

'A COUNTER-BLASTE TO TOBACCO' (1604 - 1962)

A REVIEW OF THE REPORT BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON ON *SMOKING AND HEALTH*, WITH SPECIAL REFERENCE TO SOUTH AFRICAN PROBLEMS

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*'Have you not reason then to bee ashamed, and to forbear this filthie noveltie, so basely grounded, so foolishly received and so grossely mistaken in the right use thereof? In your abuse thereof sinning against God, harming yourselves both in persons and goods, and taking also thereby the markes and notes of vanitie upon you: by the custome thereof making your selves to be wondered at by all forraine civil Nations, and by all strangers that come among you, to be scorned and contemned. A custome lothsome to the eye, hateful to the Nose, harmefull to the braine, dangerous to the Lungs, and the blacke stinking fume thereof, neerest resembling the horrible Stigian smoke of the pit that is bottomelesse.'*¹

In these unequivocal terms, King James I of England in 1604 concluded his monograph entitled *A Counter-Blaste to Tobacco*.¹ King James was a sincere believer in the Divine Right of Kings, but he was prepared to accept the responsibilities as well as the privileges of his royal office. With his responsibilities in mind, he published several treatises aimed at improving the public morals and the public health, and in one of the first of these he drew the attention of his subjects to the evils of tobacco smoking. Unhappily, King James's warnings were ignored and the habit of smoking tobacco has disastrously been increasing ever since. In 1602, 16,128 lb. of tobacco entered the Port of London; by 1957, 238,950,487 lb. of tobacco were being retailed in Britain per year for local consumption.² With the rising consumption of tobacco there has been a rising incidence of certain diseases associated with smoking, and, of these, the increase in the death rate from squamous carcinoma of the bronchus has been most startling.

During the last decade, several responsible individuals and organizations have warned of the probable dangers of tobacco smoking, but as in the days of King James I, these have been practically ignored.³⁻⁶ Then, in 1959, the Royal College of Physicians of London appointed a Committee 'to report on the question of smoking and atmospheric pollution in relation to carcinoma of the lung and other diseases'. The President of the College, Sir Robert Platt, headed the Committee, which included Sir Aubrey Lewis and Drs. J. G. Scadding, R. Bodley Scott, F. Avery-Jones, N. C. Oswald, C. M. Fletcher, J. N. Morris and J. A. Scott. The membership of the Committee, representative of the best in British medicine, assured that the inquiry would be searching and that the conclusions would command respect.

In March 1962 the Committee published their report in the form of a very readable, soft-covered booklet of 70 pages, entitled *Smoking and Health*.⁷ In it, a mass of information is carefully but concisely analysed and some of the more important data are presented graphically in a series of beautifully clear text figures and tables. The conclusions are stated, as King James stated his, without equivocation:

'The most reasonable conclusions from all the evidence on the association between smoking and disease are: that cigarette smoking is the most likely cause of the recent world-wide increase in deaths from lung cancer, the death rate from which is at present higher in Britain than in any other country in the world; that it is an important predisposing cause of the development of chronic bronchitis, in the absence of which morbidity and mortality from this common disease would be substantially reduced; and that it may be partly responsible for the persistent tuberculous morbidity and mortality in elderly men.'

'Cigarette smoking probably increases the risk of dying from coronary heart disease, particularly in early middle age. Smoking of any kind may increase symptoms due to arterial disease of the heart or limbs and possibly promotes its development and progression.'

'It does not appear that smoking causes gastric or duodenal ulceration but there is clear evidence that it has an adverse effect on healing of these ulcers.'

To judge from comments in the British Parliament⁸ and press,⁹ the Royal College of Physicians' report has made more of an impact than any of its predecessors from King James I onwards, and there are indications that some of its suggestions may soon be implemented. For these reasons alone, it deserves to be read by all responsible medical and lay persons.

The R.C.P. report discusses the more or less well-established associations of cigarette smoking with chronic bronchitis, pulmonary tuberculosis, ischaemic heart disease, peripheral arterial disease, delayed healing of peptic ulcers, cancer of the mouth, throat and oesophagus, accident-proneness, tobacco amblyopia, and cancer of the genito-urinary tract; the possibility of pregnant women who smoke giving birth to under-weight babies is also considered. The most intensive study, however, has been directed at the causal relationship of cigarette smoking and lung cancer, and the present review will be limited to this aspect of the report. The R.C.P. committee was primarily concerned with the situation in Britain, but many of its findings have universal application. In this review, the British report will be considered with particular reference to South African problems of 'smoking and health'.

THE PROBLEM STATED

Since the first world war, there has been a rapidly progressive increase in the number of deaths from lung cancer. In the early years of this century, lung cancer was rarely diagnosed; now, in several countries including South Africa, it is one of

TABLE I. AVERAGE ANNUAL NUMBER OF LUNG CANCER DEATHS, DURING 5-YEAR PERIODS, IN MEN AGED 45-64 YEARS (ENGLAND AND WALES)⁷

Period	Lung cancer deaths per year
1916-20	146
1926-30	481
1936-40	2,020
1946-50	5,031
1956-59*	9,108

* 1960 data not yet available.

the commonest causes of cancer in men. Table I (abstracted from the R.C.P. report) shows the rising incidence, in England and Wales, of lung cancer deaths in men aged 45-64 years. This is the age group in which men in England and Wales are most susceptible to lung cancer; it is also the age group in which family and professional responsibilities are at their highest.

In this country, the Bureau of Census and Statistics groups together all deaths from tracheal, bronchial and pleural cancer, so that a direct comparison of English and South African data cannot readily be made. Fortunately, Dr. Geoffrey Dean, of Port Elizabeth, has performed a valuable service by analysing the relevant death certificates for the period 1947-1956 and extracting those dealing with bronchogenic carcinoma.¹⁰ When compared with the available data for 'lung cancer', Dean's figures show that the true incidence of strictly 'bronchogenic carcinoma' is a little lower; but the difference is slight, and in further discussion the crude 'lung cancer' figure will be used. The South African data are presented in

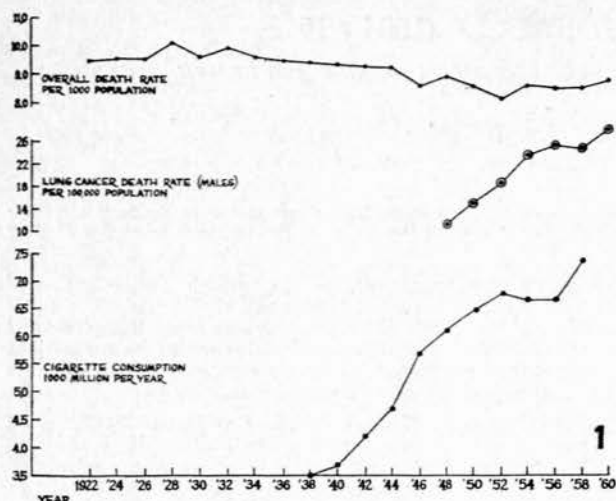


Fig. 1. Total death rate, male lung cancer death rate and the annual cigarette consumption for White South Africans. (Data from the South African Bureau of Census and Statistics and from The Tobacco Manufacturers' Standing Committee.)

Table II and in Fig. 1, where it will be seen that in the decade from 1950-1960 the death rate from lung cancer in White South African men has almost doubled.

TABLE II. LUNG CANCER DEATHS IN WHITE SOUTH AFRICAN MEN*

Year	Total deaths	Lung cancer deaths**	Lung cancer death rates per 100,000 living men
1950	12,878	199 (193)	15.2
1951	13,360	260 (246)	19.6
1952	12,853	256 (250)	19.0
1953	13,589	288 (278)	20.9
1954	14,047	336 (333)	24.0
1955	13,373	333 (329)	23.3
1956	14,493	376 (357)	25.9
1957	14,487	366	24.8
1958	14,842	379	25.2
1959	15,334	409	27.2
1960	15,389	433	28.3

* Data supplied by the South African Bureau of Census and Statistics, Pretoria.

** The figures in parenthesis are the number of strictly bronchogenic carcinoma cases, enumerated by Dean,¹⁰ i.e. cases of tracheal and pleural cancers are excluded.

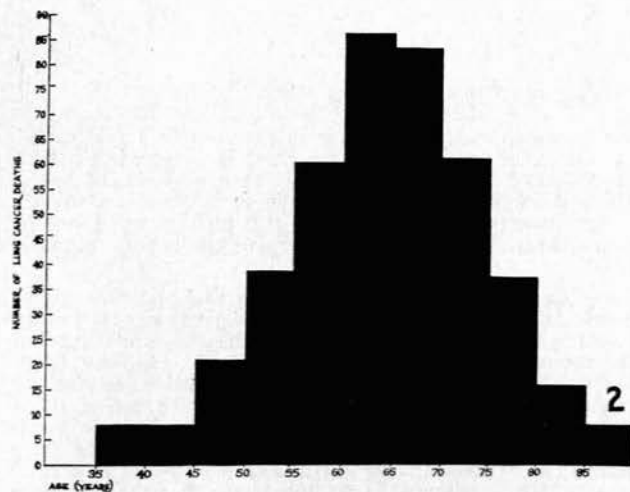


Fig. 2. Age distribution of lung cancer deaths in White South African men in 1960. (Data from the South African Bureau of Census and Statistics.)

Fig. 2 shows the age distribution of the 433 lung cancer deaths which occurred in White South African men in 1960. The peak incidence in this country is about 5 years later than in England.

THE CASE AGAINST CIGARETTE SMOKING

The rising incidence of lung cancer has been accompanied everywhere by a parallel increase in cigarette smoking. In 1937, in South Africa, 3,336,000,000 cigarettes were consumed by the White population; since then there has been an almost linear increase and by 1957 it had reached a total of 7,483,000,000 cigarettes per year (Fig. 1).¹¹ But cigarettes are only one of many commodities of which the consumption has recently increased: the use of petrol, cosmetics, polyethylene polymers, sedatives and many other products has also increased in this atomic era, so why are cigarettes specially chosen for castigation? The answer lies in the highly specific nature of the association of cigarette smoking with lung cancer. If this association is to be accepted as a causal one, three criteria must be satisfied, viz:

1. The victims of lung cancer must include more cigarette smokers than the rest of the community.
2. Smokers must be more prone to develop lung cancer than non-smokers.
3. A specific carcinogenic effect of tobacco smoking must be demonstrable by experimental and pathological studies.

Each of these criteria will now be considered in turn.

Retrospective Studies

It is common clinical experience that lung cancer—in particular squamous carcinoma of the bronchus—is extremely rare in non-smokers. This clinical impression is now amply confirmed by numerous epidemiological studies throughout the world. The R.C.P. report refers to 'at least 23 investigations in 9 countries (which) have shown by retrospective study that among sufferers from lung cancer there is a higher proportion of heavy smokers and a lower proportion of light smokers or non-smokers than in comparable groups'. An early example of one of these studies is presented in Table III.

TABLE III. SMOKING HABITS OF MEN WITH AND WITHOUT LUNG CANCER¹²

Average daily cigarette consumption for 20 years	Percentage of lung cancer cases	Percentage of control cases*
Nil	1.3	14.6
Less than 10	2.3	11.5
10-15	10.1	19.0
16-20	35.2	35.6
21-34	30.9	11.5
35 or more	20.3	7.6

* The age groups of the control cases have been weighted to make them comparable with the lung cancer groups.

The data for this Table have been extracted from a report by Wynder and Graham¹² from St. Louis, Mo., USA, who compared the smoking habits of 605 men with squamous or undifferentiated lung cancers with the smoking habits of 780 men admitted to hospital with other diseases. It will be seen that very few of the lung cancer patients were non-smokers and that 51% of them smoked more than 20 cigarettes daily; on the other hand, 15% of the control patients were non-smokers, and only 19% of them smoked more than 20 cigarettes per day.

Prospective Studies

Prospective studies have been carried out in Britain, the USA (2 series), and in Canada. In each investigation, smokers were shown to be far more liable to develop lung cancer than non-smokers; each study also showed that among the smokers, the greater the indulgence in the cigarette habit, the greater was the likelihood of lung cancer developing. Thus, this more elaborate type of epidemiological survey has fully substantiated and complemented the results of the retrospective studies.

Of the 4 prospective surveys which have been published, medical men will perhaps be most interested in the study of the smoking habits of their British colleagues, conducted by Doll and Hill.¹³ In October 1951 these investigators addressed personal questionnaires concerning smoking habits to all members of the medical profession in the United Kingdom. More than 40,000 doctors replied. Between November 1951 and March 1956 it was ascertained that 1,714 deaths had occurred among those doctors over the age of 35 years who had answered the questionnaire, and that 84 of these deaths were due to lung cancer. A direct relationship was found between the number of cigarettes smoked and the subsequent development of lung cancer. The lung cancer death rate in heavy smokers (more than 25 cigarettes daily) was 20 times that in non-smokers. Pipe smokers had a much lower death rate

TABLE IV. LUNG CANCER IN RELATION TO SMOKING HABITS AMONG BRITISH DOCTORS¹³

Smoking habits	Age-standardized death rate from lung cancer per 1,000 doctors
Non-smokers	0.07
Pipe smokers	0.38
Cigarette smokers:	
1-14 per day	0.47
15-24 per day	0.86
25 or more per day	1.66

than cigarette smokers. Table IV summarizes some of the findings in this survey.

In a further communication to the R.C.P. Committee, Doll and Hill provided an estimate of the percentage of men aged 35 who may expect to die (from any cause) before the age of 65 years. 15% of non-smokers would die before the age of 65; 22% of those smoking 1-14 per day and 25% of those smoking 15-24 per day would die in this period, while 33% of men smoking over 25 cigarettes a day would not see their 66th year.

In one of the American studies, Hammond and Horn¹⁴ reported on 187,783 men whose smoking histories had been obtained by interview. These men were followed-up for an average period of 44 months each, during which time 295 died from proved bronchogenic carcinoma. Again the death rate from this disease was directly proportional to the number of cigarettes smoked; in those habitually smoking more than 40 per day, the death rate was 64 times as great as in the non-smokers!

A matter of some interest arises out of a comparison of the British and American experience. Although the cigarette consumption per person in Britain is somewhat less than that in the USA, the death rate from lung cancer is greater among Britons than among Americans. One possible explanation for this may be found in the different smoking habits of Britons and Americans: in Britain (where cigarettes are relatively expensive), as much of the cigarette as possible is smoked and a relatively small butt is discarded, whereas, in America, it is customary to discard a far larger unsmoked butt. Hilding¹⁵ reported that the average cigarette butt left in an American hospital dining room measured 36.3 mm.; in England, Kennaway¹⁶ found that the average length of the butts was 15 mm. Thus more tobacco is consumed per cigarette in England and less filtration is provided for the tobacco smoke.

Carcinogenic Activity of Tobacco Smoke

A number of investigators have produced skin cancers in mice and rabbits by the repeated application of tar condensed from tobacco smoke.¹⁷ It has not been possible, however, to produce lung cancer in experimental animals by exposing them to tobacco smoke itself.¹⁵ This does not exonerate tobacco smoke as a cause of human lung cancer: the experimental production of lung cancer with non-radioactive substances is notoriously difficult, and investigators have failed to produce such neoplasms in animals even with the well-known industrial lung carcinogens such as nickel, chromates, asbestos and inorganic arsenic.

On the other hand, Auerbach and his colleagues¹⁸ have

recently produced evidence from postmortem studies which strongly suggests a carcinogenic effect of tobacco smoking. These workers examined multiple sections of the respiratory tract in smokers and non-smokers in those dying from lung cancer and other causes. They found that the incidence of histological changes in the bronchial mucosa, which are potentially precancerous (basal-cell hyperplasia, squamous metaplasia and carcinoma-in-situ), was directly proportional to the number of cigarettes smoked and was particularly high in those dying from lung cancer (all of whom were cigarette smokers). This is the nearest approach which can be expected to a direct demonstration of the carcinogenic effect of cigarette smoking on the bronchial mucosa in man.

Much stress has been laid by the defenders of the smoking habit on the failure to demonstrate specific bronchial carcinogenic substances in tobacco smoke. The R.C.P. report makes light of this objection: it draws an analogy with the great sanitary movement which more than a hundred years ago began to bring cholera and typhoid under control long before the specific causative micro-organisms were identified. Many thousands of lives would have been lost had the initiation of public sanitation been delayed until *Salmonella typhi* and *Vibrio cholera* were isolated and minutely characterized.

OTHER POSSIBLE CULPRITS

The R.C.P. committee considered various other alternatives before concluding that cigarette smoking was the most important cause of lung cancer. Of these, heredity as a cause for lung cancer and the question of general atmospheric pollution merit the closest attention.

Heredity

The aetiology of a disease is never simple: no disease has a single cause. In the same way that healthy constitutions are the result of the interplay of multiple inborn and acquired factors, the states of disease are produced by several genetic and environmental influences acting together. In some diseases an inherited predisposition is the important aetiological factor, while in other cases the genetic influence is slight. A number of investigators, notably Sir Ronald Fisher, have stressed the importance of genetic factors in the development of lung cancer. To explain the obvious association with cigarette smoking, Fisher²⁰ has argued that the tendency to adopt the smoking habit is determined to a great extent by the genotype: those who have inherited a desire to smoke may also have inherited a susceptibility to develop lung cancer. In terms of his hypothesis, cigarette smoking should not be regarded as a cause of lung cancer, but merely as an associated genetic trait. Fisher has derived this theory largely from a study of the smoking habits of a small group of German twins. In this study, it was found that identical (monozygous) twins were more likely to have similar smoking habits than non-identical (dizygous) twins. Lilienfeld²¹ has critically reviewed Fisher's methods and has found them to be quite unsatisfactory. Fisher's information on smoking habits had been obtained by means of a postal questionnaire; only a selected number of the available twins were sent the questionnaire and less than half of these had replied. In one of Fisher's series, only 33 replies were available from an original list of 144 twin pairs. It is clearly not possible to draw any valid conclusion from a study based on such inadequate sampling.

If experience with other common cancers — cancer of the breast, stomach and cervix — can be taken as a guide, there is every reason to expect that a genetic factor will be found in the complex aetiology of lung cancer. In large surveys the close relatives of cancer patients usually show a slightly greater tendency than controls to develop that particular cancer. No adequate study of this sort has yet been reported for lung cancer. In the case of stomach cancer, those who have inherited blood group A have a slightly greater tendency to develop the disease, but lung cancer patients do not show any peculiar distribution of their ABO blood groups.²² Even where family studies and blood-group surveys have shown a genetic component in the aetiology of a common cancer, this component has always been a very small one, and it is likely that in the case of lung cancer heredity will similarly be found to play a minor part.

Atmospheric Pollution

The well-established association of industrial lung cancer with inhaled irritants has led investigators to consider general atmospheric pollution as a possible cause of lung cancer. In terms of this hypothesis, the increasing incidence of lung cancer is not attributed to the increasing consumption of cigarettes, but rather to the increasing contamination of the atmosphere by industrial smokes and by petrol and diesel fumes. Support for this hypothesis is found in the observation that the incidence of lung cancer is lower in rural than in urban areas.

In South Africa, Dean¹⁰ has repeatedly stressed the importance of atmospheric pollution and his findings have been given considerable prominence in the R.C.P. report. Dean's interest in the problem arose out of his clinical impression that lung cancer in South Africa is less common than would be expected from the tremendous number of cigarettes which are consumed. White South Africans are amongst the heaviest cigarette smokers in the world, yet the incidence of lung cancer here is less than that in Britain. Dean scrutinized the death certificates at the South African Bureau of Census and Statistics and found that in 1947-56, in 45-64-year-old White men, the death rate from lung cancer was 44% higher in English-born than in the South African-born. He attributed this not to a difference in cigarette smoking, but to the greater degree of atmospheric pollution to which the English-born had been subjected before migrating to South Africa. Yet Dean himself has published data which indicate that atmospheric pollution in South African cities is no less than in England (Table V). He also reports figures on the length

TABLE V. COMPARISON OF ATMOSPHERIC POLLUTION IN SOME SOUTH AFRICAN AND BRITISH CITIES¹⁰

Cities	Smoke in mg./cubic metre		Insoluble solid deposits in G. per month on 1-ft. diameter circle	
	Summer	Winter	Summer	Winter
Pretoria	0.12	0.23	0.27	0.27
Johannesburg:				
City	0.17	0.29	0.60	0.41
Suburbs	0.08	0.18	0.23	0.14
Durban	0.13	0.18	0.36	0.28
Leicester (England)	0.06	0.13	0.14	0.20
London:				
Kensington	0.12	0.24	0.22	0.28
St. Pancras	0.16	0.30	0.21	0.24

of South African cigarette butts which show that the average butt in this country is from 23 to 26 mm. long—about 10 mm. longer than the average English butt. Here then is a partial explanation for the lower South African lung cancer incidence: like the Americans, White South Africans smoke more cigarettes, but they smoke less of them than the English do.

In a subsequent investigation, Dean²³ conducted a retrospective study of the smoking habits of all the White South Africans aged 45-64 years who had died from lung cancer between 1947 and 1956. The study was based on a questionnaire or a personal visit to the widows of the dead men. A similar study was carried out on a control group consisting of age-matched men from a similar residential background who had died from causes other than lung cancer. This was a most ambitious project and it is not surprising that replies were obtained from barely 50% of the listed cases. Such a poor level of ascertainment must lead to considerable sampling bias, and there is little doubt that this has accounted for Dean's remarkable results. Of 603 lung cancer deaths, only 12 occurred in non-smokers (2%); among 547 men who had smoked more than 25 cigarettes per day, 330 died from lung cancer (60%); of the 147 men who had smoked more than 50 cigarettes daily, 102 died from lung cancer (66%)! It is even more remarkable that after publishing these alarming figures, Dean still believes that atmospheric pollution is of the greatest importance in causing lung cancer. His statement that 'In both South Africa and the UK the elimination of air pollution from urban areas would substantially reduce the incidence of lung

cancer even if no change occurred in smoking habits' can only be met with incredulity.

In Europe and in America epidemiological surveys have been carried out on urban and rural populations to determine the relative importance of atmospheric pollution and cigarette smoking. Hammond and Horn,¹⁴ in the USA, found no cases of lung cancer among rural non-smokers, but there was a small number of cases in urban non-smokers; on the other hand, the incidence of lung cancer in rural smokers was considerably greater than in urban non-smokers (Table VI).

TABLE VI. AGE-STANDARDIZED LUNG CANCER MORTALITY RATIOS PER 100,000 MEN PER YEAR IN USA URBAN AND RURAL AREAS¹⁴

Residence	Non-smokers	Cigarette smokers
Rural	0	65.2
Large town*	14.7	85.2

* Population of 50,000 or more.

In Los Angeles, where atmospheric pollution is a major problem, only 2 cases of lung cancer were encountered among Seventh Day Adventists—a religious group who do not smoke.²⁴ In a comparable group of controls, 16 cases of lung cancer occurred. Both the Adventist cases occurred in recent converts who had formerly smoked heavily. All the other types of cancer occurred with equal frequency in the Adventists and in the general population.

Turning to Europe, reports from Finland²⁵ and from Jersey²⁶ indicate that, while atmospheric pollution is minimal in these two areas, there is a great deal of cigarette smoking and the incidence of lung cancer is very high. In England, Hillis²⁷ has described 100 consecutive cases of lung cancer among rural dwellers, all of whom were smokers. An urban-rural comparison by Stocks and Campbell²⁸ has produced similar results to the American survey: cigarette smokers have a much higher incidence of lung cancer than non-smokers, irrespective of where they live, but at comparable levels of cigarette smoking there is a somewhat higher incidence of the disease in urban dwellers.

Summing up the results of these and other geographical surveys, it is clear that those who live in the cities have a slightly greater tendency to develop lung cancer than their country cousins. The hazard of urban living, however, is small compared with that of cigarette smoking. There is much to be said in favour of eliminating atmospheric pollution from the cities, but even if this is achieved the decline in lung cancer will be small. But if cigarette smoking were to cease, the death rate from lung cancer would fall to one fifth or, perhaps, in men, to one tenth of its present level, and the saving of lives would be considerable.

PREVENTIVE MEASURES

The R.C.P. report discusses measures for preventing the harmful effects of cigarette smoking under two headings: procedures aimed at making cigarette smoking safer and methods for discouraging smoking altogether.

Safer Smoking?

For those who will not give up smoking, the report suggests that improved filters should be developed and that less noxious strains of tobacco should be cultivated. These suggestions are not realistic: as long as the specific carcinogens remain unknown, the efficacy of filters and the harmlessness of different tobacco species can only be determined by prolonged and scrupulously controlled trials in man—and the difficulties to be expected in setting up such trials make the proposition an impossible one from the start. The report suggests that smokers should be encouraged to throw away their cigarettes after just a few puffs so that they will only inhale smoke that has been filtered by a long column of tobacco; it will probably be not much more difficult to encourage smokers to throw away their cigarettes without having lit them at all! The report also suggests that cigarette smokers should be advised to change to smoking pipes or cigars, since these are less likely to cause lung cancer. Doctors, however, may live to regret offering such advice if later it is found that an increase in pipe smoking leads to a considerable increase in the incidence

of lip and tongue cancer. The R.C.P. report errs in not making it absolutely clear that in the present state of knowledge the only practical prophylactic procedure is the complete abolition of cigarette smoking.

Education

To discourage cigarette smoking, the report considers both educational and legislative procedures. It recommends that intensive efforts should be made, particularly among the school children and among the general public, to ensure that the evils of smoking are fully understood. In this connection, it is pointed out that in 1960, in Great Britain, the local authorities spent £200 on posters and pamphlets dealing with the dangers of cigarette smoking; during the same year, the tobacco industry spent £11,000,000 in advertising its wares. The merit of disseminating public health information is often belittled, but it is worth noting that in England the publicity which accompanied the publication of the R.C.P. report produced a significant and sustained slump in the sale of cigarettes.²⁹ The main force of the educational campaign should be directed at discouraging adolescents from adopting the cigarette habit: once the habit is established, its eradication becomes difficult.

Legislation

The problem of legislation against cigarette smoking is a difficult one. The government's duty is clear: their responsibility for the common health leaves them with no alternative but to legislate against this hazard. However, the form of the necessary fiscal procedures cannot so easily be delineated. The unfortunate history of alcoholic prohibition in the United States of America has forever frightened legislators away from again attempting such a radical approach to a widespread and strongly entrenched public vice. Less direct measures will have to be invoked. To start with, strong governmental support must be given to an intensive educational campaign in which the hazards of cigarette smoking are unequivocally stated. At the same time, legislation should be introduced to limit the quantity and the content of cigarette advertisements, particularly those which aim at promoting the habit among young people. In Italy, tobacco advertisements have been banned; there is no good reason why a similar ban should not be enforced in this country — the advertising of less harmful commodities is already strictly controlled. A similar ban should also be imposed on automatic cigarette-vending machines which are a popular source of supply for misguided school children. Legislation to forbid all smoking in public places (halls, theatres, etc.) and on public transport should be enforced without delay. Smoking in confined places is a menace to the health, not only of smokers but of non-smokers as well. Cigarette smoke may cause extreme distress to persons with respiratory or heart disease, and most physicians have had the unhappy experience of dealing with fatal or nearly fatal cases of chronic bronchitis in whom acute exacerbations have been provoked by an evening spent in a smoke-filled theatre. Finally, the government should exert its most effective deterrent — taxation — to discourage the purchase of cigarettes. In this country, cigarettes are far too cheap and the price of a packet is too readily within the reach of even the limited pocket-money of school children.

In planning their approach to the legislature, the medical profession should clearly understand the difficulties with which the government is faced. In South Africa the tobacco industry is an important one; it provides employment for many and it is a major source of national revenue. In 1958, excise duty on cigarettes and tobacco contributed R36,140,000 to the total national revenue of R636,844,000; this contribution was even greater than that of the gold-mining industry (R35,142,000).³⁰ Thus, approximately 6% of the national revenue is provided by the tobacco industry, and no government can be expected to give this up happily. But, when the nation's health is at risk, considerations of economic expediency must be thrust aside. Alternate sources of national income must be found and the wise and benevolent men who control the tobacco industry must plan to invest their money and skill in less harmful enterprises. There are plenty of examples in the past of established industries being converted to entirely new lines of production when the demand for their

original product ceases. It is not the fault of the tobacco industrialists that after several centuries of use, their product has been shown to be potentially lethal; but now that the danger has clearly been demonstrated, the moral justification of their continued output must be questioned.

SMOKING AND LUNG CANCER IN THE AFRICAN

In any discussion concerning the abolition of cigarette smoking in South Africa, special attention must be paid to the smoking habits of the non-White population. Like syphilis, tuberculosis and alcoholism, cigarette smoking is one of the less meritorious contributions of the Western world to African civilization. At present, cigarette smoking is still much less common among the non-Whites than among the Whites. In 1957, the 2.7 million White South Africans smoked 7.4 thousand million cigarettes, while the 10 million non-Whites smoked only 4.0 thousand million.³¹ Not only are there fewer smokers among the non-Whites, but those who do smoke consume fewer cigarettes than the Whites do.

The common diseases associated with cigarette smoking — lung cancer, coronary heart disease and chronic peptic ulcer — are not common in the African, although one has the impression that their incidence may be increasing. The clinicians' impression of the rarity of lung cancer in the African is supported by several pathological surveys. In Salisbury, Gelfand³² found only 7 cases of lung cancer in 408 cancer specimens submitted for pathological study (1.7%). In a preliminary report from the Cancer Survey of Uganda, Davies³³ noted that only 3 cases of lung cancer occurred in a total of 286 male cancer patients (0.9%). In Johannesburg, in the course of the Transvaal Cancer Survey, Higginson and Oettlé³⁴ found a rather higher proportion of respiratory cancer cases among the Bantu. During 1953-1955, there were on the average 173 cancer patients per year among the Johannesburg urban Bantu male population; of these an average of 14 were due to lung cancer (8%). It will be noted that in the above 3 surveys, the lung cancer incidence is stated as a percentage of all cancer cases: the vital statistics of African communities are not yet sufficiently developed to provide accurate standardized mortality ratios by which the disease incidence can be stated in terms of the whole population. Consequently, no direct comparison can be made of the incidence of lung cancer in White and non-White South Africans. However, from the data presented by Higginson and Oettlé³⁴ and from information supplied by the Bureau of Census and Statistics, a comparison can be made of the lung cancer incidence in the Johannesburg Bantu and in White South Africans; this is shown in Table VII.

TABLE VII. COMPARISON OF ANNUAL CANCER AND LUNG CANCER DEATHS: URBAN BANTU MALES IN JOHANNESBURG (1953-1955)³⁴ AND THE SOUTH AFRICAN WHITE MALE POPULATION (1954)

Deaths	Total number		Number per 100,000 population	
	White	Bantu*	White	Bantu
All cancer deaths ..	2,059	173	147	65
Lung cancer deaths	336	14	24	6
Lung cancer deaths as a percentage of all cancer deaths	16%	8%	—	—

* Average per year, 1953-1955.

It will be seen that in Johannesburg urban Bantu men (a comparatively sophisticated Bantu community) the overall cancer death rate is less than half the rate in the White South African men. The lung cancer death rate in this Bantu group is only a quarter of that in the Whites. In South African White men, 16% of malignant growths are due to lung cancer — twice the ratio for the Johannesburg Bantu men.

The problem, then, is how to maintain this desirable low-smoking — low-cancer situation in the African. It is a difficult problem. Experience with the liquor laws has taught that differential restriction of a commodity among the African can no longer be contemplated. On the other hand, the production and sale of 'cheap' cigarettes for African consumption is to

be deplored and must be banned. An increase in tobacco taxation with a rise in the cost of cigarettes can be expected to limit considerably the Africans' ability to buy cigarettes. In addition, restriction of cigarette advertising and an augmented programme of health education will also help to achieve the desired effect. The educational programme will be most effective if it is sponsored by leaders of the African community themselves; they are in a stronger position to advise their fellows that cigarette smoking is one of the attributes of White civilization which intelligent Africans should not try to emulate.

THE ROLE OF THE DOCTORS

About 6 weeks after the publication of the R.C.P. report in London, it was reported in a Cape Town newspaper that the Minister of Health had stated that he was not considering action to discourage smoking in South Africa.²⁴ The Minister was quite right in taking this attitude because no responsible medical organization in this country had yet officially warned the public or the Ministry of Health of the potential dangers of cigarette smoking. It is now high time that such a warning should be issued, and the Medical Association should lose no time in putting the facts before the Minister and before the people of South Africa.

The evidence which the R.C.P. committee has so ably marshalled in its report should leave the individual doctor with little doubt as to his own responsibilities. He must categorically advise his patients with bronchitis, peptic ulcer, ischaemic heart disease and peripheral arterial disease to stop smoking. The family doctor must take every opportunity to counsel the people for whose health he is responsible to stop smoking. When such wise counsel is offered, the doctor is often told: 'Well, I've been smoking for 20 years already, so it's not going to help if I stop now.' But all is not lost: the prospective study of Doll and Hill²⁵ in British doctors showed that in smokers who gave up the habit, the chances of developing lung cancer were substantially reduced (Table VIII).

TABLE VIII. THE EFFECT OF STOPPING SMOKING ON THE SUBSEQUENT DEVELOPMENT OF LUNG CANCER IN BRITISH DOCTORS¹³

Smoking habits	Age-standardized death rate from lung cancer per 1,000 doctors
Never smoked	0.07
Stopped for more than 10 years ..	0.35
Stopped for less than 10 years ..	0.59
Have not stopped	1.03

Despite the strength of the case which can be made to persuade smokers to give up cigarettes, in practice it is simpler to advise young persons against starting to smoke rather than to try and break the habit once it has become established. Parents should be warned that children start to smoke in imitation of their elders, and parents who smoke themselves will find it difficult to stop their children from developing the same unfortunate habit. A recent American study²⁵ shows very well how the parents' example influences their offspring (Table IX).

TABLE IX. SMOKING HABITS OF ADOLESCENTS IN RELATION TO PARENTAL SMOKING²⁵

	Percentage of children who smoked regularly	
	Boys	Girls
Neither parent smoked ..	16.7	6.8
Only father smoked ..	26.3	12.4
Only mother smoked ..	23.6	18.1
Both parents smoked ..	37.9	18.5

But what of the parents? Can they be expected to take the doctor's admonitions seriously if the doctors themselves continue nonchalantly to smoke? The R.C.P. committee has no illusions about this: *The doctor who smokes will inevitably lessen the effect of any campaign of public education con-*

cerning the consequence of the habit and will find it harder to help his patients who need to stop smoking. When their report was published a press conference was held at the Royal College of Physicians in London, and one of the first questions asked by the reporters was about the smoking habits of the committee members themselves. The *Times Weekly Review* reported the answer as follows:⁹

'Sir Robert Platt, President of the College, said that when they started they had two heavy cigarette smokers among them; now there was only one, or perhaps none. He gave up smoking in 1954, he said.

'Of the other members of the investigating committee present Dr. J. N. Morris said he gave up smoking cigarettes after the evidence began to appear and now smoked two miniature cigars a day; Dr. J. A. Scott, L.C.C., Medical Officer of Health, said he smoked a pipe; Dr. J. G. Scadding gave up smoking in 1945; and Dr. C. M. Fletcher, secretary of the Committee, who used to smoke a pipe and cigars, said that in the past eight months he had smoked only three cigars.'

The average layman cannot be expected to read the R.C.P. report and to appreciate the finer points of the prospective and retrospective investigations and of the experimental, clinical and pathological studies which it describes. He will, however, be interested to know whether his own doctor has read the report and consequently has stopped smoking himself. From the layman's point of view the most impressive piece of information in the report is that which deals with the change in the smoking habits of British doctors. Since 1951, when the dangers of cigarette smoking became generally known, there has been a marked decrease in cigarette smoking among British doctors. In 1951, 46% of doctors smoked cigarettes; by 1961, the number had fallen to 31% (Fig. 3).

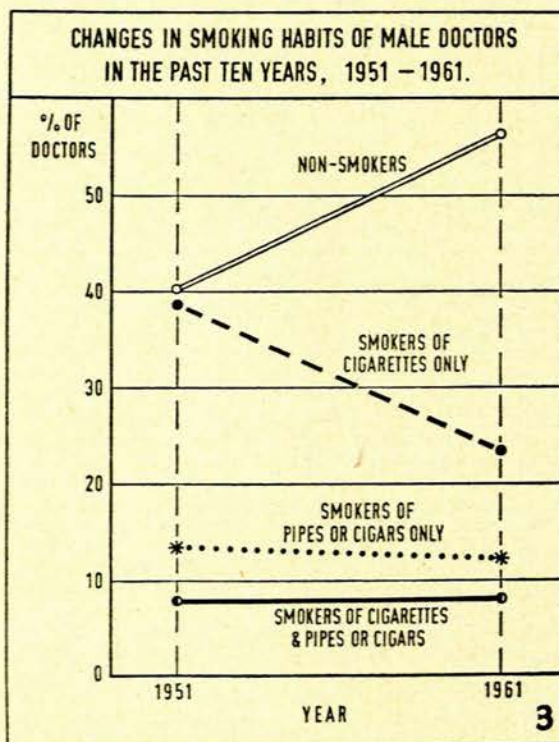


Fig. 3. Note the increase in the proportion of non-smokers since 1951. Reproduced from *Smoking and Health* by kind permission of the Royal College of Physicians of London.

It is hoped that in South Africa, the medical profession will do likewise and so set a sensible example for their patients to follow.

CONCLUSION

In the first half of this century, the establishment of effective measures for the prevention of infectious diseases and the introduction of effective drugs for the treatment of these diseases combined to bring about a steady decrease in the overall death rate. The vital statistics for White South Africans clearly showed this trend (Fig. 1). The infectious diseases no longer headed the lists of the common causes of death and their place was taken by heart disease and cancer. But during the last 15 years, the overall death rate has no longer been falling — the salutary effect of a falling mortality from infectious diseases having been neutralized by the rising incidence of heart disease and cancer. It is a sobering thought: despite the Herculean labours of research workers and the avalanche of learned publications, as far as the overall death rate is concerned, medical science has made no advance in the last 15 years.

If the decline in the overall death rate is to be resumed, then it is necessary for heart disease and cancer to be controlled in the same way that infectious diseases are largely under control. With regard to heart disease, there are already indications that such control may become feasible: the extensive use of antibiotic prophylaxis may decrease the morbidity and mortality from rheumatic heart disease; the judicious application of the newly developing agents for lowering the blood pressure can be expected to improve the life expectancy of patients with hypertensive disease; and there is the possibility that dietary measures aimed at decreasing the serum-cholesterol level may limit the development of ischaemic heart disease. In none of these cases can it be said categorically that the recommended measures will produce an immediate and striking fall in mortality, but as far as lung cancer is concerned, the evidence is clear and the directive is unequivocal: **stop cigarette smoking and there will be a 70-80% fall in the incidence of lung cancer.**

The situation today is similar to that in 1753. In that year, James Lind demonstrated the efficacy of lemon juice in the prevention of scurvy, but it was 41 years before his recommendations were implemented. During those 41 years, to the enduring shame of the medical profession, thousands of persons died from what had become an eminently preventable

disease. If the medical profession of today is to escape similar ignominy, it must take determined and concerted action to stop the smoking of cigarettes and so to prevent thousands of unnecessary deaths from lung cancer.

REFERENCES

1. King James I (1604): *A Counter-Blaste to Tobacco*. Reprinted 1954. London: Kodale Press.
2. Cope, Z. (1961): *Some Famous General Practitioners and other Medical Historical Essays*. London: Pitman.
3. World Health Organization (1960): *Wld Hlth Org. Techn. Rep. Ser.*, 192.
4. Medical Research Council (1957): *Brit. Med. J.*, **1**, 1523.
5. U.S. Study Group on Smoking and Health (1957): *Science*, **125**, 1129.
6. Netherlands Ministry of Social Affairs and Public Health (1957): *Ned. T. Geneesk.*, **101**, 459.
7. Royal College of Physicians of London (1962): *Smoking and Health*. London: Pitman.
8. *Medical Notes in Parliament* (1962): *Brit. Med. J.*, **1**, 952.
9. *Times Weekly Review*, 15 March 1962.
10. Dean, G. (1959): *Brit. Med. J.*, **2**, 852.
11. Todd, G. F. (1959): *Statistics of Smoking*. Tobacco Manufacturers' Standing Committee Research Papers, No. 1, 2nd ed., London.
12. Wynder, E. L. and Graham, E. A. (1950): *J. Amer. Med. Assoc.*, **143**, 329.
13. Doll, W. R. and Hill, A. B. (1956): *Brit. Med. J.*, **2**, 1071.
14. Hammond, E. C. and Horn, D. (1958): *J. Amer. Med. Assoc.*, **166**, 1294.
15. Hilding, A. C. (1956): *New Engl. J. Med.*, **254**, 775.
16. Kennaway, E. L. (1957): *Brit. Med. J.*, **1**, 299.
17. Wynder, E. L., Graham, E. A. and Croniger, A. B. (1958): *Cancer Res.*, **18**, 1263.
18. Hamer, D. and Woodhouse, D. L. (1956): *Brit. J. Cancer*, **10**, 49.
19. Auerbach, O., Stout, A. P., Hammond, E. C. and Garfinkel, L. (1961): *New Engl. J. Med.*, **265**, 253.
20. Fisher, R. A. (1958): *Nature*, **182**, 108.
21. Lilienfeld, A. M. (1961): *Ann. N.Y. Acad. Sci.*, **91**, 797.
22. McConnell, R. B., Clarke, C. A. and Downton, F. (1954): *Brit. Med. J.*, **2**, 323.
23. Dean, G. (1961): *Ibid.*, **2**, 1599.
24. Wynder, E. L., Lemon, F. R. and Bross, I. J. (1959): *Cancer*, **19**, 1016.
25. Kouloumies, M. (1953): *Acta radiol.*, **39**, 255.
26. Report of the Ministry of Health for the Year 1960. (1961): Part II. *On the State of the Public Health*, p. 8. London: Her Majesty's Stationery Office.
27. Hillis, B. R. and Cameron, J. A. (1960): *Thorax*, **15**, 240.
28. Stocks, P. and Campbell, J. M. (1955): *Brit. Med. J.*, **2**, 923.
29. *Sunday Times* (London) 8 April 1962.
30. Bureau of Census and Statistics (1960): *Union Statistics for Fifty Years, Jubilee Issue 1910-1960*. Pretoria: Government Printers.
31. Gelfand, M. (1949): *S. Afr. Med. J.*, **23**, 1010.
32. Davies, J. N. P. (1961): *E. Afr. Med. J.*, **38**, 486.
33. Higginson, J. and Oettle, A. G. (1960): *J. Nat. Cancer Inst.*, **24**, 589.
34. *Cape Times*, 21 April 1962.
35. Horn, D., Courts, F. A., Taylor, R. M. and Solomons, E. S. (1959): *Amer. J. Publ. Hlth*, **49**, 1497.