



light tobacco as a major cause of lung cancer have been challenged. The mouse-cancer experiments have been minimized as having little relation to cancer in the human lung.

What are the facts?

Before World War I, lung cancer was rare. But after 1920, U. S. doctors began to encounter it more and more frequently and there was a sharp uptrend in deaths: 3400 in 1933, 8800 in 1942, 22,000 in 1952. Last year Dr. E. Cuyler Hammond, chief of statistical research for the American Cancer Society, declared: "The alarming fact is that the trend shows every indication of continuing."

The future implications of this trend make cancer specialists shudder. Dr. Alton Ochsner, New Orleans surgeon, says: "Unless measures are instituted to stop the increase, I predict that by 1970 . . . one out of every ten or 12 men living at that time will have cancer of the lung."

Is the reported increase merely the result of improved diagnostic methods? Few responsible authorities think so. The American Cancer Society states: "It seems more likely than not that some of the increase in reported lung-cancer deaths probably is due merely to improvements in diagnosis, but it is now generally agreed that most of the increase is real."

Lung cancer is predominantly epidermoid cancer which, unlike other types, seems to be influenced by an external carcinogen (cancer-

producing agent). So when scientists began their search for the lung carcinogen they looked for some factor which has become increasingly present in our environment during the past half century — preferably something that is inhaled into human lungs.

Obviously, the very air we breathe has become increasingly polluted with smoke, soot, chemicals and fumes from gasoline and fuel oils. Some of these contain recognized carcinogens. So air pollution is getting careful study, and may prove to play a role in lung cancer.

But the air-pollution theory stumbles over one inescapable fact — men and women breathe the same polluted air about equally; yet lung cancer is at least eight times more prevalent among males than among females. Hence, if the major cause of lung cancer is something inhaled, the inhalant must be something that figures differently in the habits of males and females.

Suspicion of tobacco was inevitable. And when researchers compared the sales figures for cigarettes and the statistics for lung cancer they noticed a remarkable parallel. *On the charts the rising lung-cancer curve bears a striking resemblance to the curve which plots the cigarette sales.*

Lung cancer usually occurs in men over 45. There is good reason to believe that there is a time lag of at least 20 years in its development. Hence doctors saw a link between rising cigarette consumption in 1920-

30 and mounting lung-cancer deaths in 1940-50. If the relationship is real, the booming cigarette sales of 1940-50 indicate a soaring death rate in 1960-70.

What about the women? They took up smoking slowly during the 1920's, and the habit became widespread after 1930. Even today there are fewer women than men smokers, and fewer still are heavy smokers. Yet the lung-cancer death rate among women has increased in proportion to their consumption of cigarettes, and is still rising.

True, this might be mere coincidence. But the cancer men didn't let the matter rest there.

At Washington University young Dr. Ernest L. Wynder (now on the staff of Memorial Cancer Center) won approval for an ambitious research project from his chief, Dr. Everts A. Graham, distinguished professor of surgery who performed the first successful removal of a cancerous lung. Wynder proposed to shelve the "circumstantial evidence" in the statistics and to study the tobacco-lung-cancer relationship at first hand.

In a dozen states he enlisted the cooperation of hospitals that had many patients with lung cancer and many more without the disease. Staff interviewers carefully took down each patient's age, personal history, smoking habits, etc.

The Wynder-Graham studies, first published in 1950, showed that of 650 men with lung cancer more than 95 percent had been smoking

for 20 years or more. The doctors observed: "The occurrence of carcinoma of the lung in a male nonsmoker is a rare phenomenon." They concluded: "Excessive and prolonged use of tobacco, especially cigarettes, seems to be an important factor in the induction of bronchiogenic carcinoma (lung cancer)."

The report created quite a stir in the medical profession. Some doctors lately refused to recognize tobacco as the culprit. Dr. Wynder told the Cancer Prevention Committee: "Those physicians who were hardest set against believing that tobacco might play a role in the etiology of lung cancer were heavy smokers themselves. It is only human for one not to believe that harm can come from something one likes."

But more evidence was on the way. From 1948 to 1952 Drs. Richard Doll and A. Bradford Hill interviewed nearly 5000 patients in British hospitals. Out of 1357 men with lung cancer *all but seven* were smokers. Drs. Doll and Hill concluded: "Smoking is a factor, and an important factor, in the production of cancer of the lung."

To date, 13 independent studies of the tobacco-cancer relationship have been made in five different countries. While the findings differ in degree, all these investigators come to the same conclusion: lung cancer occurs more frequently among smokers than among nonsmokers.

Despite the dissenting opinions of some doctors (none of whom have engaged in firsthand studies of

the problem) the relationship is recognized today by most authorities. The American Cancer Society now takes the official position "that evidence to date justifies the suspicion that smoking does, to a degree not yet determined, increase the likelihood of developing lung cancer." The British Ministry of Health and the International Symposium on Lung Cancer (sponsored by the World Health Organization) have made similar pronouncements.

But if cigarettes can cause lung cancer, why don't all or most cigarette smokers develop the disease?

The theory has been offered that everyone inherits either a constitutional susceptibility or an immunity to cancer-causing agents. Says Dr. Charles Oberling, French cancer authority: "It is probable that many smokers are protected against cancer of the respiratory passages by their hereditary constitution. This offers poor consolation, however — for who knows whether or not he is to be numbered among these favorites of fortune?"

What is the particular agent in tobacco smoke that causes lung cancer? The answer to that most important question may be forthcoming soon.

Drs. Wynder and Graham and Dr. Adele Croninger have recently proved beyond doubt that there is something within tobacco tar which can cause cancer in mice. To produce tobacco tar under conditions as near as possible to human smoking, the doctors rigged up an ap-

paratus that pulled 60 cigarettes at once. The smoke was drawn into glass condensing flasks. After the tar was extracted it was painted on the shaved backs of mice three times each week. After an average of 71 weeks, about half of a mouse life span, 44 percent of the tarred mice developed cancer — and it was the epidermoid type that occurs in human lungs.

People who argue that mouse skin is not human lung tissue miss the point. The experiment establishes the mouse as a reliable *test animal* for tobacco-cancer research. Wynder and Graham used it to prove that there is a carcinogen in tobacco tar. The next step is to use mice to determine what fraction of tobacco tar is the carcinogen.

That work is now under way at the Institute of Industrial Medicine at the NYU Postgraduate Medical School. There tobacco tar goes through an endless fractionation process. Then the many fractions must be tested separately on mice.

But every tar fraction, in turn, contains an enormous number of chemical compounds. Coal-tar research has proved that some of these compounds — particularly the hydrocarbons which are formed when any organic substance burns at high temperature — can cause cancer.

Are carcinogenic hydrocarbons formed in a burning cigarette? That's one of the big questions they are trying to answer at NYU.

Last year a German scientist, Dr. H. Druckrey, performed a startling

demonstration which has since been repeated at the Memorial Cancer Center. It is based on the fact that certain chemical compounds, including the hydrocarbons, show a fluorescence when exposed to ultraviolet light.

Druckrey had his students smoke cigarettes and — without inhaling — blow the smoke into a flask of purified benzene. Then the flask was exposed to ultraviolet light; the intensity of the glow was measured with a spectrograph. By chemical analysis Druckrey identified more than 50 percent of the fluorescent material as "higher aromatic hydrocarbons."

The most dramatic phase came next. Druckrey now had his subjects smoke another cigarette and *inhale the smoke* before blowing it into the flask. Measurements showed that virtually all the fluorescent materials — including the suspected hydrocarbons — were retained in the lungs.

"With inhalation," he reported, "more than 90 percent of the fluorescent materials was retained, so that in the course of a lifetime the bronchial tract would be systematically tarred. Therefore, the cancer risk from tobacco smoke is incurred especially by inhaling."

Can the potentially dangerous tars be filtered from the smoke? Druckrey investigated various cigarette filters and generally confirmed the findings of the investigation made last year by the American Medical Association. The most efficient tips and holders absorbed only

50 percent of the tars; 80 percent of the tips screened out less than ten percent.

But how about the possibly dangerous fractions of the tars? "The investigated filters," Druckrey reported, "offer no protection against the higher aromatic hydrocarbons." So, if filtration is the protection of the future, the tobacco companies will have to produce a more efficient filter than any they offer today.

Two agencies are now engaged in a vast human experiment. The U. S. Public Health Service is canvassing the smoking habits of more than 80,000 veterans of World War I, who are now in the age brackets most likely to show lung cancer. The American Cancer Society, through its volunteer field workers, has tabulated the smoking habits of 204,000 men between the ages of 50 and 69. These men are followed up annually. When one dies the cause of death is determined, and if it is cancer the medical records are studied carefully.

Many doctors predict that these studies will confirm the findings of previous surveys. Dr. Hammond of the American Cancer Society cites another possibility: "It may turn out that cigarette smoking not only greatly increases the probability of lung cancer but also markedly increases the death rate from other causes."

Investigators outside the cancer field — particularly those concerned with heart and vascular diseases — agree with this view. They feel that the lung-cancer problem has di-

verted needed attention from tobacco's effects on other vital organs.

That's where we stand now. The final answer must come from chemical, biological and clinical studies now under way in many research institutions. The American Cancer Society, the Damon Runyon Fund and the Government's National Cancer Institute are backing the work. The leading cigarette manufacturers have formed the Tobacco Industry Research Committee and pledged its aid and assistance to the research

effort into all phases of tobacco use and health."

For the present, cigarette smokers must weigh the available evidence and ask themselves: are the psychological pleasures of the habit worth the possible risks involved?

That's a question which each individual smoker must answer for himself.

Reprints of this article are available. Prices, postpaid to one address: 10—30 cents; 50—\$1.25; 100—\$3.25; 500—\$10; 1000—\$17. Address: Reprint Edition, The Reader's Digest, Pleasantville, New York.



*Pardon, Your Slip Is Showing*

From the Waukegan, Ill., *News-Sun*: "LaMont McKeon nerved the bridegroom as best man."

From a society note in the Warren, Ohio, *Tribune Chronicle*: "The party, which was to have been held on the spacious lawn at the Kroehle home, was held indoors because of rain. . . ."

From the New York *Herald Tribune* description of the new Mrs. America: "Mrs. Jennings, twenty-eight, is 5 feet 9½ inches tall, weighs 135 pounds and has a thirty-five-inch bust, twenty-five-inch waist and thirty-six-inch hips."

From an ad in the Washington, D. C., *Times-Herald*: "You'll agree with us it's the coolest suit we know of."

As in the Winnipeg, Man., *Free Press Prairie Farmer*: "Swedish Canadian bachelor farmer in forties, with good home and farm. Would like to get acquainted with lady in the thirties. Object matrimony."

From the Lancaster, Pa., *Sunday News*: ". . . former President Truman has accepted an invitation to attend a meeting at which leaders will draw the battle lines for the 1954 congressional campaign."

From the Edinburgh *Evening News*: "A boom in every home is the new pressure cooker." — *Quoted in Picture Post*

IN AN ARTICLE in *Modern Screen*, Shirley Temple was quoted as saying: "Most of our eastern friends went to bed quite early, worked, and had children; so I followed their pattern."

# INDIANA STOPS FEDERAL WELFARE ABUSES

Condensed from *Nation's Business*  
Craig Thompson

When the people of Elkhart County, Indiana, (pop. 84,512) elected D. Russell Bontrager

*A young district attorney began to wonder about secrecy in administration of federal aid—and things began to happen*

billion dollars in 1946. That figure was doubled in 1953.

More disturbing than the money,

prosecuting attorney in 1945 neither he nor they had any notion that they were embarking on a billion-dollar revolt against the welfare state.

The 14 years preceding Mr. Bontrager's election had been marked by a gradual concentration of power in federal hands. State and county governments had surrendered varying degrees of control over their affairs to a growing bureaucracy in Washington. This trend was especially marked in the field of welfare; in fact the welfare people held themselves accountable only to God.

The giveaway program these people administered was huge. Aside from the sums paid out under Old Age and Survivors Insurance, commonly called Social Security, federal and local handouts to old people and dependent children exceeded one

however, was the fact that two attitudes were secretly at work which constituted a double-barreled threat to the American way of doing things. These had been summed up in a booklet distributed to state and county welfare workers by the Federal Security Agency. In handing out this vast sum, the FSA solemnly urged its local agents to "think and feel in terms of the applicant's needs, and be less protective of the taxpayer."

*This approach, the FSA booklet said, was "a basic essential for attainment of the socialized state."* In short, not only was the taxpayer's interest to be ignored but his money was to be used to destroy him.

When Russell Bontrager became district attorney in 1946 he was not aware of the existence of this brand

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