

## Correspondence.

## Massage Treatment for Consumption.

To the Editor of the SCIENTIFIC AMERICAN:

My communications on the subjects of "Immunity from Consumption" and the "Cause and Cure of Consumption," published in the SCIENTIFIC AMERICAN, March 19 and May 21, 1904, respectively, have brought forth so many earnest inquiries for further information in regard to the treatment of this disease—especially massage treatment—that I offer the following additional suggestions.

I do not claim to be familiar with the medical side of the question, neither have I ever attempted to diagnose the condition of the disease in any patient, because such matters belong to the province of the experienced physician. Such information as I have secured has been obtained by practical experience in giving several thousand massage or manipulating treatments to nervous invalids and tuberculous patients, and carefully noting the effect of such treatments on the mental, nervous, and physical condition of each patient. Any treatment which will benefit a nervous invalid will prove equally beneficial to a tuberculous patient, because tuberculosis is made possible only by a weakened or diseased condition of the nervous system.

In addition to the breathing exercises and other suggestions, mentioned in my previous communications, the proper kind of massage or manipulating treatment will prove of great value to the patient.

It is exceedingly difficult for me to write an understandable description of massage treatments. There are many ways of giving such treatments, but I will describe only the most important. In brief, only the balls of the fingers, and the ball (or fleshy part) of the thumb should be used in massaging any part of the body. The touch should be very firm and even, and the movement should be in perfect rhythm, and very slow; no strokes should be given more rapidly than the normal pulse rate, in fact, the best results have been secured by giving strokes of less than one per second. Rapid strokes, given with a heavy pressure more rapid than the normal pulse rate, produce an abnormal pressure on the walls of the veins and arteries, and will cause additional congestion and consequent inflammation of any inflamed parts of the body; but the very firm, slow, and rhythmic strokes will produce no harm under any conditions. Heavy pressure should not be used directly on any part of the body which is sufficiently inflamed to be painful or sensitive to the touch. Treat around the part until the congestion is relieved and the soreness removed.

An ideal massage treatment is one which will secure for the patient all the benefits to be derived from the old forms of treatment, without causing him any pain, or consequent nervous irritation, and without requiring him to use any physical strength to resist the pressure of the treatment, thus enabling him to remain in a perfectly relaxed condition during the entire treatment. This can be accomplished as follows: When you are giving the treatment with one hand, the other hand should always be used to provide a counter pressure—no matter what part of the body is being treated—thus relieving the patient from physical strain.

All massage manipulation should be made toward the heart. The treatment on the back should be given by the ball of the thumb, and it should be given the whole length of the spine, placing the left hand on the chest to provide a counter pressure, which will save the strength of the patient. In giving this special treatment, the pressure should usually be from the neck toward the end of the spine, the object being to relax any contracted muscles, and, at the same time, to stimulate and strengthen all nerves connected with the spine. Another very important treatment is given as follows: With the patient lying on his back, use the balls of the fingers only, and with a perfectly even, firm, and rhythmic pressure, massage the entire neck from the spine forward to the clavicle (collar bone), also from the base of the ear down the neck and under the jaw, the object being to stimulate and strengthen the pneumogastric and other nerves leading from the brain and spine which supply the heart, lungs, stomach, and diaphragm with their motive power. This same form of treatment should be continued all the way down the spine, the movements being given from the spine forward and over the sides of the patient.

The external massage or kneading of the bowels should not be given under any circumstances, because such treatments are usually disagreeable and painful to the patient, frequently causing much harm, and in no case can they do much good, in fact, they are unscientific and unnecessary. The question to be considered is not, can the patient stand the pain or nervous irritation of such treatments, but can he afford the loss of nervous force caused by them? In treating the arms and legs, all massage movements should

be made toward the body, in order to assist the venous circulation. It has hitherto been the practice to commence with the fingers or wrists, and make the strokes to the shoulders, although some masseurs give one stroke from the ends of the fingers to the wrist, and then from the wrist to the elbow, and, again, from the elbow to the shoulder. I commence at the shoulder, gradually approaching the fingers; also from the thighs, gradually approaching the feet—making all strokes toward the body—thus trying to relieve the valvular or other obstructions in the veins or lymphatic vessels singly, in place of several of them at one stroke—which is impossible.

There may be a difference in opinion about valvular obstructions in the veins and lymphatic vessels, but I know, without a doubt, that this system of treating the limbs improves the circulation of the blood, not only more quickly and more effectively than the old way, but also without irritating the nerves of the patient—thus adding to his comfort and saving his nervous force. If the loss of nervous force makes tuberculosis possible, and if an abundant supply of it will cure the disease, then it is of the utmost importance that we keep that idea in our minds continually, and make it our constant study how both to save and develop the nerve force in the tuberculous patient.

From personal observation, I am fully convinced that the fundamental cause of tuberculosis, or any nervous affection, is the loss of nervous force through irritation of the mind resulting from mental or physical causes; but the first injurious effect of such irritation seems to be transmitted to the pneumogastric and other motor nerves, and is usually followed by a corresponding weakness of the lungs, heart, liver, and stomach; but when the roots or base of the pneumogastric and other nerves are stimulated and strengthened by a proper massage treatment, they very quickly commence to recover their strength, and the weakness of the internal organs begins gradually to disappear. This rule, which applies to the lungs, heart, liver, and stomach, also applies to the bowels and all of the internal organs. If you can strengthen the nerve centers and roots of the motor and other nerves which impart life and vigor to these organs, you will find that the unscientific massage treatments—by kneading, twisting, pinching, and slapping—can be abandoned.

It is unnecessary for me to mention the necessity of having a proper diet, plenty of fresh air, and proper sanitary surroundings for the tuberculous patient, because the medical profession, and especially the boards of health of this and other cities, have done splendid work and accomplished wonders in educating the people in regard to the importance of these requirements.

I do not pretend to claim that massage is the only treatment necessary to cure tuberculosis, and, as is well known, medical treatment alone cannot cure it; but I believe that the combination of these treatments, together with suitable diet, pure, dry air, proper environments, and sanitary surroundings—all under the guidance of the experienced physician—can completely master, in its early stages, a disease which has destroyed millions of lives in all parts of the world.

CYRUS L. TOPLIFF,

Member of the National Association for the Study and Prevention of Tuberculosis.

New York, November 24, 1904.

## Vacuum Tubes.

To the Editor of the SCIENTIFIC AMERICAN:

The article under the above title by C. M. Broomall in your issue of November 26 recalls an observation made by the writer. One evening a few years ago, after having given an entertainment with Geissler, Plücker, and other vacuum tubes, it was observed that one of the long Geissler tubes, while lying on the table, with connecting wires removed, would light up with a beautiful glow characteristic of that tube, when the hand was moved quickly along its surface. Contact with the glass was not necessary to excite the luminosity, but simply a quick movement parallel with the axis of the tube. When the hand was allowed to come in contact with it, the glow was attracted to that side of the tube which was touched; and when the fingers were applied to the electrode terminals, the glow became much brighter for a second or longer, then gradually died out. Even two hours after having been excited by the static machine, this tube exhibited the glow, though quite feebly. The glow appeared to be excited by induction, and to depend upon a residual charge in the tube.

Like the experiments of Mr. Broomall, this may be a common phenomenon, but many may not have observed it, and many would doubtless be pleased to see an explanation in your columns. W. H. HOWARD.

United States Patent Office, Washington, D. C., November 29, 1904.

An 8-foot steel chimney, 230 feet in height, has just been completed and will be erected in Mexico. This will be the highest steel chimney in America.

## A Simple Photographic Method of Reproducing Pictures.

BY CHARLES E. FAIRMAN.

It often happens in the life of nearly everyone that for some purpose a copy of some picture, drawing or manuscript is desired, and the person may not be so fortunate as to own a camera, and may also be entirely ignorant of photographic manipulations. In this process but little is needed in the way of apparatus with the exception of a printing frame, and some of the simpler forms of printing paper such as blue-print paper, self-toning Aristo, or sepia or water developing platinum paper. These papers are inexpensive, and the directions contained with each package are so explicit that the novice can fully understand the manipulation required.

The first requisite of all photographic printing is a negative of some kind. For the purposes of this process we select from our stock of pictures or manuscripts or drawings the subject which we wish to reproduce, and by drawing the picture through a shallow dish filled with melted paraffine the picture is rendered translucent so that it can be used in the printing frame, and from this a negative is made by placing a sheet of some one of the printing papers mentioned with the coated side in contact with the face side of the picture to be reproduced.

With the printing paper printed and manipulated according to the instructions given with the paper, we will have as a result a negative on paper which should be treated with paraffine in the same manner as the original picture. This gives us a translucent paper negative from which any number of positive pictures may be printed.

In preparing the original picture with paraffine, and also the resulting negative, it is important that as thin a coat of paraffine as can be secured should be left on the negative or picture. Thick coating is apt to result in the smearing of the surface when the negative is used in the printing frame, and the smears showing in the resulting print, add a far greater blemish than the original grain of the paper would give.

The surplus paraffine may be removed by placing the picture or negative in the oven, suspended by a small clip. Sheets of blotting paper laid upon an asbestos plate at the bottom of the oven to receive the drippings from the negative should be used. The heat of the oven will cause the surplus paraffine to drip from the surface of the negative, leaving a much smoother surface than can be obtained by placing the negative between sheets of blotting paper and using a hot iron to remove the superfluous coating.

The uses to which this simple method of reproduction can be applied are nearly as varied as the different kinds of drawings or pictures which are of common use.

Combinations of pictures and manuscript may be arranged by using a sheet of vegetable drawing paper as a base and arranging upon this the pictures and manuscript, using a little Canada balsam as an adhesive. From this combination a paper negative with the whole subject matter on one sheet is obtained, and the subsequent steps will readily suggest themselves.

For advanced photographic workers it is suggested that a much softer negative with a lack of sharp harsh contrasts can be secured by this method and for exhibition work it seems to offer possibilities not before recognized.

By the use of rapid bromide of silver paper, prints may be made without the preliminary waxing as above mentioned. The thin sheet of sensitized paper may be laid upon the print to be reproduced with the sensitized side upward, and exposed in the usual way in the printing frame, for a second or two to subdued day light or to an artificial light. It is then removed from its frame and developed and fixed in the dark room. If the subject is a drawing white lines will be reproduced with the figures and letters in the right position against a dark background. Manuscripts may be quickly copied in this way, where the writing is on one side of the sheet, quite perfectly and will show the texture of the paper, including any special water marks.

A discovery of great interest to bakers has been made by an English inventor, Mr. Pickering, whereby the making and baking of bread is considerably expedited. Hitherto the dough has required from four to ten hours to leaven before it was ready. This is a serious disadvantage, for not only does it delay the manufacture of the bread, but owing to the dough being an excellent medium for the culture of bacteria, the longer it remains unbaked, the more bacilli accumulate to help to sour the loaves. By the Pickering process the action of the yeast is expedited, and the dough is ready for baking in ninety minutes. A practical demonstration was recently carried out in a London bakery. After special treatment yeast was added to 28 pounds of flour, and dough made. Fifty-nine minutes after the flour was converted into dough, it had risen sufficiently to be sent to the oven.