

cases. Moreover, the educated layman will more and more resent the attempt. I think it will not be long before it will be held as presumptuous for us to attempt to prescribe by general rules a man's best way of living, as it would be for us to prescribe his wife, his profession, his political or religious opinions. Private judgment and unwillingness to submit to authority will spread to this sphere, nay, have already spread far in that direction.

We will recur for a moment to our own plans. Our belief is (as we have tried to indicate) that the hygiene of the future will be not a series of commands, "Thus do or thou shalt die," but a map showing a number of practicable roads, each preferred and found satisfactory by a group of persons of a certain build, a certain ideal of life, a certain inherited and acquired set of the tissues. "On or near some of these roads," we shall say, "you will probably travel. Look them over as you do in choosing a profession, a house or a town to settle in. Find out which suits you best; then take it."

Now, our ambition is to assist in the construction of this map, to find out by the collection of an enormous body of statistics of healthy people what workable sets of habits now exist in regard to food, water, exercise, sleep, work, recreation and the rest. Such a map of passable roads will not bind the individual to walk on any one of them, but if he wishes to roam in the fields or ditches he will at least be conscious of what he is doing and where the ordinary roads are if he cares to return.

To collect the body of statistics on which such a map could be based will need the coöperation of many intelligent persons all over this country, and later we shall be asking members of the profession to coöperate with us in the task.

THE EFFECTS OF TOBACCO UPON THE THROAT.*

BY S. W. LANGMAID, M.D., BOSTON.

I HAVE been induced to write this short paper because my experience of the evil effects of tobacco on the throat, especially by smoking, has been contrary to what is generally taught in textbooks, and because very little has been written on the subject and no record of clinical observations has come under my notice. The subject has generally been dismissed with an opinion for which no good reasons were offered.

For many years I have been compelled to believe that smoking is responsible for certain forms of throat disease, or is an added factor in the injurious effects of climate.

I must acknowledge that my observations have been made in a cold, moist climate, such as exists in winter all along the seashore of the northern United States, and may not hold good in other, warmer or warm-moist climates. Indeed, I am inclined to believe that such is the case. But should it be urged that climate alone might be considered responsible for the affections of the

throat, I might reply that until tobacco is abandoned there is very little or greatly delayed response to treatment.

The condition of the throat which I have observed is that so exhaustively treated and so truly described by Bosworth in his chapters on acute naso-pharyngitis and naso-pharyngeal catarrh. Bosworth, although admitting that tobacco may be an irritant to the pharyngeal mucous membrane, says that he "has always considered the nicotine absorption to be the vicious factor in its use." He admits that the ammoniacal vapor and possibly the small quantity of pyroligneous acid may act as irritants, and that it is frequently noticed that a patient suffering from naso-pharyngeal catarrh is greatly inconvenienced and his trouble even aggravated by smoking, and that in such cases it is necessary that the habit should be abandoned. But, he says, "the cases are the exception rather than the rule." My belief is that in all cases of acute and chronic naso-pharyngitis smoking must be abandoned or the cure is delayed. Especially is this the case if cough is a prominent and distressing symptom.

Diseases of the nose and throat. — Although I believe that much of the hyperemia of the pharyngeal mucous membrane may be due to irritation of the smoke from the burning tobacco, I am forced to believe also that the poisonous effects upon the nervous system may be to a large extent responsible for the vasomotor disturbances which are plainly visible in the throat of all smokers. I believe that most of us could hardly make the mistake of not recognizing by the appearance of the throat the non-smoking man even if he should not apply to us for treatment of a naso-pharyngitis. It has been my custom to make such a diagnosis greatly to the astonishment of the patient. Furthermore, I think the appearance of the throats of most female patients will be noticed to be unlike that of men even when the pharyngeal mucous membrane is acutely or chronically diseased.

I am inclined to believe that it is largely due to the poisonous action upon the nervous system that tobacco plays such a part, as it seems to me, in producing and perpetuating disease of the throat. The following extracts from recent articles on the action of excessive smoking upon the organs of special sense may seem to you to afford justification for such an assumption.

Possible etiological factor in tobacco. Alcohol amblyopia. — "G. E. de Schweinitz and Edsall¹ attempt to throw some light on what the possible poison may be which produces one or the other of the many changes which have been described by many authors in the optic nerve fibres, or the ganglion cells of the retina, and which manifest themselves by the clinical symptoms."

"Horner, long ago, and de Schweinitz, 1900, suggested that the disease depended on a species of auto-intoxication, and the investigations of Sachs and Casey Wood indicate 'that certain stomach toxins are capable of causing in animals

* Read at a meeting of the American Laryngological Association at Atlantic City, N. J., June 3, 1904.

¹ Trans. Am. Ophth. Soc., 1903.

blindness, probably of the type now under consideration.' In seven there were evidences of marked disturbance of digestion or metabolism or of both."

*Tobacco nerve deafness.*² — Wyatt Wingrave gives the results of his observations of seventeen cases as follows: (1) "That they were all well marked cases of nerve deafness (unattributable to other causes) occurring in heavy smokers. (2) That the loss of low tones in 50% suggests an auditory equivalent for a recognizable ocular lesion. (3) That the disease was symmetrical. (4) That there was an impairment of color sense in eight of them, and definite scotoma in four cases. (5) That 80% showed marked improvement on abstinence from tobacco supplemented by drug treatment; three were cured.

"Tobacco smoking. — Besides nicotine, tobacco smoke contains nicotianine, collidine and other pyridine derivatives, acids, resins, carbon dioxide, prussic acid and ammoniacal salts. Two drops of nicotine placed on a dog's tongue produce, in succession, efforts to swallow, great weakness, convulsions and death, in less than a minute. Eight drops will kill a horse. Tobacco contains from 2 to 8% of nicotine and Le Bon has determined that though most of this is changed in smoking, it appears as other pyridine bodies which are just as poisonous."

Petit³ finds "that these bodies do not condense much in the warm mouth, so are mostly exhaled, therefore the physiological effect of ordinary smoking is not a marked one. Susceptible persons may, however, be much affected by breathing the air of a room in which there is much tobacco smoke.

"The poisonous constituent of tobacco smoke. — The gaseous products of the incomplete combustion of tobacco, whether it be smoke in the pipe, cigarette or the cigar, are so complex that the question, To which constituent are the toxic effects of tobacco smoking precisely due? remains unanswered. Of course, it is well known that nicotine is a powerfully poisonous constituent of tobacco leaf, but it is by no means certain that the alkaloid reaches the system by way of the smoke in sufficient quantities to act seriously as a poison. To begin with, the amount of nicotine in tobacco is very small, and there is reason for believing that the quantity given in previous analyses has been considerably over-represented; moreover, though a volatile poison, nicotine does not occur in the free state in tobacco, but as an organic salt, which is not volatile, and which probably breaks up readily on combustion. It is doubtful whether a seventh part of the total nicotine in the tobacco reaches the mouth of the smoker, and some investigators deny that any nicotine occurs in tobacco smoke at all. But assuming that nicotine is the toxic constituent of smoke, the quantity must be quite minute, since in most mild tobaccos the proportion is rarely over 1%. On the other hand, the incomplete combustion of tobacco gives

rise to the formation of aromatic compounds, oils, bases, amines and gases, some of which are undoubtedly poisons, and these are obviously produced in a far larger amount compared with the quantity of nicotine in tobacco.

"In this connection too little attention seems to have been paid to the relatively large quantity of the poisonous gas — carbon monoxide — in tobacco smoke. When the insidious nature of the gas is considered its absorption in the system, which must be very rapid when inhalation is practiced, would sufficiently explain the train of poisonous symptoms which excessive smoking is apt to set up. In some particulars the physiological action of nicotine and carbon monoxide is similar. The dizziness and stupor, the trembling of the limbs and the hands, the disturbance of the nerve centers and the circulation, palpitation on a slight effort, and the feeble pulse may be the indications of either carbon monoxide or nicotine poisoning. But since one ounce of tobacco gives no less than one fifth of a pint of pure carbon monoxide gas when smoked in the form of cigarettes — and probably as much more in the form of cigars or in pipes — it is not improbable that to a very large extent these symptoms are due to the carbon monoxide.

"We have recently tried the following instructive experiment which bears upon this point: Two or three mouthfuls of tobacco smoke from a cigarette were shaken up with a few drops of blood diluted with water in a bottle. Almost immediately the blood assumed the pink color characteristic of blood containing the gas, and further observations with the spectroscope confirmed the presence in the blood of carbon monoxide. Similarly a few mouthfuls of smoke from a pipe and a cigar were tried, and the results were even more marked. In this experiment we have some explanation in particular of the evil effects of cigarette smoking, for it is chiefly cigarette smoke that is inhaled — an indulgence by which the poisonous carbon monoxide is introduced directly into the blood. This effect of tobacco smoke upon the blood appears to be of considerable significance." — *Lancet*, Jan. 2, 1904.

The above statements seem to offer sufficient evidence of the poisonous action of excessive smoking upon the nervous system. The ophthalmic and the aural surgeons have never doubted their effect upon the organs of special sense.

Clinical evidence, is to my mind, sufficient to prove similar action on the throat. The smoker is never quite free from a form of naso-pharyngitis, and sooner or later a mild form of tracheitis appears and becomes chronic. The naso-pharyngitis may reveal itself by the necessity for frequent hemming, or, as frequently occurs, by a morning cough which in some cases is so severe as to cause vomiting which is frequently ascribed to "catarrh of the stomach."

Not infrequently when the naso-pharyngitis becomes acute, as it frequently does in winter, a most distressing night cough appears, convulsive in its nature and resembling the constantly repeated cough of the child with naso-pharyngeal

² Ann. of Otol., Rhinol. and Laryngol., September, 1903.

³ Le Progrès Médical, Nov. 28, 1903.

adenoma. The cause for such a cough is not suspected by physician or patient, and demulcent medicines having been found inefficacious resort is had to opiates with the result of destroying the patient's digestion, and the usual systemic disturbances follow.

I have frequently found that the cough would quickly disappear if smoking was discontinued, internal medication being limited to the giving of a placebo, but if the smoking was continued, or not materially lessened, the cough would continue, or, with intermissions, return during a period of months.

But I would call attention especially to the effect of tobacco upon the throat and voice of singers. I have refused for many years to treat the throat of singers and public speakers where smoking was not discontinued, since I believe that treatment which otherwise would be efficacious would be of little avail.

The specialist is frequently consulted by a singer or actor for hoarseness which prevents a public appearance. The pharynx and larynx are hyperemic, the secretion of glutinous mucus is excessive, but the real reason for altered quality of voice or its extinction is found in the paresis of the intrinsic laryngeal muscles. Either one or both vocal bands are relaxed and the upper register of the voice is lost. In such cases a few days or hours of rest of the voice and the treatment which any skilled specialist would apply would be sufficient to restore the voice to a working condition. But the patient must be told that unless he ceases to smoke relief will be delayed. If it should be said that such a condition may result from over use of the voice or from climate, or both, I shall certainly agree, but would yet maintain that smoking not only helps largely to provoke such attacks, but that it retards the restoration of the vocal ability.

I believe, then, that tobacco smoking is not only harmful to the throat as a direct irritant, but that it produces vaso-motor disturbances of the pharyngeal mucous membrane by its poisonous effects upon the nervous system.

One can be materially aided by stopping smoking for a time. I have found this method of treatment to be productive of good results in many cases.

With regard to the effect of tobacco upon singer's voices, I have known several singers who have tried to smoke when the throat was affected, but who were obliged to give it up. I am willing to admit, however, that deep voices, such as baritone, bass, or contralto, are not so easily affected by tobacco smoke as are the higher voices, viz., the tenor and soprano, since the beauty of tone in the lower pitched voices does not depend, for reasons foreign to the scope of this paper, upon the absolute integrity of the vocal bands.

FIVE YEARS OF MEDICAL STUDY.—It is stated that an optional fifth year will be offered at the Rush Medical College in affiliation with the University of Chicago, with varied possibilities of study, including an internship under certain modified conditions.

STUDIES ON EPILEPSY.*

BY ARTHUR MORTON, M.D.,
AND
MORGAN B. HODSKINS, M.D., PALMER, MASS.,
Assistant Physicians, Massachusetts Hospital for Epileptics.

TREATMENT OF STATUS EPILEPTICUS.

BY ARTHUR MORTON, M.D.

LAST year an article was written describing the treatment of status epilepticus at the Massachusetts Hospital for Epileptics. During the past year, the same general line of treatment has been carried out. We have, however, been especially interested in the use of a sterile solution of sodium bromide given hypodermically and in lumbar puncture. The consideration of these two agents will form the basis of this article.

In the use of a sterile solution of bromide, we feel that we have a very valuable method of treatment of status. Last year we could report on only four cases; but during the past twelve months we have used it in many cases and generally with good results.

We experimented for several months with the different bromide salts and with solutions of different strengths, and finally came to the conclusion that the best results were obtained with a solution of the sodium salt of the strength of 30 grs. to the ounce. Stronger solutions than this are too irritant and are apt to produce abscesses. The solution even in this strength should never be injected in large quantities into the thighs or breasts. Out of several thousand injections of this solution, we have had but two abscesses and these occurred after about an ounce of the solution had been injected into the thighs. We have, however, had several cases of sore and indurated breasts. The induration rapidly disappeared under the use of a glycerine poultice and none of the breasts suppurated.

The site we select for the injection is on the back just below the angle of the scapula. Here several ounces of the solution may be injected without fear of abscess formation.

Some authors recommend the use of a 10% solution of sodium bromide; but we have found that this is much too strong and very apt to produce abscesses or painful indurated areas. Other advantages that might be mentioned in favor of the weaker solution are its diuretic and stimulating effects. In these respects its action is much the same as that obtained by the subcutaneous use of normal salt solution.

The amount of bromide injected varies in different cases; frequently 60 to 100 grs. will control the convulsions; but we sometimes have to inject 180 grs. or 6 oz. of the solution before the desired result is obtained.

The earlier in a case of status the injections are commenced the better. Perhaps the most useful purpose of this solution is in aborting threatened attacks. During the past year we have given directions to the head nurses that if certain patients, who are apt to have series of convulsions

* The following papers were read in part at the Annual Meeting of the National Association for the Study of Epilepsy held in Boston, Nov. 22, 1904.