

are they harmful? *Perhaps—each smoker will*

have to decide for himself whether the satisfaction is worth the risk

So intimately is tobacco bound up with the life of America—from the early Virginia settlements and the plantation economy of the South to the growth of the big tobacco companies and the daily advertising barrage—that any discussion of the health aspects of smoking is bound to excite the hostility of some groups and individuals.

Before the first World War, when cigarettes were much less important in the tobacco business, they were damned principally as a foppish affectation and, on moral grounds, as a kind of symbol of loose living. The indictment now is that cigarettes, healthwise, are the most pernicious member of the tobacco family. The catalog of evils generally associated with smoking them includes irritation of the respiratory tract, eyes, and tongue; interference with appetite; bad breath; pollution of the atmosphere; and many other such. In addition, some doctors insist that smoking, particularly cigarette smoking, leads to addiction, and that addiction impairs the intellect, interferes with judgment, depresses the emotions, inhibits sexual potency, injures the heart and blood vessels, and causes cancer of the lung.

On the other side of the controversy, we find the tobacco industry and its hucksters claiming that smoking will steady the nerves, relieve irritated throats, banish coughs caused by any rival company's tobacco, and promote social ease.

Against this background, it might be a good idea first to clear away some of the misconceptions concerning the effects of tobacco and tobacco ingredients on human beings.

Some misconceptions and some facts

Thomas Edison, like many others distinguished in the arts or sciences, had strong opinions on this subject; he believed that cigarette paper was responsible for many of the toxic symptoms caused by smoking. Subsequent study showed that the part played by paper in the reaction to smoking is insignificant.

Proper moisture content of the tobacco is important for a satisfactory smoke; a moistening agent, such as glycerine or diethylene glycol, is usually employed in the processing of the tobacco. According to Professor H. B. Haag, of the Medical College of Virginia, Richmond:

Discussion, at times somewhat acrimoniously tinged, has waxed concerning the relative merits of these two agents as they affect the irritating properties of cigarette smoke. The more recent studies all are inclined to the view that neither agent shows superiority over the other in this respect.

Tobacco smoke is invariably irritating, irrespective of the type of moistening agent applied.

In addition to nicotine, tobacco smoke contains carbon monoxide, ammonia and other volatile alkaline materials, acids, phenols, aldehydes, and other materials comprising tar.

The heavy smoker inhales a considerable amount of carbon monoxide from the incomplete combustion of tobacco in his cigarette, pipe, or cigar. The carbon monoxide combines readily with the hemoglobin of the red cells and the smoking of two packs could result in saturation of as much as 7% of the hemoglobin with carbon monoxide. But it has not been established that this degree of saturation is responsible for any of the toxic effects of heavy smoking. Nor is there any knowledge about possible long-time effects of this amount of carbon monoxide. Obviously, more research on this problem is needed.

Nicotine: pure and in smoke

Of all the components of tobacco, nicotine has been the focus of greatest interest. The use of denicotinized tobacco and of special tobaccos cultivated for their low nicotine content, are reflections of this special concern with the properties of nicotine. While the toxic effects of pure nicotine in specific doses are well known, there is a considerable difference of opinion concerning the extent to which nicotine of tobacco *smoke* is harmful to health.

In a limited study recently made in the Laboratory of Applied Physiology of Yale University, Drs. Greenburg, Lester, and Haggard found the average nicotine content of the cigarettes they tested to be 17.2 milligrams per gram of dry tobacco. (The average nicotine content of the cigars tested was found to be 17.4 milligrams per gram of dry tobacco.) Since nicotine must be absorbed by the body in order to exercise any effect, the Yale doctors investigated, among other things, the effect of inhaling on the amount of nicotine absorption. They found that a very small amount is absorbed when a cigarette or cigar is smoked without inhaling (other studies have shown that if the smoker does not inhale, but does hold the smoke in his mouth even for a few seconds before expelling it, the nicotine absorption is much higher). But with inhalation, virtually all of the nicotine present in the smoke is retained by the body. In sum, they found that when cigarette smoke is inhaled, about two and a half milligrams of nicotine is retained in the body (see page 68 for CU's findings on the amount of nicotine in cigarette smoke). Inhaling is much more common among cigarette smokers than among cigar and pipe smokers. Whatever the reason, it is apparent that, in general, for the same quantities of tobacco, inhaling cigarette smokers absorb considerably more nicotine than non-inhaling cigar and pipe smokers—or non-inhaling cigarette smokers.

According to one investigator, there is no relation between the so-called "strength" of tobacco and its nicotine content. The strength of a tobacco depends primarily on

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