

Müller does not say how many questionnaires were sent out, but we are told that 96 "cases" were eventually obtained—86 males and 10 females. All had died of lung cancer, as confirmed at autopsy by Cologne's university pathology institute or one of six other hospitals in the region. Additional information was gathered from the patients' medical records, and in some cases from their place of work. The 86 male "cases" (*Krankheitsfälle*) were divided into five classes: "extremely heavy smoker," "very heavy smoker," "heavy smoker," "moderate smoker," or "nonsmoker." The same was done for a group of 86 healthy "controls" (*gesunden Männern*) of the same age as the cases.⁷⁷

The results were stunning. The lung cancer victims were more than six times as likely to be "extremely heavy smokers"—defined as daily consumers of 10–15 cigars, more than 35 cigarettes, or more than 50 grams of pipe tobacco. The healthy group, by contrast, had a much higher proportion of nonsmokers: 16 percent, compared with only 3.5 percent for the lung cancer group. The 86 lung cancer patients smoked a total of 2,900 grams of tobacco per day, while the 86 healthy men smoked only 1,250 grams. Müller concluded not just that tobacco was "an important cause" of lung cancer, but that "*the extraordinary rise in tobacco use*" was "*the single most important cause of the rising incidence of lung cancer*" in recent decades (emphasis in original).⁷⁸ This is an extraordinary claim—the strongest ever issued up to that time, stronger even than any of the claims made by British or American scientists until the 1960s. Richard Doll and A. Bradford Hill's oft-cited paper of 1950, for example, concluded only that cigarette smoking was "a factor, and an important factor, in the production of carcinoma of the lung."⁷⁹ Wynder and Graham's famous paper from the same year characterized tobacco only as a "possible etiologic factor" in the increase of the disease.⁸⁰

Müller's article is notable in several other respects. For one thing, there is no obvious Nazi ideology or rhetoric in the piece. There is one brief hint that "the genetically vulnerable" should be advised not to smoke, but race is never mentioned and there are no other remarks that would lead one to identify the article as a "Nazi" piece of scholarship. The brief bibliography (twenty-seven

sources) refers the reader to the work of at least three Jewish scientists (Max Askanazy, Walther Berblinger, and Marx Lipschitz), each of whom is also cited approvingly in the text. This is not as unusual as one might imagine: Jewish scientists from the Weimar period were often cited in Nazi-era medical literature, despite occasional pressures to put an end to the practice.

Also interesting is his discussion of possible causes of lung cancer other than tobacco. Müller was well aware that tobacco was unlikely to be the sole cause, given that a third of his "cases" were either moderate smokers or nonsmokers. He disagreed with the Englishman W. Blair Bell and other "lead therapy" advocates who claimed that the heavy metal showed promise as a cancer treatment (the theory was that lead selectively destroyed cancer cells); Müller's inclination was rather to follow Carly Seyfarth's view that exposed workers—printers, metalworkers, plumbers, painters, and typesetters, for example—actually faced an *increased* risk of contracting the disease. In his own sample of eighty-six men with lung cancer, seventeen showed a history of exposure to lead dust, from which he concluded that inhalation of this heavy metal must be considered a "promoting factor" in the development of cancer. Other factors were no doubt involved, as was suggested by the work history of his cases, which included a forty-eight-year-old locksmith exposed to soot, smoke, and coal dust; a twenty-six-year-old housewife who for two years had worked in a cigarette factory, inhaling tobacco dust; three women who had worked during the First World War in a munitions factory, exposing themselves to nitrates, phosphorous, mercury, chromium, picric acid, and other noxious substances; a forty-eight-year-old dye worker known to have inhaled aniline vapors; and several workers exposed to chromium in one form or another. All smoked only moderately or not at all, leading him to believe that occupational exposures may have played a role in their becoming ill.⁸¹

It is not yet clear what became of Müller, author of the world's first case-control epidemiologic study in the field of tobacco. There is no trace of the man after the war, and it is quite possible that he died on the front, prior even to his thirtieth birthday. We need to know more about how and why this obscure young physician—