

Welcome to the book *Diseases of Modern Life*, by Benjamin W. Richardson, M.D., M.A., F.R.S. (1876), the tobacco portion only. To go to the "[Table of Contents](#)" immediately, [click here](#).

Tobacco pushers and their accessories conceal the breadth of [tobacco effects](#), the enormity of the tobacco holocaust, and the long record of documentation.

The concealment process is called the "[tobacco taboo](#)." Other pertinent words are "censorship" and "disinformation."

Here is the text by Benjamin W. Richardson, M.D., M.A., F.R.S. (1828-1896) of an early exposé (1876) of tobacco dangers, but being a pro-tobacco individual, he denied some effects pursuant to the "[tobacco taboo](#)."

The phrase "[tobacco taboo](#)" is the term for the pro-tobacco censorship policy—to not report all facts about tobacco.

Dr. Richardson in 1864 had "published a series of essays on diseases. . . . These essays were followed by others on disease from some occupations, from indulgence in alcohol, and from the use of tobacco." This 1876 book "undertook to republish them in a collected form."

As you will see, information about the tobacco danger was already being circulated (even by pro-tobacco writers) before 1876, itself 88 years before the famous 1964 Surgeon General Report. Be prepared.

***Diseases of Modern Life***  
by Benjamin W. Richardson, M.D., M.A., F.R.S.  
(New York: D. Appleton & Co, 1876)

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## CHAPTER X.

### ON DISEASE FROM TOBACCO. —PHYSIOLOGICAL PHENOMENA.

THE influence of tobacco on man forms a subject for discussion on which the extremest views prevail. On one side tobacco has been held up as the most harmless of luxuries; a soothing luxury that quiets the irritable nervous organism, relieves weariness and entices repose. On the other side it has been denounced as [the originator](#), not only of mere functional disorder, but of some of the worst forms of organic disease, such as [cancer](#) and [consumption](#). I shall strive in dealing with this subject to put forward the actual facts, following as my guide no authority except the natural authority itself, derived from the direct observation of the effects produced by the agent in question upon the animal body.

The smoke of tobacco inhaled by the smoker is, chemically, a [rather complex substance](#). To ascertain what the active parts of it are, I constructed a small pair of bellows which would act like the

lungs when a man is smoking a lighted pipe or cigar. Part of the smoke produced by the combustion was allowed to escape from the lighted end of the pipe or cigar in the ordinary way: the remaining part was drawn into the bellows as it would be into the lungs, and thus obtained it was submitted to examination.

To make the examination still more certain, different specimens of tobacco were used and different kinds of pipes were also employed,—the fine porcelain bowl and stem, the small cutty, the long churchwarden, the pure virgin clay, the black odorous "coloured" clay, the meerschaum new and "coloured," and the wooden pipe new and old.

#### *Composition of Tobacco Smoke*

We shall see as we progress that differences prevail in respect to the action of differing kinds of cigars, differing kinds of tobacco, and differing pipes; but it will be well, as a preliminary, to lay before the reader an account of the substances which are common to all varieties of tobacco smoke. For, it is to be observed that such differences as exist are due to quantity rather than to quality, and that in every variety of the smoke there are present certain bodies of which it may be said to be composed.

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The result of my inquiries showed that there exists in tobacco smoke the following **constituent parts**:—*Water* in the state of vapour; free *carbon* diffused in very minute particles, or soot; some *ammonias* existing in a state of vapour, and giving to the smoke an alkaline reaction; *carbonic acid*, and *carbonic oxide*, each in the state of gas; and a product coming over, also in vapour, but easily condensable into an oily-like substance, crude *nicotine*. This nicotine was in turn found to be complex. It yielded a fluid alkaloidal body, *nicotine proper*, a *volatile empyreumatic substance* containing an ammonia, and a dark resinous bitter *extract*.

In the hands of other inquirers these products of the combustion of tobacco have been split up into still more refined divisions. Eulenberg and Vohl passed the smoke of tobacco through a strong solution of potassa, and afterwards through a dilute solution of sulphuric acid. The solution of potassa separated carbonic, acetic, formic, butyric, valeric, and other acids, including even hydrocyanic or prussic acid, together with creosote and some hydrocarbons. The acid solution fixed ammonia, and a series of oily bases belonging to those homologues of aniline which Dr. T. Anderson first discovered in coal tar. These bases run parallel with aniline, and under the action of iodide of ethyl yield ammonium

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compounds. They are composed of the elements carbon, hydrogen and nitrogen, and they differ in physical, and probably in physiological qualities, according to their atomic weight. The lightest of them is pyridine, composed chemically of  $C_5H_5N$ ; the heaviest, is viridine,  $C_{12}H_{19}N$ ; and intermediate are picoline  $C_6H_7N$ , lutidine  $C_7H_{13}N$ , collidine  $C_8H_{11}N$ , parvoline  $C_9H_{13}N$ , coridine  $C_{10}H_{15}N$ , and rubidine  $C_{11}H_{17}N$ . Pyridine was found to be most abundant in smoke from tobacco, and picoline, lutidine, and collidine in smoke from the cigar.

The various chemical bases here described are obtained from tobacco when the combustion of it is very rapid and perfect. Then the adhesive resinous matter which I described in a preceding paragraph is completely decomposed and resolved into new

products. It would, however, be wrong to suppose that In the ordinary process of smoking these products are all formed and inhaled. They are not. In the common combustion of the pipe or cigar the substances I enumerated in the first paragraphs under this head are those that need, chiefly, to be remembered. These I believe are invariably formed, and the effects produced on persons who indulge in smoking are traceable readily to their action.

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*Effects of the Constituents of Tobacco Smoke on the Body.*

The **effects** produced by the smoke are compound, owing to the different agents present in it, more than one of which must be considered active. The water may be set down as harmless; the free carbon acts mechanically as an irritant, and in confirmed smokers discolours the secretions of the bronchial tubes and even the hard structures of the mouth, such as the teeth. The free ammonia plays a very important part: it is the ammonia that bites the tongue after long smoking; that makes the tongue and throat of the smoker so dry, inducing him to quaff as he smokes, and that excites the salivary glands to secrete so freely. The ammonia also exerts a solvent influence on the blood. The carbonic acid differs so greatly in amount, from various specimens of tobacco, that it is difficult to estimate the extent of its action, but its tendency is to produce sleepiness, headache, and lassitude. The carbonic oxide, like the carbonic acid, varies in amount: if the combustion of the tobacco be slow and incomplete, it is present in small quantities, but if the combustion be rapid it is absent. When present it is a very active, poisonous agent, producing drowsiness, unsteady movements of the heart, tremulous or even convulsive movements

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of the muscles, and vomiting. The effect of nicotine proper is to produce tremor, palpitation of the heart, and paralysis. The volatile empyreumatic substance causes a sense of oppression and gives an unpleasant odour to the breath; it is in fact this substance which causes the peculiar smell in what is called stale tobacco smoke, and which hangs so long In the breath of the smoker and on articles of his clothing. The bitter extract is the substance which communicates the exceedingly nauseous, sharp taste recognised by every unpractised smoker who takes a foul pipe in his mouth: it excites vomiting in persons unaccustomed to tobacco, but after a time this effect of it ceases. It would lead me, into an unnecessary minuteness of detail to indicate further the specific effect on the body of the chemical compounds named above. I therefore proceed to consider briefly the effects of tobacco in its compound form, as they are commonly seen in those who indulge in the habit of smoking.

*Primary Action on the Body.*

The action of tobacco extends widely through the animal kingdom. We place a few mites from a cheese under the microscope, and direct upon them a current of tobacco smoke from an ordinary pipe. In a few seconds the little animals

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reel over, become convulsed, and even appear to die; but on them the effect of fresh air is active, and as the poisonous vapours exhale readily from their bodies, they recover.

On flies and bees and wasps the same effects may be observed. Cold-blooded animals succumb slowly to the smoke, birds rapidly. On all warm-blooded animals the symptoms it produces are powerfully marked and are the same in character. Some animals, such as the goat, can eat large quantities of tobacco with impunity, but even these animals do not escape from the effects of the fumes.

The symptoms from inhalation show themselves quickly in man. I myself once inhaled the product from one pipe holding sixty grains of tobacco, the said product being diffused through five thousand cubic inches of common air: within four minutes the signs of specific tobacco-poisoning set in, and I was compelled to cease to inhale.

The first impression made by the smoke of tobacco is through the blood, and inasmuch as the whole volume of blood courses through the body in from three to five seconds, the indications of its effects, from the many compounds of which it is composed, are felt universally in the young smoker. After a short time, as the blood becomes charged with the poisons, the organic

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nervous chain and the organs it supplies are powerfully impressed.

The stomach is the first to give indication of suffering, and an effort is made through that organ to eliminate certain of the offending substances. If the poison cease to be taken in at this point, or if the quantity that has been received be not immoderately large, recovery commences, the surface of the skin resumes its healthy colour and temperature, and after a few hours the ordinary functions of life are once more naturally performed. For, tobacco is not a poison that leaves important disease of any particular organ or class of organs in its track; if it did, that mischief, which would soon have been detected by physicians, would have excluded it long since from the list of luxuries.

If the process of poisoning be continued beyond the point to which we have followed it, the brain and nervous system next become affected; there is now presented an inability to stand steadily, and to make a sure grasp of objects near, the body seems to whirl, and all things around to reel, —effects which are soon followed by involuntary action of the muscles, and by convulsions which are often intensely severe. In extreme cases, this muscular spasm extends to the muscles of the chest and to the heart, and thereupon succeed a deathly faintness and tremor. I once saw a

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boy who, while "learning to smoke," induced in himself, from the first few pipes, these signs in a degree that was most painful to witness: his heart having nearly ceased to beat, his sensation of impending death was terrible, while through his chest, which was spasmodically fixed, there darted, whenever he attempted to breathe, a pain short and sharp as an electric shock. These spasmodic seizures lasted for many hours.

Pushed to an extremity, the symptoms terminate in death from arrest in the beating of the heart.

The extreme symptoms induced by tobacco smoke are intensely severe, and the idea that tobacco is a narcotic like opium or chloroform is entirely disproved by them. Its action is as an irritant upon the motor parts of the nervous system, not as a narcotic upon the sensational.

It will be asked—what are the conditions of the organs of the body during the time that a person who is learning to smoke is undergoing his penance? As regards the human body, neither I nor any other physician could speak with certainty, for the facts have not been observed; but from analogy derived from the inferior animals, which analogy must be very perfect, the conditions of the vital organs are as follow. The brain is pale and empty of blood; the stomach is reddened in round spots, so raised and pile-like, that

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they resemble patches of dark Utrecht velvet; the blood is preternaturally fluid; the lungs are pale as the lungs of a calf, when we see them suspended in the shambles; while the heart, overburthened with blood, and having little power left for its forcing action, is scarcely contracting, but is feebly trembling, as if, like a conscious thing, it knew equally its own responsibility and its own weakness. It is not a beating, it is a fluttering heart: its mechanism is perfect, but each fibre of it to its minutest part is impregnated with a substance which holds it in bondage and will not let it go. Tobacco, then, if it be a friend, is not very friendly at the first introduction; fortunately, or unfortunately, it becomes milder as it grows more familiar.

*Secondary Action on the Body.*

The body, after being subjected for a few times to the poisons of tobacco smoke, becomes accustomed to their influence, and ceases to offer any of the more serious signs of opposition. There is set up what is technically called "a tolerance," and the direct mischief seems to be over. The "tolerance" thus brought about is not peculiar to tobacco as a poison. There are many other substances which in like manner are tolerated after a time. Antimony, as a ready example, is one of

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these. In fact, the body adapts itself to many impressions and influences which at first sight are objectionable, by virtue of a limited physical power it possesses of distributing the offending substances and relieving itself of them. This occurs in respect to tobacco. After a short time the products of the tobacco find a ready exit out of the system. They are thrown out by the three great eliminatories—the lungs, the skin, and the kidneys. The volatile matters exhale by the lungs. We have evidence of this in the empyreumatic and ammoniacal breath of every smoker. In confirmed and inveterate smokers, their very garments, after a short wearing, become impregnated with the odour of tobacco, and we say that the smoke hangs about their clothes, as though it had simply fallen on the clothes from without, but the vapour has in truth exhaled from the skin, and saturated the clothing. The clothes of some moderate smokers are also intensely fumigated; so that in whatever company they go, and however they may dress, they bear with them the evidence of their indulgence. A gentleman who was a very moderate smoker once consulted me on this subject, telling me, "If I smoke but a single pipe or cigar I carry it about with me for half a day, whereas my brother smokes a dozen pipes and nobody would suspect half an hour afterwards that he had smoked at all." These

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observations are commonly made, although the causes of the phenomena are not understood [by laymen]. Nevertheless, they may be understood. When the moderate smoker carries about with him the odour of tobacco he has some defect in his breathing: he cannot eliminate by his lungs with the rapidity he should, so the odours hold to his breath, and the skin doing more work than is natural to it, in order to relieve the lungs, lets products pass off by it also, thereby saturating the clothing with the perfume. Thus one of our old herbal books says of tobacco: "It were a fine cure for asthmatics, did it not render them much more disagreeable to politeness than it doth other men who do attach themselves to it the more."

Every smoker is cognizant of the circumstance that there are times when he himself is more redolent than he ought to be, and of times when his appetite for the weed is reduced to a minimum; and, if he inquire into the cause of this, he discovers it to be due to an arrest in some active secretion. He tells us on such occasions that "his liver is out of order," which is a sufficiently uneducated way of speaking for the physiologist, but which conveys, nevertheless, the idea of a series of perverted functional changes that are now pretty well understood as indicating a suppression of function in the lungs. We thus account for the removal from the

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body of the volatile tobacco poisons; but what of the nicotine and the bitter extract? At the temperature of the body, nicotine cannot be considered a volatile substance, and the bitter extract is a soluble solid. Both, I believe, are carried off by the kidney, the grand eliminator of all poisons of the soluble type.

When the facts I have now stated are impressed clearly on the mind, the evils of slow tobacco-poisoning are easily followed. These evils are transitory, and the influences exerted are functional, not organic. In the confirmed smoker there is a constant functional disturbance. His organs are doing work which is not essential to their duties; but they do it with moderate ease, they retain nothing that is detrimental to their structure, and, let alone, they soon regain their natural condition. In the recognition of these simple truths the whole gist of the tobacco controversy is embodied. It is on the presence of the functional disturbance that the vehement opponent of tobacco bases his arguments; it is on the absence of organic mischief that the advocate of tobacco rests his defence.

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## CHAPTER XI.

### PHENOMENA OF DISEASE FROM TOBACCO.

WE have to consider, in detail in this chapter, the functional diseases to which the smoker is subjected as they are presented with more or less of distinctiveness in the blood, in the digestive organs, in the structures of the throat and mouth, in the heart, and in the lungs.

#### *The Blood.*

In the blood, the prolonged inhalation of tobacco produces changes very marked in character. The fluid is made thinner than is natural, and, in extreme cases, paler. In

such instances the deficient colour of the blood is communicated to the body altogether, rendering the external surface yellowish, white and pasty. The blood being thin exudes so freely that a cut surface bleeds for a long time and may continue to bleed inconveniently, even in opposition to remedies. But the most important change is exerted on those little bodies which float in

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myriads in the blood, and are known as the red globules. These globules have, naturally, a double concave surface, and at their edges a perfectly smooth outline. They are very soluble in alkalies and are subject to change of shape and character when the quality of the fluid in which they float is modified in respect to density. The absorption, therefore, of the fumes of tobacco, leads to rapid changes in them. Microscopically examined, they are found to have lost their round shape, to have become oval and irregular at their edges and, instead of having a mutual attraction for each other,—a good sign, within certain limits, of their physical health,—they lie loosely scattered. Indeed, they indicate to the learned observer, as clearly as though they spoke to him, that the man from whom they were taken was physically depressed, and deficient both in muscular and mental power. .

But with all this, it is marvellous to observe how quickly the blood will regain its natural characteristics on removal of the poison. One day of abstinence is often sufficient to permit the poisons to escape and to restore the fluid to its natural condition.

The facts here narrated are derived from the direct observation of the blood of smokers, and I believe they fairly represent the influence of the smoke of tobacco on the blood. But before

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I quit this subject I would point out that the effects produced vary exceedingly, according to the manner in which the tobacco is smoked. If the body is fasting the effects are much more rapidly developed; and this fact is very important, as it accounts for the well-known circumstance that the majority of smokers fail to smoke comfortably on an empty stomach.

Again, the [effects](#) are brought out with far greater intensity when the smoker indulges in a room the air of which is strongly impregnated with the [poisons](#) of tobacco. The reason of this is obvious. Under the circumstances named, the smoker is inhaling over and over again the finely-distributed volatile matters with which the air is charged, while at the same time he is unable to throw off freely the products of his own respiration. Lastly, if a large quantity of fluid be imbibed during prolonged smoking, the changes in the blood are greatly increased, and are made to continue a longer time; for the fluids dilute the blood, and, by dissolving and holding the poisons, render elimination more difficult

#### *The Digestive Organs.*

Although after a time a limited tolerance is set up to the action of tobacco smoke, a certain influence is exerted by it, persistently, on the vital organs of the smoker. On the stomach, tobacco

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produces, even in the most confirmed smokers, marked deviations from the natural condition. Unconsciously, these smokers lose, to a considerable degree, their natural appetite. They feel, as it is said, that the pipe not only takes away hunger but appears to sustain them in the absence of food. This is not mere fancy, for the smoke reduces the activity of all the organs and, therewith, the organic power. The effects on the stomach are twofold, and arise from two distinct poisons. The stomach is lined with a delicate membrane, called mucous membrane, from which the gastric, or digestive secretion is derived, and on the healthy structure of which good digestion depends. Surrounding this mucous membrane the stomach is provided with layers of muscular fibre, which, during the act of digestion, are in rapid motion and bring the food mechanically into contact with the fluid that is to dissolve it. The influence of the smoke extends to both these structures. The bitter extract of which I have already spoken, and which so readily excites vomiting in the young smoker, appears to act at all times, with more or less violence, on the mucous lining. At first it produces great irritation, redness, and injection; after a time the changes are subdued but are not entirely removed. The membrane secretes irregularly, and, as a general rule, does not produce the due

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amount of gastric fluid; hence digestion is impeded. After digestion an acrid fluid is left in the stomach, which irritates and gives rise to heartburn, eructations, frequent nausea with an almost constant sensation of debility of the stomach, and sometimes to cravings for particular foods, especially for those which have an acid reaction, such as pickles and fresh fruits. The muscular portion of the stomach is acted upon by the nicotine. In small quantities, the nicotine excites a slight movement in the muscular fibres not only of the stomach but of the other parts of the alimentary canal, and in moderate smokers it acts as an aperient. Carried to excess, it produces a palsied condition of the muscular fibres, leading to a great increase of debility in the digestive organs, to a serious impairment of their functions and to constipation.

Like the blood, the digestive organs quickly regain their activity on being relieved from their temporary disturbance; for there is no evidence to support the idea that an actual organic change of structure is produced in them. But inasmuch as they are the organs through which the vegetative life of man is sustained, it must be admitted, that so long as they are functionally disturbed, so long the whole of the body, looking to them as it does for the sources of supply, is held, proportionately, in want and exhaustion.

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If, at the same time, waste were not, to a certain extent, prevented, that exhaustion would soon be increased even to danger.

I have already indicated that the bitter extract of tobacco travels along the stem of the pipe, is absorbed directly by the mouth, and is thence carried into the stomach by the act of swallowing. This is also true of nicotine. It is important to bear these facts in mind, as they explain the different degrees of action of different kinds of pipes out of which tobacco is smoked. A long, perfectly clean pipe, composed of a material like clay, which easily absorbs the two bodies specified, may be smoked with partial impunity. It requires a very confirmed smoker to tolerate the black dirty bowl and stem, charged to

the very mouthpiece with the poisonous products, and even in him, in proportion as toleration is borne, digestion is sacrificed. Indeed, I do not believe it possible that any man can constantly smoke a foul pipe without being as constantly a martyr to dyspepsia.

Again, owing to the causes I have named, different kinds of tobacco exert different influences on the smoker. Some tobaccos, such as Cavendish, pigtail, and coarse shag, yield the fluid products in a much greater degree than do Latakia or Turkish. Hence the latter are called mild tobaccos; and although they produce dry-

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ness of the tongue, from the ammonia evolved in their smoke, they do not upset the digestion so materially, nor nauseate so much as the stronger tobaccos, unless they are indiscriminately used. Cigars, if they are "good," produce dyspepsia very quickly, for in smoking them nicotine is more rapidly absorbed.

The symptoms of indigestion that have been narrated, as occurring from the smoking of tobacco, are met with in those who indulge in snuffing, and often in a marked degree. In the snuff-taker, tobacco, in combination with the fluids of the mouth, finds its way into the stomach directly. The enfeebled condition of the organ of digestion, which thereupon follows, is often exceedingly difficult of cure; it is incurable so long as the [habit](#) is sustained, and it even continues for long periods after the habit has been relinquished. The same symptoms follow the practice of chewing tobacco, a practice now happily all but obsolete amongst the better informed members of society.

#### *The Salivary Secretion.*

The effects produced by smoking, on the structures of the mouth and throat, have often been discussed with considerable warmth of argument. The facts presented to us, as guides to a correct conclusion, may be simply stated.

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It will be remembered that along the edge of each lip there is a point where the common external skin, changing its character, becomes red in appearance, smooth and bright. Let the eye be carried from the cheek to the inner surface of the lips and mouth, and the change is at once detected. The difference of these appearances lies in this, that at the commencement of the lips the ordinary skin of the body is slightly transformed in structure. Here too the skin receives a new anatomical name; it is called *mucous membrane*.

The membrane is very much like skin in its anatomical characters, and when washed, so as to be freed from blood, is nearly identical in appearance. It covers the surface of the mouth, and extends through the gullet to the stomach, and so on throughout the whole of the alimentary canal. It may easily be lifted up and removed, or may be torn, abraded or ulcerated. It is well supplied with glands. The ducts or open tubes of those glands which produce the saliva, pass through the mucous membrane into the mouth, while in the back of the mouth and throat there are numerous small glands which constantly supply secretion. At the back of the mouth are the tonsils, and the central structure projecting downwards, called the uvula, and we must not forget in this summary of the parts of the mouth, the gums and the teeth.

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What influence has the smoke of tobacco on the structures named above?

There is excited always in the young smoker an over-action of the glands of the mouth, and especially of the salivary glands. This over-action is felt only during the act of smoking, and in certain persons there is very little over-action even then. But in the large majority of smokers there is set up a copious salivation, leading to expectoration. As the saliva is necessary for the process of digestion, it has been supposed that so to divert it is to destroy, to a considerable extent, the power of digestion. The argument might be true, if men smoked and ate at the same moment; but as this is impossible, and as, in smokers generally, there is an increased rather than a diminished tendency to action of the salivary glands, it is not very easy to see how any loss of saliva can occur from smoking. On the other side, if men [must smoke](#), they are relieved by expectoration; for if they do not expectorate while smoking, the saliva, some of which is swallowed, is made the vehicle for the conveyance into the stomach of those soluble and pernicious substances, the nicotine and the bitter extract.

An evil of a local kind sometimes occurs from the profuse flow of salivary fluid. The saliva contains, in solution, salts of lime, which, existing

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in excess, are liable to be deposited so as to form hard stone-like masses in the ducts of the salivary glands, or to be laid down on the teeth in the calcareous layer which constitutes the crust called tartar. I have seen these results follow smoking many times; but they are not necessary accompaniments, since they may be prevented by strict attention to cleanliness.

#### *Smoker's Sore Throat.*

On the glands of the throat, on the follicles, and the tonsils, an injurious influence is exerted by smoking. There is, in fact, a form of soreness of the throat in smokers, which may be considered as peculiar to them. It consists of an irritable state of the mucous membrane at the back of the throat, redness, dryness and a large soft sore condition of the tonsils which renders the act of swallowing painful. The state thus described is in no way to be considered as permanent when it has been excited, nor as universal amongst smokers, but it is occasionally difficult of cure, and it is far more general than is commonly known. I once examined the throats of fifty smokers of different ages and habits, and found in them the enlargement of tonsil so common, and the other appearances indicated so marked, that I think I could detect an immoderate smoker by these signs alone. It

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often happens that the enlargement of the tonsils exists for a long time without causing inconvenience and a damp, cold, foggy state of the air supervenes; then the evil, becoming exaggerated, is troublesome and painful; enlargement of the tonsils is detected, and the annoyance is markedly increased by any attempt, however brief, to indulge in a pipe. In the fifty cases to which I have referred, thirty-seven had enlargement of tonsil.

In watching the progress of smoker's sore throat, it is observable that the mischief is on the surface of the mucous membrane; it does not extend deeply into the tissues; it does

not give rise to abscess and rarely to ulcer. It exists, usually, as an engorgement with thickening of the mucous membrane and profuse secretive action of the small glands, leading to soreness, to exfoliation, to actual mechanical difficulty in swallowing, and, it may be, to imperfection in speaking and singing. I have known it affect a public singer very seriously, producing a hoarseness and a want of firmness most annoying and painful. I have also known it keep up for a long time a persistent irritative cough. The " smoker's sore throat" is more easily induced by the use of cigars than of pipes. When once it is fully established it is quite incurable so long as the cause that excited it is allowed to

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continue, but it soon disappears when the cigar or the pipe is laid aside.

*The Tongue, Gums, and Teeth.*

The mucous membrane is exposed to another change from immoderate smoking. Its surface may be rendered dry, shining, and raised, and may be made so irritable that when hot or acid foods are taken into the mouth they occasion a considerable degree of sharpness and pain. In extreme instances, the membrane, thickened, pale and leathery, peels off in small roundish patches from the upper surface of the tongue, leaving a red sore structure exposed.

On the gums, smoking produces two effects. It usually causes paleness and an undue firmness and contraction. In rare instances, where from the pressure of decayed teeth the gums are tender, smoking seems to induce vascularity and transudation of blood, with tenderness and swelling: but these are not the pure results of tobacco smoke, they are aided by previous local mischief and often by constitutional taint.

On the teeth, setting aside the accumulation of tartar, I do not think tobacco smoke exerts any injurious influence. Nay, to speak fairly, I believe that the smoke has a tendency to preserve, rather than to destroy these structures. It leaves upon them, truly, a deposit of carbon which stains the

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white enamel black: but by virtue of its antiseptic action this deposit possibly prevents decay.

On all the structures above named, the mucous membrane of the throat, and the mucous lining of the nasal canals, tobacco taken in the form of snuff exerts a prejudicial influence. I have sometimes seen a relaxed and sore throat persistently maintained by the habit of snuff- taking. The [fine particles of tobacco](#) make their way along the nasal tract until they reach the back of the throat, where they keep up a constant irritation.

*Cancer from Smoking.*

Connected with the forms of disease induced by tobacco beyond those . which have been noticed in the present chapter, there is one other important question, viz.:—Does smoking produce cancer?

The first observations that were made on the origin, real or supposed, of cancer, from the use of tobacco, were confined to those forms of the disease in which it appears in the lips. But after a time the assumed danger grew and grew, until it has now become a fixed belief amongst a large section of the public, that cancer, in its general

interpretation as a disease, may be produced by smoking, and that, in a word, the terms "tobacco"

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and "cancer" may be classed together in the order of cause and effect.

It is proper to break through this fallacy. Cancer was present for ages before tobacco was introduced as a luxury.

We find the disease in the inferior animals, in domestic animals, and even in some others which we might imagine would specially be exempt from it. Dr. Crisp actually discovered the disease in the pike.

When to these facts we add this last, that as a whole, cancer is more prevalent in our own community amongst the members of the female sex, who, as a general rule, do not smoke, we require no further proof that tobacco must be entirely separated from cancer as a direct cause of that particular malady.

I move next from the general to the special question. Can the smoke of tobacco excite, locally, in the tongue, or the throat—the disease cancer? The answer to this question, must be indirectly in the affirmative. If, it can, it does it clearly by acting as a substance irritating to the parts with which it comes in contact.

It might be inferred,—theoretically, yet safely,—that in persons of strong cancerous tendency, the irritation produced by the smoke of tobacco would summon into existence the local and much-dreaded mischief. But the truth is, that such occurrences

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are extremely rare, so rare, that I can recall no instance in which cancer, either of the tongue, throat, or cheek, has been connected with smoking. I have seen cancer of the tongue excited by friction against a rough and decayed tooth; I have seen cancer of the throat called forth by the irritation arising from the lodgment of a fishbone; and I have seen cancer form and progress in these parts without any apparent reason; but I have never met with a single instance in which tobacco smoke could be said to have brought out the disease.

If I were inclined to run into an extreme, I might indeed argue, from the facts in my possession, that the effect of tobacco is to stop the local change constituting the visible disease; but this argument would be unfair, because the experience of any one individual is too limited to allow him to speak, dogmatically, upon it. I content myself, therefore, with simply stating the facts that cancer of the mouth may occur and does occur in persons who do not smoke; that it does not occur specially in persons who do smoke; and that any extreme view in reference to tobacco as an exciting cause of cancer of the mouth is without foundation.

There is still one other form of cancerous disease which deserves consideration; I mean cancer of the lower lip. The lower lip is affected,

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not uncommonly, in the predisposed, with a variety of cancer called from its spreading and superficial character "epithelial cancer." It has been observed unquestionably of this cancer that it occurs frequently in persons who smoke short pipes, and that it breaks out at that part of the lower lip upon which the pipe ordinarily presses. Here

therefore we may assume, without hesitation, that smoking excites the cancerous disorder; but this exciting cause is indirect in its action, inasmuch as it is connected with the pipe, and not with the tobacco. It has been found, by experience, that the mischief does not become developed in cigar smokers, nor even in those who smoke pipes which have a smooth surface, are of sufficient length and, as a consequence, are cool; but that the accident occurs from the use of the short cutty pipe, which, held very firmly in the lips without support from the hand, conveys a painful degree of heat.

*The Heart.*

The action of tobacco smoke on the heart has been very differently estimated by different writers. Some have conceived that it exerts no influence whatever, others that it exerts a most dangerous influence. The truth lies in separating functional from organic mischief. I do not think there is any evidence to show that smoking alone is