RUSSIA THE NEW DIRECTION

TIME

THE WEEKLY NEWSMAGAZINE

COMMUNIST KHRUSHCHEV

Superbombs and serviceable footwear.

MEDICINE

"Beyond Any Doubt"

For cigarette smokers, famed Surgeon Evarts A. Graham of St. Louis had news last week.

"Dr. Ernest L. Wynder and I have reproduced cancer experimentally in mice by using merely the tars from tobacco smoke. This shows conclusively that there is something in cigarette smoke which can produce cancer. This is no longer merely a possibility. Our experiments have proved it beyond any doubt."

What Dr. Graham stated as proven fact had long been suspected. Beginning in the 1930s, medical statisticians noticed an unusual rise in the number of cases of lung cancer. Part of the apparent increase was due simply to the fact that doctors were becoming more skilled in diagnosis, part to the fact that many more people were living long enough to contract cancer.

But there was something else. New Orleans' Surgeon Alton Ochsner noted that most of the patients on whom he performed daring and radical operations (removal of all or part of a lung) were men over 40 who had long been heavy cigarette smokers. He thought he saw a case of cause and effect.

First Correlation. Not until 1949 did an earnest young researcher, Ernest Wynder, then a medical student at Washington University under Surgeon Graham, supply statistical evidence: among 200 victims of lung cancer, 95.5% were men with long histories of cigarette smoking. Other researchers began to check their files on lung cancer patients and found the same thing. In Britain a massive study pointed even more sharply to the same conclusion (TIME, Dec. 22). In Denmark cancer experts who had once pooh-poohed the idea gathered more data and reversed themselves.

But no cancer-causing agent was known in tobacco smoke, so medical researchers were careful not to fall into the error of arguing *post hoc, ergo propter hoc*. For a long time, their scientific caution would let them say no more than that there must be a "correlation" between heavy, continued cigarette smoking and lung cancer.

Working with Research Assistant Adele B. Croninger, Drs. Graham and Wynder obtained tar from a machine which "smokes" thousands of cigarettes, then painted the tar on the backs of mice. It produced scores of cancers. While these skin cancers are not identical with lung cancer in man, they are so similar that the researchers are confident that human lung tissue reacts the same way.

RESEARCHERS CRONINGER & GRAHAM
For cigarette smokers, a horrendous prediction.

Said Dr. Ochsner: "This study of Drs. Graham and Wynder [published in *Cancer Research*, out this week] has proven beyond any doubt that in tobacco tar there is an agent which produces cancer. If we could find it and extract it, smoking might not be harmful. But, on the basis of the number of people who are smoking now, I predict that by 1970 one out of every two or three men with cancer will have cancer of the lung—or one out of every ten or twelve men living."

The figures are not yet so horrendous as Dr. Ochsner foresees, but lung cancer is multiplying faster than any other form of cancer, and, as a cause of death, faster than any other disease. Since 1933 the U.S. death rate from lung cancer (allowing for the growth of population) has quadrupled for men and doubled for women. The 1953 toll is expected to be 18,400 men, 3,600 women; 94% of the men and 92% of the women will be over 45. In

the same 20 years. U.S. cigarette consumption has shot up from 111 billion to about 433 billion.

The New Problem. Said Dr. Cornelius P. Rhoads, research director of Manhattan's Memorial Center for Cancer and Allied Diseases, after study of the Graham-Wynder findings: "The underlying medical question is settled. But as so often happens, we now have a new problem with social implications—how to organize and pay for the research which will show us how to remove the mouse-cancer agent from tobacco, or render it inert, and also to track down the many other factors which may be contributing to the increase in lung cancer."

There are many puzzling questions in the case against cigarette smoking as a cause of lung cancer. With answers based

Richard Meek

RESEARCHER WYNDER
On the backs of mice, a deadly proof

on the best medical opinion today, some of these are:

¶ Why indict cigarette smoking, and acquit the smoking of pipes and cigars? Because the cancer-causing factor apparently must be retained deep in the lungs, a condition usually found in cigarette smokers, who inhale deeply, not in pipe and cigar smokers, who seldom inhale.

¶ Why does lung cancer concentrate on men in middle life? Because the cancer-causing factor seems to be a slow-acting agent, which may need *half an individual's normal life span* to do its deadly work.

¶ If cigarette tar contains a cancer-causing agent, why *don't all cigarette smokers* get lung cancer? Some do not live long enough to get the cancer; many more would never get it anyhow because of the element of susceptibility, which leaves some individuals liable while the majority escape, as is true of all cancers.

Two things are certain: there is more than one type of lung cancer in humans, and there is more than one cause. Says Dr. Graham: "There are different varieties which are due to different causes. However, by far the most common variety, which makes up approximately 95% of all lung cancer, is the one that seems to be due largely to cigarette smoking."

Nicotine Acquitted. What to do? One obvious answer is to isolate and purify whatever it is in cigarette tar that causes cancer. Then, perhaps, experimental cancers can be produced faster. But no less than 45 different substances have been identified (and many more are suspected) in the tar; 15 of these, including nicotine, have been tested for cancer-causing powers and acquitted, and most of the other 30 seem unlikely culprits. At New York University's Institute of Industrial Medicine, Chemist Alvin Kosak and Physician William E. Smith are breaking down tobacco tar into several fractions and testing each on mice. Parallel work to that at N.Y.U. is going on at two or three other laboratories in the U.S. and half a dozen in Britain. Dr. Wynder himself, now working with Rhoads at Memorial, is digging into the relationship between cigarettes and cancer of the larynx.

There is no reason why research of this type should not pay off quickly if there is enough money for an all-out effort. There is a perfect textbook example: in 1945 the Standard Oil Co. of New Jersey sent a cancer-causing oil to Memorial and later to N.Y.U.'s Institute. The cancer-causing factor was identified and measures were perfected to limit the use of the oil and keep workers from being exposed to it. In the case of cigarettes, researchers are confident that the cancer-causing factor can be 1) identified and 2) removed from the tobacco in manufacture.

"Moral Obligation." Half a year has passed since Britain's Dr. Harvey Graham (no kin to St. Louis' Graham) suggested that the tobacco companies should pay for the research to bring these things about (TIME, April 6). So far, no big cigarette maker in Britain and only one in the U.S. has made a major move toward financing such research. This U.S. company's funds filter through the Damon Runyon Memorial Cancer Fund to the N.Y.U. project.

Says Dr. Ochsner: "If the tobacco people are smart—as I am sure they are, because they have been enormously successful—they will support research to find out what the cancer-producing substance is, and then take steps to remove it." Dr. Evarts Graham: "The cigarette companies are trying to induce more cigarette smoking, particularly among the young . . . many of whom will become cancer victims 20 years or so from now . . . It is certainly the moral obligation and common sense on the part of the manufacturers to support research. If we here at Washington University had more funds, we could get along faster and perhaps arrive at satisfactory conclusions within a couple of years or so."

Meanwhile, what can the cigarette addict do? Dr. Ochsner's counsel: smoke no more than half a dozen cigarettes a day, and have a chest X-ray every six months (better yet, every three months) after age 40.

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