

the latter seems to be the case. Some scientists have, tentatively, indicted tobacco. But a tremendous gap exists between such tentative indictment and a full-scale conviction shared by all scientists. This doesn't mean that you ought to sit back and laugh if your doctor suggests that you cut down on smoking. Tobacco—like fat foods, lean foods, exercise, lack of exercise, too much sunshine, too little sunshine, and a host of other factors—may be undesirable from a health standpoint for some individuals in certain circumstances. On the other hand, if you have nothing much wrong with you, tobacco—despite all the scare stories—probably is the one indulgence least likely to send you reeling toward the hospital or the grave.

Let's consider the case the scientists have been making out for—and against—the theory that smoking causes lung cancer. This line of thought has come particularly to the fore with the recent simultaneous publication of two elaborate reports in the widely circulated *Journal of the American Medical Association*.

In one of these studies Drs. Ernest L. Wynder and Evarts A. Graham, of St. Louis, compared the smoking habits of 605 men with lung cancer against the smoking habits of 780 other male hospital patients. Among the lung cancer patients they found that 96.5 per cent had been moderately heavy to chain smokers for many years. Among their "control group" they reported only 73.7 per cent who were moderately heavy to chain smokers.

CLASSED AS A CAUSE OF LUNG CANCER

Drs. Graham and Wynder put their evidence before mathematics professor Paul R. Rider, who reported that the difference was statistically significant. Thus these researchers concluded that "excessive and prolonged use of tobacco, especially cigarettes, seems to be an important factor in the induction of bronchiogenic carcinoma," or cancer of the lung.

Immediately following the Graham-Wynder article there appeared another, by Drs. Morton L. Levin, Hyman Goldstein and Paul R. Gerhardt, of the Bureau of Cancer Control of the New York State Department of Health. They compared the smoking habits of 1,045 male cancer patients with more than 600 male noncancer patients who had been hospitalized at the Roswell Park Memorial Institute. And they reported that "cancer of the lung occurs more than twice as frequently among those who have smoked cigarettes for 25 years than among other smokers (those who have smoked for a shorter period of time) or non-smokers of comparable age."

At first glance, these reports seem to provide substantial evidence of a close link between smoking and the development of lung cancer. But other experts, both practicing cancer specialists

and cancer research workers, seriously challenge both the statistics and the basic assumptions upon which both the Graham-Wynder and the Levin reports rest.

Both reports are based, in the first place, on the assumption that tobacco smoke contains some agent capable of causing cancer. This view first won favor, some years ago, when the late Professor A. H. Roffo, of the University Institute of Experimental Medicine, at Buenos Aires, identified what he believed to be cancer-causing hydrocarbons in tobacco tars. He reported consistently positive results, using these tars, in inducing cancer in laboratory animals.

But more recent research by Drs. E. Ashley Cooper, F. W. Mason Lamb, E. L. Hirst and Edgar Sanders, all of the University of Birmingham, England, and by Drs. Otto Schurch and Alfred Winterstein, of a research unit in Zurich, Switzerland, has failed to duplicate the results Dr. Roffo claimed. At the National Cancer Institute in Bethesda, Maryland, this country's leading basic cancer research center, similar attempts have also provided negative results.

In one long series of experiments, for example, Public Health Service research workers took two substantial groups of cancer-susceptible laboratory mice. One group was kept in a smoke-free chamber. The other was exposed to heavy tobacco smoke for at least half its normal life-span. After 10 months of constant exposure, the smoke-eating mice remained as tumor-free as their brothers and sisters in the control group.

Then the Public Health Service researchers went even further. They injected tobacco tars into mice of cancer-susceptible strains. They dissolved the tars in the drinking water of other mice. They put the tars under the skins of still other mice.

Despite these massive exposures, their mice failed to develop cancer. Tobacco tars, if cancerogenic at all, were demonstrated clearly to be far, far less so than coal tars and many other agents to which many industrial and mining workers are frequently exposed.

Drs. Graham and Wynder lay great stress, in their report, upon the fact that both cigarette smoking and lung cancer have apparently increased along parallel lines. "From the evidence presented," they state, "the temptation is strong to incriminate excessive smoking, and in particular cigarette smoking over a long period, as at least one important factor in the striking increase of bronchiogenic carcinoma."

Cancer researchers of the National Cancer Institute, however, take sharp issue with this point of view. They concede that their surveys show a marked increase in lung cancer. But Dr. Austin V. Deibert, chief of the Cancer Control Branch of the National Institute of Health, pointed out in a