

*What can and what must be done to deal with the smoking disease? Sir George Godber provides an answer on the basis of currently available knowledge. The answer involves action by government, education to change attitudes and opinions, as well as other measures to reduce the number of cigarettes sold and smoked.*

## **SMOKING DISEASE: A SELF-INFLICTED INJURY**

*Sir George E. Godber, M.D., Hon. F.A.P.H.A.*

IT is a great privilege to carry out a task entrusted to me in honor of Dr. Harold Diehl, whom I first knew 20 years ago as dean of medical sciences and professor of public health at the University of Minnesota. Since his retirement 11 years ago I have been deeply interested in his work for the American Cancer Society and especially on smoking and health. This year his book "Tobacco and Your Health" has been published and has provided all of us concerned with this desperately urgent health problem with the most comprehensive account yet available. What I have to say on the same subject must suffer in comparison with his full and lucid exposition.

### **Mounting Evidence**

The subtitle of Dr. Diehl's book is "The Smoking Controversy," and attention should be called to the way in which the nature of that controversy has changed in the last 20 years. The story really begins with Wynder and Graham in 1950 and Doll and Bradford-Hill in 1952. At that time, the association of cigarette smoking with cancer of the lung was firmly demonstrated. Since then, an enormous volume of evidence has accumulated which has long since

put beyond reasonable doubt the direct causal relationship between cigarette smoking and lung cancer. Epidemiological studies on the most extensive scale have confirmed in every respect the association then demonstrated. There is no need to repeat it all; it is enough to say that no valid evidence against the thesis has been put forward, despite the manifest interest of many individuals and large commercial undertakings to cast doubt upon the claim, if this could be reasonably done. The epidemiological picture is convincing in itself. From the early years of this century, the use of manufactured cigarettes has become general, at least in what are called in other contexts the developed countries, and has progressively increased in amount. Given a causal agent to which a long period of exposure is required, the epidemic of lung cancer—that began in men in the 1930s—has developed as might be expected. A comparable phenomenon is now in progress in women who started their use of cigarettes, many years later, and have not yet reached the same level of consumption as men. We are not yet at the top of the curve in Britain or in the United States and, unless some radical change occurs in the smoking habits of men, it will be many years yet before the end

to the increase in deaths. During that period, deaths among women may be expected to increase proportionately faster than among men. In the last ten years, the crude death rate from cancer of the lung among men in Britain has increased by more than one-quarter and among women by nearly three-fifths.

It has been shown that the condition of the bronchi of heavy smokers show histological changes such as might be expected from exposure to an irritant which can go on to produce malignant change. We know that the distillates from cigarette tar contain carcinogens that can produce malignant change when applied to the skin of mice. Similar changes can be produced in the respiratory system of animals exposed to cigarette smoke, even though they cannot experience the length of exposure to which longer-living man commits himself voluntarily. The only factor lacking is the unimaginable controlled experiment when matched groups of human beings are prospectively exposed or not exposed to cigarette smoke. Surely, the volume of the accumulated evidence of the results of voluntary exposure, and now the benefits of voluntary withdrawal, are sufficient to justify the statement that we no longer need to study whether cigarette smoking causes lung cancer, but only how. British doctors reduced their cigarette smoking by half and their death rate from lung cancer by one-third while other British men were smoking more and their death rate increased by one-quarter.

A series of authoritative reports from the Royal College of Physicians of London and from committees set up by the Surgeon General in this country have demonstrated, during the last decade, the even greater mortality from other causes than lung cancer attributable to cigarette smoking. Denmark, Canada, Norway, and the Netherlands—to name only four countries—have their own reports. As might be expected, cancer of

the larynx and esophagus are substantially more frequent in cigarette smokers of middle age than in nonsmokers. To a lesser extent, the same is true of cancers of the pancreas, liver and biliary passages, and urinary bladder. The disparity between cigarette smokers and nonsmokers is not so great for these other sites, but for the lung at least 90 per cent of cancers are attributable to smoking. Even pipe and cigar smokers have rates twice as high as nonsmokers; for cancer of the buccal cavity, esophagus, and larynx the disadvantage is even greater. There have been many attempts to suggest other causes for the increase in lung cancer in the last 40 years, especially atmospheric pollution and fumes from internal combustion engines. Whatever part other factors may play, it is again the cigarette smokers who suffer and if the other contaminants contribute, it is only as adjuvants to the real danger—cigarette smoke. Even asbestos workers and uranium miners, who have exceptionally high rates, only show this great disparity if they are also smokers.

Finally, the degree of risk is demonstrably associated with the quantity smoked and the duration of exposure. It is probably also associated with such factors as inhalation and smoking to a short butt, so that all the potentially damaging constituents are volatilized and inhaled. Perhaps the conclusive point in this epidemiological picture is that the curve of incidence rapidly rises with age in the smoker and also rises in the nonsmoker, but much more slowly. If the smoker desists, the risk he experiences no longer rises with age. Indeed, it remains almost stationary to the point where many years later he experiences no more than the risk of the nonsmoker at the same age.

The epidemiology of the smoking disease, as evinced in lung cancer, runs parallel with that of other manifestations in cardiovascular and respiratory disease. Chronic bronchitis is known to

many as the English disease. Even allowing for a difference in terminology, it is certainly more prevalent than in this country or in Scandinavia where similar studies have been done. Deaths registered to bronchitis are nearly as numerous in Britain as to cancer of the lung. Moreover, many of the deaths attributable to pneumonia or to heart disease may be associated with chronic bronchitis. Emphysema, as recorded in this country, is probably often described on certificates as bronchitis in Britain. At least half of these deaths are attributable to cigarette smoking and a substantial number of deaths certified as due to heart diseases; particularly ischemic heart disease at younger ages are also attributable to cigarette smoking. There is evidence that men aged from 40 to 49 who smoke cigarettes heavily have an almost fourfold mortality from coronary disease, compared to nonsmokers. Studies in the last few years have attempted to identify the proportion of deaths from a variety of conditions attributable to the smoking disease, and estimates in this country have been as high as 300,000 deaths. The number in Britain certainly exceeds 50,000 a year. It is doubtful whether we gain much by attempting greater precision in this, but it is perhaps sufficient to say that at least one-tenth of all deaths each year in Britain now, occurred in that year because of the smoking disease. Lung cancer, bronchitis and emphysema, and coronary atherosclerosis occur as well in nonsmokers and the frequency increases with age. The important point about cigarette smoking is that it accelerates the onset as well as increasing the incidence. It cripples and kills at a much earlier age than need otherwise occur.

It is obvious that the lesions that produce such a number of deaths have also produced disability preceding death. In Britain, bronchitis is given as the certified cause of one-tenth of all "sickness absence" from work in an average

year. The 1967 report on Smoking and Health by the US Public Health Service gave more detailed evidence of the amount of disability among cigarette smokers and nonsmokers, and showed that cigarette smokers suffered about one-fifth more sickness absence than nonsmokers. Again, the cigarette smoker was at far greater disadvantage than the smoker of pipes and cigars. The findings on respiratory disease are perhaps hardly surprising. The irritant effects of inhaled tobacco smoke are well enough known and the "smoker's cough" is the obvious disability which everyone recognizes in the heavy smoker. Studies in Britain have even shown that the incidence of cough and phlegm in school-boys who smoke is greater than in those who do not. Even the association with cardiovascular disease is not entirely surprising, since such conditions as Buerger's disease had been linked with smoking long before the facts on lung cancer emerged. Moreover, an increase in mortality from coronary disease in younger men has been noted parallel with the increase in lung cancer. It has now been shown that the extent of atheromatous change in the aorta is related to cigarette smoking and to the amount smoked. Cardiovascular disease and respiratory disease (beside lung cancer) are common from other causes than smoking. We all die eventually from something, and cardiovascular disease is the most common cause. But chronic bronchitis, with its long history of steadily increasing disability, and coronary disease in middle age are more serious factors in the loss of working life than cancer of the lung.

The fatal outcome of the smoking disease thus comes in a variety of ways, and some of them are common to smokers and nonsmokers alike. The argument of many smokers is that they must die of some cause anyway, but the measure of the loss of life is not simply the 50,000 or so incidents of deaths at all ages, at-

tributable to smoking; it is in the lost years of active life. At least 150,000 years are lost in Britain annually, as a result of death before the age of 65. If our loss of working time from sickness is in the same proportion as that of the United States—and it might well be higher—at least another 200,000 years of working life are lost each year through certified “sickness absence.”

There was a time in Britain when nearly 100,000 man years were lost annually through disability from tuberculosis and there were 25,000 deaths, most of them at an earlier age than those due to smoking. That loss has been reduced by nine-tenths, and it is a grim reflection that the cigarette in that same time has undone one of the medical triumphs of this century.

This is the bill which society now meets each year. It is compounded of a vast number of self-inflicted injuries, the consequences of which manifest themselves in the susceptible in many different ways. As our information becomes more exact, we identify more precisely both mortality and morbidity under the major groupings already mentioned. We do not measure the smaller limitation of respiratory function, which can be shown to follow smoking of any cigarette, nor the possible contribution this may make to other failures. For instance it has been shown that the driver of a car through heavy traffic in London streets takes in and holds as carboxyhemoglobin far more carbon monoxide from the cigarette he smokes than from the collective pollution of the exhaust fumes of his own and other vehicles. If this seems like a cold-blooded economic analysis, there is much more to be said of the human misery which accompanies these facts. Cancer, cardiovascular disease, declining respiratory function, and acute exacerbation of respiratory disease are our main executioners at later ages. Dr. Stamler's paper on cigarette smoking and atherosclerotic

heart disease and the review in Part II of the June, 1969, issue of this Association's journal strikingly reveal the cigarette smoker's self-imposition of earlier onset of these aspects of aging and of risk of death from these causes. There can be other contributory factors—atmospheric pollution, obesity, physical inactivity, exposure to asbestos or uranium, but each one is potentiated and magnified by the use of the cigarette. The commonest pictorial advertisements of cigarettes portray their supposed contribution to youthful good living or outdoor virility. They are a macabre inversion of the truth; the cigarette is a direct contribution to disability and earlier death. As the late Senator Robert Kennedy said of that familiar advertising comment by the rider, against a wonderful scenic background as he lights a cigarette, “He should have said this is emphysema country.” That indeed is the true message!

### Positive Action Needed

In the last century and the earlier part of this one, the great contribution to human health was made by preventive rather than by curative medicine, as McKeown has well shown. In the last 20 years, active immunization has greatly reduced morbidity and mortality from a large group of infectious diseases. Effective drugs for the treatment of other diseases, notably tuberculosis, have both reduced morbidity and mortality and the spread of the infections themselves. These gains have been secured by action against harmful elements in the environment or by relatively simple, single procedures for which the individual's acquiescence was easily obtained. Our present problem is totally different, for it involves the modification of an almost general pattern of behavior which not only gives individual gratification, but forms part of ordinary social intercourse for a majority of adults. There is nothing else quite like

it, since the use of alcohol is harmful only in excess and overeating applies to a minority of individuals. Actually, there are only two ways to prevent the injurious effects of cigarette smoking: (1) the abolition of the cigarette, or (2) the production of a relatively innocuous form. We know that the first of these courses would be effective; we do not even know if the second is practicable, and it would be many years before we could know if any measure of this kind had been successful.

Undoubtedly, the greatest single contribution to the promotion of health in this country, in Britain, and in many other countries, would be the total abolition of cigarette smoking. No other single factor could offer an increase of four years in the expectation of life for cigarette-smoking young males, or remove the causal factor in at least one-tenth of the annual deaths and one-fifth of the working time lost by the general population through sickness. If we were campaigning against some injurious factor in the environment such as excessive exposure to asbestos dust, we would unhesitatingly aim at its total removal if possible. One need only recall the recent reaction here and in Europe to the discovery of bladder cancer in a tiny number of rats that had been heavily dosed with cyclamates. The reason, perhaps, is reflected in the Norwegian report, "Influencing Smoking Behaviour" which includes the sentence: "Data are also scarce on what motivates certain individuals to reject smoking altogether, even if this group of persons in our present society must be considered to be an interesting group of deviates." Nearly four-fifths of the doctors in this country and seven-tenths of the doctors in Britain are such deviates, at least so far as cigarettes are concerned. Many others are converts and every year many others, not of our profession, are also converted; in Britain, there is already evidence that the well-to-do smoke less and suffer less

from smoking diseases. Nevertheless, the successes we have achieved against smoking diseases are pitifully small. As a result of the efforts of the last six years, perhaps a million fewer people are smoking in Britain. Due to a better coordinated effort in this country, the gain has been greater but not yet enough to check the rise in mortality and morbidity. According to Dr. Horn, you have actually reduced both total cigarettes smoked and cigarettes per adult.

A study by the British Social Survey, recently published, shows that boys who start smoking usually know of the association with lung cancer and half of them want to stop. But group pressures and an acquired taste are too strong. There is the desire to be seen by one's peers as tough, precocious, and unmindful of conventional achievements. The subversive message is there in the pattern of the adult world, and it will remain so until the truth is presented at least as often as the false. The message from the nonsmokers that smoking is damaging now and dangerous later must go out from every authoritative source, no longer in a still, small voice. In no field of preventive medicine is the case clearer; however, we are not dealing with the managing authorities on such a preventive exercise as the fluoridation of water, but with many millions of individuals. We doctors convince ourselves and perhaps our social contacts, but not the world at large.

To my mind we cannot hope for a major success against cigarette smoking, so long as it is constantly presented to the public as a desirable activity, and presented with the skill and persuasiveness that commercial advertising well understands. The Norwegian report, previously cited, contrasts the pitifully small amount of exposure the individual can receive to arguments against smoking compared with the enormous amount of persuasion in the opposite camp. This is done not only through effective com-

mercial advertising, but much more through the personal example of so many others in the social group and of presentation in films, television, and even literature. Investigation of English school children suggested that in taking up smoking they sought to improve their own self-image. In Britain, at least, a great part of the advertising of cigarettes presents young people in situations that imply social advantage to the smoker. The influence of parents, teachers, and younger people in the public eye is known to be powerful, and certainly the children from smoking households are more likely to start than others. We cannot hope to break into this vicious circle until the image of the cigarette smoker is somehow changed. We may make slow and painful headway, but we are trying to change attitudes against a background of behavior in quite the contrary sense. The almost automatic publicity for any suggestion that cigarette smoking might, after all, not be as harmful as we know it is, shows only too clearly how the public wants to react.

### The Norwegian Report

The clearinghouse on Smoking and Health in the US Public Health Service and the InterAgency Council on Smoking and Health have demonstrated most clearly the advantage that strong positive action can bring. There seems to be more progress here, although you started later, than in Britain, yet I believe that more must be done. The Norwegian report, which gives an admirably balanced review of the needs and possibilities, reaches the conclusion that there must be an educational program for school children and young people, physicians and other health personnel, teachers, youth leaders, and parents of children of compulsory school age. That is a tremendous undertaking. The need for it is underlined by an investigation

of the smoking habits of students in Britain which revealed that medical students, who should surely be most susceptible to the message, actually smoked more in the later years of their training than earlier—a strong reminder that it should be the duty of teachers in our medical schools to emphasize this lesson to their students.

In Britain, only the Royal College of Physicians has really been active, and I wish that the recommendations of the American College of Physicians last year had been paralleled by similar action by professional organizations in Britain. Several months ago, the European Committee of WHO asked its members to refrain from smoking at meetings and recently the Regional Committee of the Americas did the same. Ten years ago, the British Medical Journal ceased to accept tobacco advertisements, as also annual meetings of the Association exclude smoking. Two years ago, the BBC's paper, "The Listener," decided to refuse cigarette advertisements and the Independent Television Authority had earlier excluded all TV advertising of cigarettes. Now the *New York Times* has announced it will refuse cigarette advertising unless it is accompanied by a statement of the risks involved. We desperately need other support such as the Federal Communications Commission gave here.

The Norwegian report also recommended restriction on advertising, labeling of cigarette packages, the control of the size of cigarettes and physical changes, and particularly emphasized the need for restriction against smoking in public transport so that priority should be given to the convenience of the non-smoker. Rightly, they did not advocate strong restrictive action against smokers. There are restrictions in Scandinavia and in Britain on television advertising and an agreement has been announced here for its reduction. In Italy, advertising has also been re-

stricted. In Britain, promotion by the use of gift coupons promptly filled the gap left by television advertising and an attempt to control cigarette advertising voluntarily has failed. Perhaps the strong resistance against a requirement to incorporate a warning of the health hazard in any cigarette advertising shows what might be the most effective method of driving the message home. That is a matter for governments, but the technique of making the opposition carry its own warning is a well-known instrument of propaganda. Public Health Notes in June, 1969, reviewed various methods of "smoking cessation" without finding much encouragement.

The Norwegian report reviews the work of tobacco-weaning clinics and courses, and suggests their continuance and wider use not because of their striking success, but because any success may be cumulative in its effect. A later report also from Norway records a small favorable result from a disproportionately great effort. Our experience in Britain has not been wholly favorable, but it is true that we may have been too much influenced by the immediate result. Certainly this is a subject worthy of closer study. McKennell's work in Britain suggests that those who do not want to stop are often just the people who could, and vice versa.

### Summary

We cannot hope to eliminate smoking in the short run, but we could perhaps hope to do more by persuading people that cigars and pipes are safer than cigarettes. The Norwegian review does not favor this, but it was published before the evidence assembled in the Surgeon General's report. We certainly know now that smokers of cigars or pipes are far less severely affected than smokers of cigarettes. We have less clear evidence that conversion from cigarette to pipe or cigar reduces the risk to the

extent complete abandonment of smoking would, but it is a good working hypothesis that it would help. It is reasonable to urge such action not only because the expectation of reduction of the hazard seems sound on general grounds, but also because any reduction of cigarette smoking among those who have the habit now must reduce the influence on younger people in favor of the cigarette. Unless and until a safe cigarette can be found, any measure which reduces the number of cigarettes sold and smoked must be welcomed in the public interest.

There is already evidence that reduction of the tar content is of value, and confirmation that reduction of the nicotine content does not lead to the smoking of more cigarettes. Both these matters need further study, but there no longer seems justification to hold back from endorsement actions to reduce both tar and nicotine. There is also some prospect of a tobacco substitute that would produce far less tar and irritant and in which the nicotine could be adjusted. If this becomes a practical possibility, there would be presumptive ground for adopting it, though obviously proof is still lacking.

The Norwegian Committee concluded that it would not "express great hopes with regard to the effect of the various measures, separately or in combinations. The implicit smoking-positive influence taking place in connection with use of tobacco is strong and persistent. The problems that many smokers have in giving up smoking are such that they leave no reason for exaggerated optimism. Still the committee is of the opinion that the recommended measures if implemented will have positive effects."

That was written two years ago. The key to it seems to be in the second sentence. We have somehow to reduce "the implicit smoking positive influence." We can contribute toward that end through educational programs, and

we need more research on motivation and method. Restrictive measures can only be taken by a government. We have still something to offer on the therapeutic side. Indeed, we have made some impact already. It is possible to induce a general change in public opinion. Whatever the obstacles, surely we cannot fail to pursue that objective. In his book, Dr. Diehl has put together the most comprehensive and cogently argued case yet

published. These comments have done no more than extract some of that lesson, and those who have not yet perused it are urged to do so.

Of course, reason *will* triumph in the end as it will in securing fluoridation of water; the cigarette, as we know it, is doomed. But every year that culmination is delayed costs mankind years of useful and enjoyable life that must be counted in millions.

Sir George Godber is Chief Medical Officer, Department of Health and Social Security, British Ministry of Health, Alexander Fleming House (Elephant and Castle), London S.E.1.

This paper was presented as the Harold S. Diehl Lecture, jointly sponsored by the American Cancer Society, the Public Health Cancer Association of America, and the American Public Health Association at a General Session at the Ninety-Seventh Annual Meeting in Philadelphia, Pa., November 11, 1969.

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## A Whole Town Quit Smoking!

In Greenfield, Iowa, the entire community quit smoking for 30 days. This happened after the 2,200-resident town was chosen as the site of a movie, "Cold Turkey," about a place whose citizens decide to kick the smoking habit en masse. United Artists, producers of the film, offered the town \$6,000 if Greenfieldians would sign pledges to stop smoking for four weeks. They did—and then burned hundreds of cartons of cigarettes in the town square. (Medical Bulletin on Tobacco, Fall, 1969; Room 1410, 1740 Broadway, New York, N. Y. 10019)