltaire, St. Francis of Assisi and John Calvin.

Among Statesmen, Cicero, Cecil Rhodes and Kerensky.

Among military leaders, Lord Nelson and John Paul Jones.

In science, Descartes, Priestly and Luther Burbank.

In medicine, Laennec, Ehrlich, Benjamin Rush and Trudeau.

Much has been written of the tuberculous temperament and many have accepted this suggestion as a definite fact with

wide implications. Such a specific influence on temperament is extremely doubtful. There can be little doubt that a long struggle with such a serious chronic disease had a profound influence on the character and career of those mentioned as well as of thousands of less favored folk. Success in overcoming such a physical handicap not only demands courage but it develops strength of character and increased confidence to meet the other problems of life.

Even in failure, fate may be conquered by the development of acquiescence and a philosophic calm which gives inspiration to all about one and thus enables the spirit to triumph not only over disease but over death itself.

Interpreted in this sense, tuberculosis has undoubtedly profoundly affected the lives and careers of many to their own betterment and to the great advantage of mankind.

The story of the lives of these and other great men and women is each a stirring drama with a universal appeal.

This has been widely recognized in many works of non-historical literature where art has served to dramatize more highly the human elements of struggle, of disappointment, of success or of tragedy. Of these none is more widely known and appreciated than Dumas's romantic play *La Dame aux Camélias*, or *Camille*, the story of which has also been dramatized in opera by Puccini in *La Bohème*.

The dramatic appeal of tuberculosis is recognized as a general one, directed to the imagination and sympathies of all but especially to physicians who through the long history of our profession have witnessed the patience, the courage, the tragedy of many grim struggles and often the eventual triumph.

The human side of our professional contacts has enriched our experience, has strengthened our faith in human nature and has developed our spiritual as well as material resources to help others combat this disease.

#### The Medical Drama

Fascinating as is the human story of this age-long disease, it is the story of the gradual development of our knowledge

of it that is of especial interest and concern to a gathering of physicians such as this. I therefore will address myself to a brief review of that history. This too is a drama of intense professional as well as human interest.

Such a historical review has the endorsement of Sir William Osler who once wrote: "By the historical method alone can many problems in medicine be approached profitably. For example, the student who dates his knowledge of tuberculosis from Koch may have a very correct but a very incomplete appreciation of the subject."

#### Early History

References to tuberculosis are recorded in Persia and Egypt as far back as 2000 B.C. but it is not until the time of Hippocrates, 450 B.C. that any important medical records are available. While Hippocrates made some very keen clinical observations, as in his clear picture of pneumothorax and his emphasis on the value of rest, of a milk diet and of climatic change in the treatment of pulmonary tuberculosis, his theory of its causation was the aspiration of mucus from the brain and conceived of its pathology as tumors of the lung with a tendency to suppurate.

Hippocratic medicine extended from Greece to Rome, where Galen, 150 A.D., was the dominating figure. His conception of the disease was that of ulceration rather than tumor formation and he thought that it was caused by the corrosive action of tissue fluids.

Galen's ideas prevailed for 1,600 years. They were preserved and practised in very crude forms almost exclusively in the monasteries during those long dark ages.

In the seventeenth century came the revival of learning, in which medicine shared. The advance of medical knowledge came primarily from postmortem examinations long proscribed by religious opposition and the first leaders were in Holland, notably Sylvius and Boerhaave, and in England, Willis. Thus was gross pathologic anatomy first established as the fundamental basis of scientific medicine.

In the eighteenth century the possibility of the communicability of tuberculosis was first recognized in Spain and later in Naples, where the first quarantine against the disease was established. In physical diagnosis the first great step was taken in 1761 by Auenbrugger, who introduced percussion as a valuable method in the physical examination of the chest.

In 1790 Baillie in London after careful anatomic studies expressed his belief that tuberculosis and scrofula were the same disease, a fact hitherto disbelieved.

#### The Nineteenth Century

The nineteenth century developed medical knowledge to an extent and at a tempo never before known. The earlier decades were dominated by France. Bayle in 1810 classified pulmonary tuberculosis so as to simplify greatly clinical thought and laid the foundation for the astounding contributions of Laennec, who in a few brief years co-ordinated the pathologic and clinical concepts of tuberculosis, crystallized them into one of the great medical classics, *Traite de l'auscultation mediate et des meladies des poumons et du coeur*, published in 1819, which stands to-day as a work unexcelled for accuracy and clarity of description. Incidentally he invented the stethoscope, for which feat he is perhaps most widely known and then he tragically died at the age of 45 from the very disease which he was the first to understand adequately and to describe.

Following Laennec, Louis carried on his great French tradition of careful physical examination of the chest and, in Vienna, Skoda added notable contributions in the 1830's.

In 1843 Sir James Clark in England reemphasized climatic treatment especially in the mild environment of Medeira and the Riviera.

It was at this time that pathologic histology first began to be studied because of the development of the microscope.

Virchow in Berlin led the way in these studies, and in 1847 he gave the first accurate histologic description of tuberculous lesions. Master as he was, he still clung to some of

the old erroneous theories for example that tubercle was caused by irritation and that tuberculosis and phthisis were distinct and separate entities. As late as 1866 one of Virchow's students, Niemeyer, uttered the famous dictum "The worst thing that can happen to a case of phthisis is to develop tuberculosis."

The centre of progress then shifted back again to France through the remarkable researches of Villemin from 1862 to 1867. The name of this brilliant investigator has been extraordinarily neglected in the history of tuberculosis. By clinical investigation supported by animal experimentation he strongly opposed the then accepted theory of a diathesis as the cause of the disease and came to the conclusion that it was due to an extraneous agent of a virus nature. He considered tuberculosis comparable to syphilis and glanders and that it was a zymotic disease which was communicable and he proved that this communicability was accentuated by overcrowding. As a result, he suggested measures of prevention by the improvement of environment and by protection from exposure to known sources of infection. Villemin was thus the logical forerunner of Robert Koch and the bacteriologic era.

#### The Bacteriologic Era

The revolutionary discoveries of Pasteur, begun in 1870 laid the foundations of bacteriology and led to the knowledge of the causation of tuberculosis as well as of many other infectious diseases. Thus was begun the astoundingly rapid development of modern medicine, i.e., within the lifetime of some of us here present. Pasteur himself did not investigate tuberculosis but it was inevitable that his ideas of bacterial infection should have immediately directed attention to tuberculosis because of the suggestive facts already established by the investigations and theories of Villemin. Laboratory studies were prosecuted feverishly under the exciting stimulus of the new knowledge but tuberculosis proved a more difficult problem than some other diseases and it was not until 1882 that Robert Koch announced his proved discovery of the tubercle bacillus as the cause of tuberculosis. It is interesting to note that within a few months of Koch's announcement Baumgarten

and a few months later Aufrecht published the fact that they too had recognized the germ of tuberculosis and there can be no doubt that these investigators discovered the tubercle bacillus coincidentally with and independently of Koch. Koch, however, has always been credited with the discovery because of the priority of his publication and also because his announcement was made in a paper which was a master-piece of scientific description and logical thought.

This paper, entitled *Die Aetiologie der Tuberculose* and published in the *Berliner klinische Wochenschrift* April 10, 1882, is another of the great classics of medical literature. It is to be noted that these discoveries were materially aided by the use of the staining qualities of the aniline dyes developed by the researches of Paul Ehrlich.

The cause being known, naturally thoughts and hopes turned to the discovery of a cure for tuberculosis and by none more energetically than by Koch himself. In 1890 he electrified the world by the discovery of tuberculin, his experiments leading him to the belief that in it might be a specific cure. The excitement was intense. Welch, who was then professor of pathology and bacteriology in New York sent his promising young assistant Hermann M. Biggs to Berlin and he brought back to America the first supply of "Koch's Lymph," as it was then called. Trudeau in his isolated make shift laboratory at Saranac Lake caught the spirit and began his lifelong clinical and animal experiments with tuberculin. All over the world scientists, physicians and laymen alike were in a highly excited state of eager expectancy that the cure for the greatest cause of disease and death was at hand. Slowly came the disillusionment, and it is a sobering reflection on the dangers of premature optimism that now, fifty years later, in spite of countless experiments and many collateral additions to our knowledge, a specific cure of tuberculosis still eludes us.

The discovery of tuberculin however had real value, for through it as well as by bacillus inoculations Koch developed our knowledge of the variation in tissue reactions between primary and secondary infections, the so-called Koch phenomenon; and particularly latter through its use as a diagnostic test, as developed in 1907 by Pirquet and Calmette.

Toward the end of the century the value of sanatorium treatment for tuberculosis, which was first instituted by Brehmer in 1853 and later by Dettweiler in 1874, became more generally recognized and the first sanatorium in the country was founded by Trudeau at Saranac Lake in 1884.

In 1895 Roentgen's discovery of the X-rays marked the beginnings of what was to become the invaluable diagnostic agents which they are to-day and in 1894 Forlamini's early clinical experimentation with artificial pneumothorax, which later revolutionized the treatment of many cases of pulmonary tuberculosis.

#### The Modern Era

We have thus seen that important beginnings in our present knowledge were made towards the end of the nineteenth century, but the extension of our knowledge and its practical application was rapidly and generally developed only after 1900 so that we may properly designate the last forty years since the turn of the century as the modern era. During this time progress in general medicine and especially in tuberculosis has been breath taking in its rapidity. The astounding details of this part of the story are, however, so well known that will be profitable to review only briefly the high lights of this period.

Von Behring had just postulated the concept that adult tuberculosis derived its origin from childhood infection and in 1912 Ranke built on this and the pathologic studies of Ghon. his philosophical treatise on the pathogenesis of the disease outlining three stages, the primary affect, the dissemination phase and lastly the localization in individual organs especially the lungs. This laid the basis for the modern concept of the endogenous origin of phthisis.

Early in the century Koch and Theobald Smith entered into their famous controversy concerning the distinctive variation between human and bovine bacilli, in which Smith proved his contention of their essential cultural and biologic differences. From these and other researches developed the program for the control of tuberculosis in cattle and the pasteurization of milk, the success of which has almost eliminated certain forms of tuberculosis in man, notably so-called surgical tuberculosis.

One of the notable achievements of this early twentieth century era was the organization of the antituberculosis campaign of education and prevention. In this country under the scientific and medical leadership of such men as Biggs, Welch, Trudeau, Osler, Flick and Knopf this campaign was crystallized into the National Tuberculosis Association, which organized a combined medical social and lay crusade which now has units in every community, with the far reaching effects with which we are all familiar.

One of the most important results was the emphasis placed on the institutional segregation of infectious cases, with the rapid increase of sanatorium and hospital beds to nearly 100,000 in the United States.

As an infectious disease tuberculosis became a chief concern of public health authorities, who, aided and encouraged by non-official agencies, developed the sanitary control regulations as we know them today. Biggs was the leader in this field in New York City and later in the state of New York. It was in 1893 that he first enforced compulsory registration of tuberculosis, against the strong opposition of the medical profession of that day.

Early diagnosis was soon discovered to be all important for successful treatment and from the multitude of overrefined methods have emerged the history of exposure and of suspicious symptoms together with the x-rays as the most important factors in early diagnosis, even superseding the value of physical signs.

In recent years mass examinations of groups of the population supposedly well have proved the great value of combined x-ray and tuberculin surveys for discovering early lesions especially in the young age groups.

Treatment of course was not neglected. The so-called hygienic dietetic regimen as best exemplified in sanatoriums has continued to be the fundamental basis of treatment, and here strict rest during the active stages with carefully regulated exercise during convalescence has proved to be a most important factor. Forced feeding and climate have become relatively less important.

The search for a specific cure has been relentlessly prosecuted both in the laboratory and in the clinical field. Serums and vaccines, special and often fantastic diets and chemotherapy applied by inhalations, by mouth and by intravenous routes have all failed, leaving behind a trail of disappointed hopes, of which the Fried man turtle serum fiasco is perhaps the most lamentable.

Calmett's BCG vaccine is a partial exception to the rule of failure, but even this has not yet proved to be of real value and at best is only a preventive and not a cure. In general it may be said that the recent success of chemotherapy in other fields has stimulated hopes for something similar in tuberculosis, but the time is not yet.

Chest surgery has advanced tremendously. Following on the general use of artificial pneumothorax, surgical methods to improve the results of the treatment of pulmonary tuberculosis have developed pneumolysis in the cutting of pleural adhesions, introduced by Jacobaeus in 1912 later phrenicectomy and especially thoracoplasty, first suggested by Brauer and Friedrich in 1909 and materially advanced to the position of a generally excepted procedure by the work of Sauerbruck and Wilms in 1913. At the present time about 40 per cent of all cases of pulmonary tuberculosis are being treated by some form of collapse therapy.

The combined action of all these measures of prevention and treatment, sanitary control, improvement of social and economic environment, education of the profession and the public, institutional segregation, earlier diagnosis and improved treatment has resulted in an astounding diminution in the incidence and the death rate from tuberculosis.

In 1900 the death rate from this disease in the United States was 202 per hundred thousand and in 1939 this had fallen to 47 or less than one-fourth of the 1900 figure, and even more strikingly in New York City, it has come down from 280 in 1900 to 50 in 1939, or less than one fifth of the previous total.

#### The Present Situation

The astonishing progress that has been made in the control of tuberculosis during the past forty years, as evidenced by the

statistics just cited, has led to a widespread impression that the fight has been won and that the extermination of the disease is in sight. While this would appear more nearly a possibility than ever before in history, is the part of wisdom that this be not taken for granted. Tuberculosis is still one of the major causes of death especially in the younger age groups, and while it no longer holds the center of the stage in the drama of disease it nevertheless still plays a most important role. With the still very numerous foci of infection which exist, it would appear that under certain conditions the disease might easily begin to increase again. Certainly this might be expected if the precautions and methods learned should be relaxed because of satisfied complacency. In the present world crisis, for example, one may properly be concerned over the effect of postwar conditions. The experience of the last world war taught us how easily under conditions of privation, strain and undernourishment the tuberculosis morbidity and death rate can raise rapidly. Also with all of our accumulated knowledge there is still much that we lack which lends certain elements of uncertainty to the situation. As we possess no specific treatment our methods must still be indirect with especial emphasis on prevention. This includes segregation of infectious cases, earlier diagnosis particularly through mass surveys and follow-up of contacts, with more adequate treatment of discovered cases before they become clinically active. The more widespread use of the x-rays is essential in this programme.

It is to be noted that all of these methods are directed against the infection against disease that it has already caused.

#### The Factor of Resistance

There is another aspect of the problem sensed but still imperfectly understood. This is the defence mechanism in the human body against the infection. That this is a very real factor is evidenced by the facts now known that when exposed many escape infection and that of those known to be infected only a little over 1 per cent actually develop clinical disease. The wherefore of this is not definitely known but there are some intimations concerning it. It is well known for example that unfavorable environment predisposes to tuberculosis, which has

long been recognized as a disease of the poor. Better opportunity for infection undoubtedly plays a role here, but that lowered resistance is also important seems evident. Natural or constitutional resistance is evidenced by the great variation in susceptibility in individuals, in families and in races. This applies to susceptibility to infection as well as to disease, as shown by the appreciable number of children who, though definitely exposed, fail to react to tuberculin. Natural or constitutional resistance is evidenced by the great variation in susceptibility to infection as well as to disease, as shown by the appreciable number of children who, though definitely exposed, fail to react to tuberculin. Natural resistance apparently can be enhanced through generations and possibly in some form it may be inherited.

Insufficient or unbalanced diets play their part. This has been attributed in the past to improper caloric food values, but the increase of knowledge concerning vitamins indicates that they may soon be recognized to be of at least as great importance. At present, however, we lack any precise knowledge of the particular vitamins which may influence resistance to chronic infections such as tuberculosis.

There is overwhelming evidence that a tuberculous infection successfully met changes the reaction of the body to subsequent infections and that this change means increased resistance. Such acquired resistance is only relative and may be overcome by large doses of infection or may be lowered by adverse environmental conditions. This resistance, acquired through many years or generations of exposures to repeated small infections, modifies the character of the disease and diminishes its prevalence.

What will be the epidemiologic consequences when an ever increasing proportion of uninfected persons as seen especially in rural areas are exposed to infection in later life under urban surroundings is still an open question. In other words, is it better to face the vicissitudes of life with a positive or a negative tuberculin reaction? Opinions differ, but the present trend in our campaign against exposure to disease is certainly tending to create a predominantly tuberculin negative population and at the same time the disease itself is diminish-

ing. Theoretically, however, one cannot help but share the apprehension expressed by Bushnell many but years ago that under certain favorable conditions this might conceivably lay the foundation for the return of tuberculosis as an acute epidemic disease. What is much needed is some criterion, not yet available, which might afford a basis for discrimination between good and bad risks under undue exposure to infection.

To those who believe in the great protective value of small doses of infection, a system of controlled vaccination appeals as the most satisfactory answer. Many animal and clinical experiments have been made in this field, of which Calmette's BCG is the outstanding example; but neither this preparation nor other experiments have as yet been proved to be of widespread usefulness.

The discussion of this problem has assumed considerable recent importance with regard to the hazards of tuberculosis to the medical and nursing professions, but practically it would appear that this danger has been greatly exaggerated. In the meantime for better or for worse we are rapidly increasing the proportion of "virgin soil" for tuberculosis among our general population.

#### Chemical Possibilities

In recent years there has been a shift of research activity from the immunologic field to that of chemistry. The biologic characteristics of the tubercle bacillus are quite different from those of the streptococcus and the pneumococcus and among them apparently is an increased resistance to the destructive or inhibitive action of chemical substances introduced into the living body. The challenge in the direction of chemotherapy has, however, a great appeal and hopes for the future are not without a reasonable basis.

This necessarily cursory review of the story of tuberculosis reveals grounds for great satisfaction. Made possible by scientific research, guided by medical skill and strengthened by the social and economic forces released by a widespread diffusion of knowledge to the public, the struggle to overcome the "Great White Plague" has attained notable successes.

As already indicated, there still remains much to be done. What part is to be played by the medical profession in what we hope may be the concluding acts of the drama?

#### Present Medical Responsibilities

*Earlier Diagnosis:*—X-Ray examination is the corner-stone. The cases of pulmonary disease which may be considered really early can be discovered only by this means. When definite physical signs are present, the disease is usually already advanced. The history of suggestive symptoms is the indication for a prompt x-ray examination. Surveys by combined x-ray and tuberculin examinations for groups of apparently healthy people should have the active support and co-operation of physicians, but as individuals their chief responsibility is to concentrate especial attention in the most likely direction; this means on certain races, on certain economic groups and, for all classes, on the contacts with known cases.

*The Better Practice of Preventive Medicine:*—This includes not only the activities just enumerated but also a consistent effort to build up general health so that any later infection can be the better resisted. In this age of preventive medicine it is to be feared that many physicians still neglect its practice in favour of attention to the more insistent demands and the greater medical interest of frank cases of disease.

*Co-operation with Public Health Authorities:*—These authorities have the direct responsibility for the control of infectious diseases. They must work largely through physicians. If we as physicians assumed a greater individual responsibility to act as self-constituted health officers for those patients under our care, the combined effect of private and public effort might well be irresistible.

*Provision for Prompt and Adequate Treatment:*—Strict bed rest is the most essential factor in the treatment of cases of active disease. In the really early cases the results are prompt and remarkable. Bed rest is applicable not only to cases in which there is fever but also to many a febrile cases in which other manifestations of activity are present. Change of climate, so long advocated, is definitely subordinate in importance to

rest and in many active cases the journey involved in changing climate is absolutely contraindicated. Later, during the convalescent stage, a change to a more favourable climatic environment, especially for city cases, is of real value but should always be combined with proper medical supervision.

The proper regimen of a rest cure is always difficult in the home and often is impossible. Unless the home conditions can be made right or if the physician in charge is not experienced and interested in the numerous small but essential details involved, institutional care in hospital or sanatorium is necessary. Moreover, the educational and training value of the sanatorium regimen is very great not only at the time but also later when the patient goes out to face the problems of the return to normal life.

The various forms of collapse therapy have great value in properly selected cases. That so large a proportion of all cases, about 40 per cent, are now treated by these methods is, however, a reflection on the efficacy of our early diagnosis and treatment for these cases are already advanced in the disease. Nevertheless, collapse therapy saves many lives otherwise doomed and while it still presents many difficulties and problems, it represents the greatest major advance in the treatment of pulmonary tuberculosis of our generation. Incidentally it has revived a surgical interest in tuberculosis which is valuable for the proper understanding and treatment of the nonpulmonary forms of the disease as well.

The vital importance of time must be emphasized in all forms of treatment as well as in diagnosis. In the latter the interval should be short between incidence and diagnosis; in the former it should be long, far longer than is frequently appreciated. Many an apparent cure has been ruined by a premature return to normal life.

All patients, however, well they may appear, require a careful follow-up with periodic medical supervision for several years, which is essential if disappointing relapses are to be avoided.

While we as physicians are carrying out these generally accepted principles of treatment we should be receptive to the possibilities of a better and more specific form of treatment. Cautiousness in accepting any such cures is warranted by numerous bitter experiences and by our realization of the peculiar difficulties of the problem; nevertheless, both the hope and the possibility exist and when they are realized the wise physician will be the most eager to give the method a fair trial and also be the best judge of its efficacy.

Thus I bring to a conclusion this brief survey of our progress in the knowledge and measurable conquest of tuberculosis.

To physicians the story may well bring satisfaction in the achievements of the past but it also presents a challenge for the future. Scientists have pointed and will continue to point the way. Sanitarians and sociologists will largely apply the principles established. But on physicians has always rested the responsibility for meeting the actual problems at first hand and it is on their skill in diagnosis and treatment that continued success largely depends. It is my hope that the history of the way that we have come will throw some sidelights on our present knowledge and also point the way for future progress.

The problem of chronic illness may not be as dramatic as the sudden crisis of acute disease, but from their very duration they more profoundly affect individual, family and community welfare.

Tuberculosis is still one of the most prevalent and important diseases. The physician who finds it worth his while to study it carefully will realize that, while there is still much that is not known, his effort to acquire and apply present knowledge will find him closely in touch with many other diseases and he will be led to study not only the lungs but also practically every organ of the body. He will meet personal and family problems which demand a human and psychologic approach. He will be brought to a realization of the importance of social and environmental conditions, the study of which will greatly broaden his horizon. Lastly he will appreciate that tuberculosis is a community problem which

in importance even outweighs the interests of the individual and of the family.

Thus tuberculosis demands much of the physician. It is a challenge to our best effort. The degree to which we meet this challenge is a measure of our achievement as physicians and as citizens and will determine our ability to continue to play the leading role in this great drama.

*Ref. Jour. A. M. A., Vol. 115, No. 15.*

By injecting what he calls "intra-sauces" into the hearts of chickens and ducks, a French scientist provides a natural spicy flavour to the meat. The sauce circulates in the blood stream.

It would be good if the experiment is carried further and made to work with vegetables also.

\* \* \* \* \*

Phone : 86018.

Estd. 1894

OLD GENUINE REMEDY

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AVAILABLE AT ALL CHEMISTS.

## Solution of Posterior Pituitary in the First and Second Stages of Labour

BY

JOHN A. SHARKEY, M.D., Philadelphia.

Solution of posterior pituitary includes pituitrin, pitocin, infundin, thymophysin, pitanthym and all other preparations depending for their action on the oxytocic principle of the posterior portion of the pituitary gland.

### Normal Labour

The physician administers it to accentuate pains and hasten delivery with, as Mendenhall remarks, "unfortunately more benefit to himself than to the mother and baby."

Spontaneous labour often causes intracranial hemorrhage in the baby, resulting in stillbirths and neonatal deaths. In the Holland and Lane-Clayton report 520 spontaneous deliveries, eighty-seven babies had tentorial tears, forty of which occurred in 299 normal vertex presentations. If this is true of spontaneous delivery in which solution of posterior pituitary is not used, how much more must it be true when the uterus is made to contract violently. These violent contractions may occur with even small doses, for when labour starts the uterine muscle is peculiarly sensitive to the action of this drug. When a baby is driven through the birth canal so rapidly that it has no chance to accommodate itself to the various diameters of the pelvis, tears of the falx cerebri and tentorium cerebelli are bound to occur. Again, tetanic contractions of the uterus interfere with placental circulation and with the blood supply of the uterus, resulting in fetal asphyxia and damaging uterine musculature. There is also the danger of deep cervical and perineal lacerations, injuries to the birth canal, premature separation of the placenta, postpartum hemorrhage, shock and collapse, and finally rupture of the uterus.

However often it has been emphasized that solution of posterior pituitary should not be used in normal labour, there remains the impression that it is in this condition it is used most widely and the reports of maternal health committees and government agencies confirm this.

### Uterine Inertia

Uterine inertia is a term used to describe weakness and irregularity or infrequency of uterine contractions during labour. It may be due to mechanical causes or to some deficiency in the uteromusculonervous mechanism, the so-called true primary inertia. It is usually classified as primary and secondary.

The use of solution of posterior pituitary should be limited to cases of true primary inertia. These are the cases in which there seems to be actual weakness of the contractile muscle or of the uteromusculonervous mechanism, though the real cause of the difficulty is still unknown. It is likely to occur in elderly primiparas of the nervous emotional type, in elderly multiparas with long intervals between pregnancies, in women whose obesity arises from endocrine dysfunction, in anaemic or asthenic women, in chronic invalids, in convalescents from acute infections and in those undernourished from hyperemesis gravidarum. Those women represent a small group as a whole and not all of them will exhibit uterine inertia.

Solution of posterior pituitary should not be used when uterine inertia is due to the following mechanical causes.

- (a) Generally contracted pelvis.
- (b) Abnormal positions of the fetus, as persistent occiput, posterior, breech, shoulder, face or deep transverse arrest of the vertex.
- (c) Tumors of the uterine wall or other tumours in or near the uterus blocking the birth canal.
- (d) Congenital anomalies such as bicornate uterus or infantile uterus.
- (e) Abnormal positions of the uterus, as retroflexion or antelexion with pendulous abdomen.

(f) Great multiparity causing thinning of the uterine wall with the danger of spontaneous rupture of the uterus.

(g) Overdistention of the uterus, as in polyhydramnios, and multiple pregnancies.

(h) Scars in the uterus from previous operations or disease of the uterine wall.

(i) Dystocia dystrophia syndrome.

(j) Rigid cervix, undilatable.

A critical examination of the list of causes just given will show that operative intervention will often be necessary to accomplish delivery and that in the treatment of uterine inertia the underlying condition is the important factor.

*Secondary Inertia:*—In my opinion, solution of posterior pituitary should not be used in secondary uterine inertia when the uterine muscle is exhausted after many hours of hard labour. Sedatives, rest and maintenance of nutrition to prepare the patient for operative delivery or a further test of labour is advisable. Certainly solution of posterior pituitary has no place in the treatment of Bandl's contraction ring, strictura uteri and tetanus uteri.

When the second stage of labour is unduly prolonged because of the failure of weak uterine contractions to expel the fetus, presentation being normal and rotation completed, it is perhaps wise to terminate labour with low forceps. I realize, however, that in home deliveries, because of lack of facilities, it is not always possible in cases of mild inertia to do outlet forceps operations. Under these conditions solution of posterior pituitary may be used in lieu of forceps, preferably in multiparas, and in doses of 1 or 2 minims (0.06 or 0.12 cc). In fact this is the only instance in which the American Committee on Maternal Welfare recommends the use of solution of posterior pituitary in the first two stages of labour.

### Complications of Pregnancy

1. *Toxemias of Pregnancy.*—In toxemic patients, solution of posterior pituitary should not be used because of its potential dangers. It has been shown that the blood pressure may

rise an average of 51 mm. of mercury after the misdirected use of the drug in toxemias and that it may reduce diuresis and cause convulsions or pulmonary edema if the patient is edematous.

2. *Abruptio Placentae*.—Solution of posterior pituitary in conjunction with the abdominal binder has been recommended in the treatment of abruptio placentae. This treatment should be administered only by a skilled obstetrician with sound judgment.

3. *Placenta Praevia*.—If intrapartum hemorrhage is due to low implantation of the placenta, solution of posterior pituitary will not control the bleeding and the drug should not be given for this purpose.

4. *Heart Disease*.—Solution of posterior pituitary should not be used in serious heart disease because of the danger of reactions and the added strain placed on the heart should the labour become severe following the injection of the drug.

#### Dosage

The dose of solution of posterior pituitary should always be small and should not exceed 3 minims (0.18 c.c.). If one prescribes unit doses, the standard preparations are marketed with 10 international units per cubic centimeter or two-thirds unit per minim.

The drug should be stopped when uterine contractions start. Too violent or long continued contractions must be controlled by the administration of an anesthetic. If the tetanic contractions cause fetal distress and delivery is imminent, labour should be terminated by forceps.

Ref: *Journ. A. M. A.* Vol. 115 No. 16.

A rat does at least ten rupees' worth damage in a year. It is estimated that there are twice as many rats as people in the world.

## The use of Solution of Posterior Pituitary in Modern Obstetrics

JOSEPH B. DE LEE, M.D., Chicago

We, medical men, must admit that sometimes as practitioners, let us say from over-enthusiasm or because we believe propaganda, we have been at fault in our application of the blessings of science—anesthesia, asepsis, surgical technic, hospitalization and medication.

Among these indictments, solution of posterior pituitary has been singled out for this symposium. Rupture of the uterus, laceration of the cervix and dead babies follow in the train of its use, all too often, yet, it is being used more widely than ever.

Many preparations of solution of posterior pituitary are on the market and although they are supposed to be standardized in Vogtlin units they vary not a little in strength and, what is equally important, some of them contain an appreciable amount of protein, which may cause anaphylaxis.

Further, combinations of solution of posterior pituitary with hormones and or drugs—proprietary under fantastic names—have enjoyed worldwide recommendation and use. Manufacturers have been quick to realize the lusciousness of a world market with more than 40,000,000 births annually although many in the far countries are beyond the influence of seductive advertising.

It is claimed that these preparations are safer than straight solution of posterior pituitary, that they have virtues of their own which not only reduce the dangers of the oxytocic but also favourably influence labour; and obstetricians are importuned to administer these questionable drugs to all women for the purpose of hurrying delivery.

No convincing physiologic experimental or clinical evidence has yet been presented to prove that thymophysin, pituthymin, thyuitary and the like are any-thing more than diluted solution of posterior pituitary or the drug in another guise.

It is significant that only one of these proprietaries has been submitted to the Council on Pharmacy and Chemistry of the American Medical Association and that one was refused approval, its claims not having been substantiated.

Pharmaceutic firms advertise solution of posterior pituitary as an oxytocic for special indications but doctors the world over are using it so indiscriminately and the evils of such practice have become so notorious that it is time for the profession to take stock and see where it is going.

There is an increasing demand among American women for "streamlined labour," an unhealthy demand fostered by hysterical magazine and newspaper writers and, I regret to have to say, by not a small number of their results, experienced many abnormally rapid labours, and learned that a streamlined labour can be as safe as a streamlined parachute.

What are the dangers resulting from injection of solution of posterior pituitary?

One thinks they all would come from the increase in the violence of the uterine contractions. Most of them do, but solution of posterior pituitary has other evil qualities. It can cause shock which, though seldom fatal is often ominous and may leave permanent after-effects in the brain. Shock acts like asphyxia. Solution of posterior pituitary upsets the hormone balance in the body. Therefore its use should be avoided in cases of dysthyroidism and diabetes, ergonovine being used instead. In patients with heart disease it may be used only post partum, but here too ergot is better. In cases of threatened eclampsia, it is claimed, though I have not yet seen it, to cause convulsions. Indeed Schockaert reports postpartum eclampsia without premonitory symptoms with the use of solution of posterior pituitary. Here the pure oxytocic principle of the gland is recommended, and the reason given are that the whole extract, containing the pressor factor, reduces the flow of urine, raises the blood pressure and also directly causes fits. The latest experiments (Bradbury) cause surprise by showing that the pressor factor affects the uterus and is oxytocic like the true oxytocic factor—which leaves us about where we were before.

Perhaps we shall learn that solution of posterior pituitary causes other acute dyshormonisms, which may explain death in labour, the convulsions and anaphylaxis.

But the greatest dangers come out of the increase in the intensity and duration of the contractions of the uterus. These may reach a violence that will rupture the organ if the resistance to the advance of the projectile (the baby) is more than the strength of the wall of the exploding chamber (the uterus). How many cases of pituitary ruptures of the uterus occur, will never be known. Either they are not reported at all or the examinations—under another diagnosis. Many women should have the words solution of posterior pituitary put in their death certificates instead of postpartum hemorrhage, embolism, massive collapse of the lungs, anesthesia or shock.

I have seen the pituitary blast the head through the cervix and the perineum, tearing both extensively.

It has been claimed that combination of solution of posterior pituitary can be formed which contract the fundus while they relax the lower uterine segment and cervix but I could not find in this claim an iota of scientific proof.

Solution of posterior pituitary can cause such violent labour pains, combined with powerful bearing down efforts, that the sudden overexertion causes cardiac death.

Uteri stimulated by solution of posterior pituitary not seldom suffer secondary atony with clot retention, thrombosis and embolism.

It is known that during a normal labour pain the baby is exposed to augmented pressure from all sides; its gross blood pressure is raised and also there are in its body local fluctuations of pressure which, as the cervix opens, are progressively greater in the direction of the vagina. This is because the resistance at the uterine outlet is diminished, and it is thus that the child is propelled into the external world. The baby's head naturally receives the brunt of the fluctuations in pressure, as is so plainly evident from the caput succedaneum and the minute hemorrhages in the scalp, the periosteum and often in

the subjacent dura and brain. The physics of the process can be seen and understood every time one squeezes a tube of tooth paste.

The molding of the head is another result of the mechanical forces of the uterus, and its safety for the fetus is only partly guaranteed by the slowness of its execution. Every strongly molded fetal head should be scrutinized at postmortem examination. One will be astonished at the dislocation and deformation of the bones, the distortion of the brain, the overstretched falx and tentorium, with even tiny dehiscences in them, and the minute and larger suggillations.

In this connection a recommendation of Dr. Rawlins of London 150 years ago is of interest. He forbade bearing down in the second stage of labour, insisting that the baby be born by the uterine action alone. He claimed that there was less perineal lacerations and fewer dead babies with this practice. A modern delivery room without "Bear down! Bear down!! Bear down!!!" would be quite a curiosity.

The harmful action of solution of posterior pituitary in normal labour is thus clear. Solution of posterior pituitary (1) strengthens the uterine power and prolongs its action, (2) shortens the distolic rest periods and (3) increases the intra-uterine tension by raising the tonus of the muscle—in short, solution of posterior pituitary makes normal pains pathologic and exaggerates all their evil effects on both mother and baby.

However, solution of posterior pituitary is one of the great blessings that science has conferred on women, and the profession is now well agreed on its scientific indications.

#### Scientific Indications

*During Pregnancy.* Solution of posterior pituitary could cause the relaxed ureter to expel its contents and thus aid in the cure of pyelitis. I have used it only after delivery but Hofbauer claims that it is safe during early pregnancy because the uterus has not yet become sensitized.

In case of abortion in progress, after an appendix operation, solution of posterior pituitary may be exhibited for the double purpose of emptying the uterus and overcoming ileus.

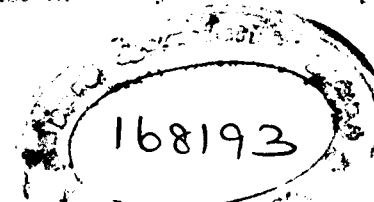
Solution of posterior pituitary is also useable in all abortions actually in progress to hasten the process and save blood. Further, when curetage is done for incomplete abortion one half ampoule, injected deep into the cervical wall, will stiffen the uterus, separate the secundines and give the curet a harder and safer surface to work on; it will also reduce the loss of blood. The blood should always be saved.

*Labour:*—It is safe to induce labour with solution of posterior pituitary but only if proper precautions are observed. It is never to be used in cases of placenta praevia. Therefore to induce labour I give one half unit with a tuberculin syringe and, with ether can in hand, watch the effect. At the end of twenty minutes 1 unit is given, and thereafter a like dose every twenty to thirty minutes until some effect is seen. Then I wait a while and if the force of the contractions dies off I repeat the dosage or increase it a little, not using more than one ampoule, 10 Vogtlin units, in one trial. I have discontinued the use of quinine to sensitize the uterus because it is inefficient and occasionally harmful. The morning of the induction, the patient is given castor oil.

During Labour itself. As has been sufficiently emphasized and proved, there is no justification for the use of any oxytocic in normal labour. Expediency and convenience of the doctor or patient are not scientific indications and, outside of running the risk of being legally held responsible in the event of accidents, the medical conscience forbids such use.

In cases of atonia uteri, pure primary uterine inertia in the absence of a contracted pelvis, fibroids or mechanical organic obstruction, I make a brief trial of solution of posterior pituitary watching and feeling my way carefully, like handling dynamite. These precautions are especially necessary after the membranes have ruptured.

For atony during the second stage of labour, even greater caution is necessary although it is here that the practitioner often uses the least. I feel sure that the forceps operation with episiotomy is safer to terminate labour, after complete dilatation with the head on the perineum, than giving a woman a shot in the arm to blast the baby out of her person. Every man



who practices obstetrics ought to know how to do an episiotomy and the prophylactic forceps operation. The baby's brain will suffer less damage and the mother's pelvic organ supports will likewise be safer.

*The Third Stage of Labour*—Should solution of posterior pituitary be used as a routine in the third stage of labour? Such practice is widespread but the reports of the results are conflicting. Some state that it shortens the third stage, reduces loss of blood, favours the expulsion of the placenta, prevents postpartum hemorrhage and favours involution, which minimizes the risks of infection. Others deny these actions. I have had not a few placental incarcerations which wiped out much of the pleasure of the other two advantages.

For many years, in all operative deliveries under a general anesthetic, we gave an ampoule of solution of general posterior pituitary immediately after the child was born and we recommended the procedure. In spontaneous deliveries in which the uterus acted well we did not use the drug as a routine but gave it when the patient had much obstetric analgesia and had or anesthesia. With local anesthesia it was not needed.

For postpartum hemorrhage solution of posterior pituitary is invaluable, though it fails occasionally. Of course it will not stop bleeding from a laceration or from a ruptured uterus (which incidentally it may have caused) but it will almost always cause a uterus to contract powerfully, especially if administered intravenously or injected directly into the uterine muscle. I always use ergonovine to back up the action of solution of posterior pituitary. Sometimes it is better than solution of posterior pituitary, particularly if put into a vein.

*In the Puerperium*—Solution of posterior pituitary has yielded place to ergonovine in nearly all cases in which an oxytocic is needed during the puerperium. I can imagine that it might be used to expel a piece of placenta or a clot that remains in the uterus or in late hemorrhages of a hormone nature, together with ergonovine.

Ref: J. A. M. A., Vol. 115: No. 16.

## Acetylsalicylic Acid Deaths

The only country in the world that permitted a patent for acetylsalicylic acid (aspirin) was the United States. The "Bayer" patent expired in 1917; since then the supply of acetylsalicylic acid or aspirin on the American Market has been essentially of the same quality, irrespective of the manufacturer. Even after the expiration of the patent in 1917 it has paid the Bayer Company to continue the proprietary advantages gained thereby, and the concern has extolled, through advertisements and the radio, the virtues of acetylsalicylic acid for the self treatment of many disorders. Other firms have done the same. Probably no other drug, as widely used, has had fewer deaths reported following its use. Fortunately, most persons who take acetylsalicylic acid, in common with other salicyl compounds, experience a warning sign (tinnitus) if overdosage is imminent, so that the drug may be discontinued before these persons become seriously poisoned. In spite of the tremendous amount of self medication with aspirin in this country comparatively little poisoning has been reported. No doubt, much harm indirectly has probably followed its indiscriminate use, in that conditions for which it was used were not remedied.

Since introduction of aspirin forty-one years ago by Dreser, many reports have appeared on the adverse effects which may follow its unwise use. These have included depression of the heart, habit formation, miscarriage in pregnancy, and idiosyncrasy causing such alarming symptoms as urticaria, pruritus, erythema and generalized angioneurotic edema. Cutaneous eruptions of various forms are not unknown, and even ulceration and gangrene have been attributed to its use. Because of the irritant action of the products containing the salicyl group on renal epithelium, acetylsalicylic acid is contraindicated in nephritis. Other persons especially susceptible to undesirable effects of the drug are drunkards and persons with diabetes. In the latter groups, adverse effects show a special relation to the nervous system.

Another member of the salicylic acid family which does not have altogether the same side reactions is methyl salicylate, well known commercially as oil of wintergreen. Approximately two years ago THE JOURNAL published an article on methyl salicylate poisoning in which Baxter, Hartwell and Reck reported two deaths in children following the accidental swallowing of oil of wintergreen. The authors also referred to an article in the *Archives of Pediatrics* wherein twenty-eight cases of methyl salicylate poisoning were reviewed by Lawson and Kaiser, who added another case of death following the use of methyl salicylate as a counter-irritant. In the twenty-eight cases reported by Lawson and Kaiser there were ten recoveries and eighteen deaths. It is also interesting to note that, in the report of the Registrar General in Great Britain on poisoning, methyl salicylate was shown to be responsible for three deaths in 1938, four in 1937 and four in 1936. Because of two recent deaths of children in Canada the Canadian Council of Health is considering classifying methyl salicylate as a poison. The mortality among the children has been as high as 60 per cent, even though only a small quantity has been taken. Evidently much more attention should be given to the toxicity of these rather common products which are used both in the home and in the practice of medicine.

(From the Journ. A. M. A., Vol. 115., No. 11).

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Last year, the Soviet Government had appropriated Rs. 40,000,000 to the development of healing by diet. Diet for patients suffering from a large variety of diseases are being worked out. Soviet Scientists claim dieting has been effective in curing seventy per cent of cases of gastric ulcers and gastritis and eighty per cent of liver trouble.

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## The Chemical and Mechanical Prevention of Syphilis and Gonorrhea

After carefully reviewing the available scientific data as to the efficiency of various means of chemical and mechanical prophylaxis the committee of the Hygiene Association and the United States Public Health Service makes the following specific recommendations:

1. Safest Method.
  - (a) Use a condom of standard type.
  - (b) Thoroughly wash the genitals and adjacent parts with soap and water as soon as possible (the sooner the better, but within one hour at most) after removal of the condom.
2. In the absence of a condom.
  - (a) Thoroughly wash with soap and hot water as already described.
  - (b) After urination, inject 6 c.c. of 2 per cent strong protein silver solution, or other efficient, nonirritating germicidal solution into the urethra and hold for five minutes.
  - (c) Rub 33 per cent ointment of mild mercurous chloride (calomel ointment) into the genitals and adjacent parts.

### Comment

The habit of cleanliness materially reduces the risk of infection. For the proper application of 2B and C, skilled attention and use of a syringe are necessary. Prophylactic treatment of this type can be given by physicians, by some clinics, and in prophylactic stations where they exist.

The Committee emphasizes the fact that the foregoing suggested preventive measures are not 100 per cent successful. Their efficacy depends first on the reliability of the materials used. A defective condom does not give the same degree of

protection as a sound article. The strong protein silver solution or the mild mercurous chloride may not be of the proper strength or may be inactive. Second, washing and application of chemicals may be delayed too long after exposure. Drunkenness may prevent correct application of any of these methods. It may be stated, however, that when these methods are followed correctly they will in the majority of instances prevent infection with syphilis or gonorrhea.

The medical profession and public health agencies, both official and voluntary, bear a heavy responsibility in the matter of the prevention of syphilis and gonorrhea by chemical and mechanical means. Since these methods are efficacious they would, if widely understood and correctly utilized by those who expose themselves to the danger of infection, result in a great diminution of syphilis and gonorrhea and would thereby greatly reduce personal, family and community disasters and the economic losses that result from these infections.

It seems clear, therefore, that health education with regard to syphilis and gonorrhea should include simple frank and explicit directions as to chemical and mechanical prophylaxis. This information should be included in its proper setting and in appropriate language.

It seems apparent also that, in addition to instructing the public regarding this preventive medical method, civilian, military and naval, medical and health authorities have the obligation to provide the facilities through which chemical and mechanical prophylaxis may be made available when and where needed. The authorities also have the responsibility for preventing the commission of fraud through the sale of worthless products to the public for the prevention of these diseases.

Finally the Committee is impressed with the fact that there are many unsolved and administrative problems within the scope of chemical and mechanical prophylaxis and the provision of adequate facilities for these procedures. It is considered that research in this field should be continued.

(Ref: J. A. M. A. Vol. 115, No. 14.)

## The Trichinopoly District Medical Association

(Branch of the Indian Medical Assocn.)

TEPPAKULAM, TRICHINOPOLY.

Proceedings of the monthly meeting held on 24-1-1941.

A monthly meeting of the above Association was held at 5-30 p.m. on Friday the 24th Jan. 1941, in the premises of the Trichy X-Rays Ltd., West Boulevard Road, Trichinopoly. Dr. P. A. S. Raghavan, the Managing Director of the Trichy X-Rays Ltd., and Secretary of the Association was 'At Home.' About 75 members were present. Major General N. M. Wilson, C.I.E., O.B.E., K.H.S., I.M.S., Surgeon General with the Govt. of Madras presided.

Dr. N. N. Sujeer, L. M. & S., the President of the Association welcomed the Surgeon General in suitable terms and wished Major General Wilson long life and peace in his retirement, as he is shortly to retire.

The Surgeon General thanked the members for giving him an opportunity to meet so many professional brethren and called upon the Secretary to give a resume of the activities of the Association during the year. The secretary giving a short account of the activities of the Association said, that in addition to the clinical meetings held during the year, due to the impetus given by Dr. T. S. S. Rajan, who was the President of the Association during the greater part of the year, the members participated in the Health Exhibition conducted at the time of the 2nd All India Khadi and Swadeshi Exhibition at Puthur Maidan, Trichy. They concentrated upon four subjects, i.e., Ante-natal service, Tuberculous survey, Propaganda of Nutrition and Diet, and Vaccination, and he hoped that with the guidance of the new President, Dr. N. N. Sujeer, the members would carry on more public activities. He then said that this Association which has been an active body for a number of years communicated to the Govt. its approval of the five year limit for the Honorary Medical Officers. He hoped that the Government would consult this Association on medico-political affairs as this is a branch of the Indian Medical Association. He wished that all medical men would join this Association so as to strengthen the same.

Major F. A. B. Sheppard, F.R.C.S., I.M.S., District Medical Officer, Madura then delivered an interesting lecture on Inguinal Hernia and he discussed in detail the various causes and the pathology of the same. He gave details of various kinds of operations and hoped that in future years statistics of recurrences might be gathered, which will be a great aid for improving the technique of different operations.

In his concluding remarks Major General Wilson thanked Major Sheppard for his illuminating lecture on Hernias and humorously remarked if ever he were to get hernia he would rush to Major Sheppard and get himself operated. He complimented Major Sheppard as one of the best Surgeons, not only in Southern India but, in India itself.

Major General Wilson then explained in detail the Re-organisation of the Honorary Medical Service which he has proposed to the Government and his scheme was that the Honorary Service should be divided into three sections i.e., for beginners there will be honorary Clinical Assistantship for two years, which would carry Rs. 50 p. m. and the next was Honorary Assistant Surgeonship and Physicianship, which would continue for five years and which would be recruited from the Clinical Assistants and would carry a salary of Rs. 75 per mensem. Next and the third would be the Honorary Physicianship and Honorary Surgeonship which would carry no remuneration, as experienced medical men are bound to give their services free to the poor. He said that the present Honorary incumbents are also eligible for the remuneration when the new scheme came into operation. To a question from a member he replied that mere possession of foreign qualifications would be no criterion for any appointment, but only experience and professional skill will be taken into consideration. To another question he replied that even retired people might be appointed as Honorary Surgeons and Physicians provided they are physically fit and mentally capable.

With a vote of thanks proposed by Dr. M. Balammal to the guests, Lecturer, President and the Host, the meeting terminated at a late hour.

(Sd.) P. A. S. RAGHAVAN,

Secretary.

## Trichinopoly Municipality

### Details of Public Health Activities during December, 1940

#### I. Vital Statistics:

|                                            |     |     |     |       |
|--------------------------------------------|-----|-----|-----|-------|
| Number of births registered                | ... | ... | ... | 561   |
| Number of deaths registered                | ... | ... | ... | 546   |
| Number of deaths from fever                | ... | ... | ... | 9     |
| Number of deaths from respiratory diseases | ... | ... | ... | 130   |
| Number of deaths under 1 year              | ... | ... | ... | 91    |
| Estimated birth rate                       | ... | ... | ... | 47.1  |
| Estimated death rate per mille             | ... | ... | ... | 46    |
| Number of deaths from child birth          | ... | ... | ... | 7     |
| No. of deaths from Alimentary disease      | ... | ... | ... | 113   |
| Infant mortality rate                      | ... | ... | ... | 162.2 |

#### II. Infectious diseases:

|                                      | Attack. | Death. |              | Attack.   | Death. |
|--------------------------------------|---------|--------|--------------|-----------|--------|
| Cholera                              | —       | —      | Measles      | —         | —      |
| Smallpox                             | 3       | 1      | Tuberculosis | not known | 36     |
| Chickenpox                           | —       | —      | Pneumonia    | not known | 74     |
| Typhoid                              | 1       | 1      | Diphtheria   | 2         | —      |
| No. of anti-cholera inoculation done | ...     | ...    |              | ...       | 22     |
| No. of anti-typhoid inoculation done | ...     | ...    |              | ...       | 11     |
| No. of vaccinations done:            |         |        |              |           |        |
| Primary vaccination                  | ...     | ...    |              | 491       |        |
| Re-vaccination                       | ...     | ...    |              | 2256      |        |
|                                      |         |        | Total        | ...       | 2747   |

#### III. Maternity and Child Welfare:

| (1) No. of cases visited by<br>Woman Medical Officer. | (2) No. of houses visited by<br>Health Visitor.  |
|-------------------------------------------------------|--------------------------------------------------|
| (a) Labour                                            | (a) Infants                                      |
| (b) Ante-natal                                        | (b) Pre-school                                   |
| (c) Post-natal                                        | (c) Ante-natal                                   |
|                                                       | (d) Post-natal                                   |
|                                                       | (3) No. of labour cases conducted by Midwives... |

145

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25

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164

## IV. Propaganda:

|                                                     |     |    |
|-----------------------------------------------------|-----|----|
| No. of lectures with magic lantern demonstration    | ... | 56 |
| No. of lectures without magic lantern demonstration | ... | 12 |

## V. Food adulteration:

|                                     |     |     |     |     |
|-------------------------------------|-----|-----|-----|-----|
| No. of samples taken                | ... | ... | ... | 14  |
| No. prosecuted                      | ... | ... | ... | 4   |
| Amount of fine imposed              | ... | ... | Rs. | 135 |
| No. of samples reported adulterated | ... | ... | ... | 4   |
| No. convicted                       | ... | ... | ... | 5   |

## VI. Meat Inspection:

|                        | No. passed | No. condemned |
|------------------------|------------|---------------|
| (1) Sheep              | 7276       | 112           |
| (2) Goats              | 3520       | 42            |
| (3) Cows and Heifers   | 302        | 4             |
| (4) Bulls and Bullocks | 125        | 12            |
| (5) Buffaloes          | 46         | 2             |

## VII. Dog Destruction:

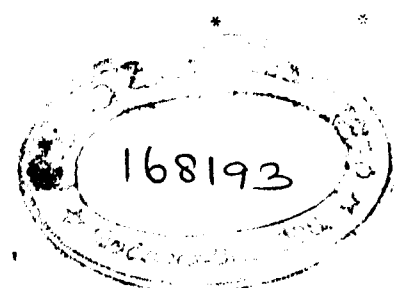
|                           |     |
|---------------------------|-----|
| (1) No. of dogs caught    | 196 |
| (2) No. of dogs destroyed | 187 |
| (3) No. of dogs released  | 18  |

## VIII. General remarks: Nil.

(Sd.) K. P. THOMAS,  
Health Officer.

That the English language has the worst spelling system may be seen in the following sentences:

"Though the rough cough and hiccough plough me through I ought to cross the lough."



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Printed by Rev. Fr. A. Susai Regis,

Superintendent, St. Joseph's Industrial School Press, Trichinopoly and published by  
Dr. T. N. Subramanian, L.M.&S., China Bazaar Road, Teppakulam, Trichinopoly—1941.