21 (1931): 244 ff. The first efforts to induce cancer using tobacco tars seem to have been those of the military physician Anton Brosch of Vienna, who painted guinea pigs with "the well-known carcinogens" tar, paraffin, soot, and tobacco juice, with unclear results; see his "Theoretische und experimentelle Untersuchungen zur Pathogenesis und Histogenesis der malignen Geschwülste," *Archiv für pathologische Anatomie und Physiologie* 162 (1900): 32–84. Otto Schürch and Alfred Winterstein in the early 1930s performed experiments suggesting that tobacco tars induced tumors only in individuals possessing a certain "predisposition"; see their "Experimentelle Untersuchungen zur Frage Tabak und Krebs," *Zeitschrift für Krebsforschung* 42 (1935): 76–92. Victor Mertens in 1930 was apparently the first to conduct experiments to determine whether mice breathing cigarette smoke developed lung cancers (see his "Zigarettenrauch"); he later pointed out that E. von Zebrowski of Kiev in 1908 had exposed rabbits to tobacco smoke to study its health effects, though no mention was made of cancer. See E. von Zebrowski, "Zur Frage vom Einfluss des Tabakrauches auf Tiere," *Centralblatt für allgemeine Pathologie* 19 (1908): 609–17; Victor E. Mertens, "Noch einmal Zigarettenrauch und Lungenkrebs," *Zeitschrift für Krebsforschung* 51 (1941): 183–92.

67. Lickint, "Die Bedeutung," p. 30; also his *Tabakgenuss und Gesundheit*, pp. 84–85. Fr. Thys of the Fondation Médicale Reine Elisabeth in Brussels was another who claimed that too much attention was being given to nicotine and too little to tar in the genesis of lung cancer; see his "Note sur l'étiologie du carcinome bronchique," *Revue belge des sciences médicales* 7 (1935): 640–44. Mertens by 1941 could claim that nicotine was "seldom blamed" for carcinogenesis; see his "Noch einmal Zigarettenrauch," p. 183.

68. Richard Doll, personal communication, October 30, 1996.

69. Neumann Wender, "Eine neue Gefahr für den Raucher," *Münchener medizinische Wochenschrift* 80 (1933): 737–38.

70. Enrico Ferrari, "Tabakrauch und Lungenkarzinom," *Münchener medizinische Wochenschrift* 80 (1933): 942.

71. Klarner, *Vom Rauchen*, p. 22.

72. Rudolf Fleckseder, "Ueber den Bronchialkrebs und einige seiner Entstehungsbedingungen," *Münchener medizinische Wochenschrift* 83 (1936): 1585–88. Aaron Arkin and David H. Wagner in the United States found that 90 percent of their lung cancer patients were heavy smokers; see their "Primary Carcinoma of the Lung," *JAMA* 106 (1936): 587–91. Roffo gave a figure of 95 percent ("Krebserzeugende Tabakwirkung," p. 97). Franz Strnad at Nonnenbruch's clinic in Prague in 1938 found that the proportion was just under 50 percent, and concluded that smoking probably played a role in the onset of the disease; he also observed that the tobacco explanation of the lung cancer rise was "particularly popular among southern Slavic authors"—apparently referring to his colleagues in Prague ("Der Lungenkrebs," p. 309).

73. Franz Hermann Müller, "Tabakmissbrauch und Lungencarcinom," *Zeitschrift für Krebsforschung* 49 (1939): 57–85. A brief abstract of Müller's paper was translated into English and published in the September 30, 1939, issue of *JAMA* (p. 1372).

74. Müller, "Tabakmissbrauch," p. 59.

75. Ibid., p. 57. Walther Reinhard in his "Der primäre Lungenkrebs," *Archiv der Heilkunde* 19 (1878): 385 was one of the first to note this sexual asymmetry (there were 16 male and 11 female lung cancers in his sample); Walter H. Walshe in the fourth edition of his *Practical Treatise on the Diseases of the Lungs* (London: Smith, Elder, 1871) had also noted the inequality. Hans Pässler's 1896 review included 50 men and 18 women ("Ueber das primäre Carcinom der Lunge," p. 246); Adler's 1912 sample of 374 cases was 72 percent male (*Primary Malignant Growths*, p. 22). Seyfarth's 1924 review of 307 cases autopsied at Leipzig's university pathology institute included 258 males ("Lungenkarzinome," p. 1498); for Seyfarth, this sexual asymmetry was "undoubtedly" due to higher male occupational exposures, an attribution curiously at odds with his recognition that tobacco might play a role in the increase of cancer. For Wilhelm Hueper in 1942, by contrast, the discrepancy most likely occurred because men were much heavier smokers (see his *Occupational Tumors*, p. 426); Hueper's conclusion is especially noteworthy given his subsequent distrust of the "cigarette theory."

76. Müller, "Tabakmissbrauch," pp. 62–63.

77. Ibid., p. 78. Müller does not say much about how the healthy controls were chosen; nor does he say why he ignores the female smokers. All 96 individual cases are discussed, however, including details on occupational exposures, age, type and quantity of tobacco smoked, kind and location of lung malignancy, and previous medical history, especially of lung disease.

78. Ibid.

79. Doll and Hill, "Smoking," pp. 739–48.

80. Wynder and Graham, "Tobacco Smoking," p. 329.

81. Müller, "Tabakmissbrauch," pp. 79–82.

82. See, for example, Wynder and Graham, "Tobacco Smoking," pp. 329–36; Richard Doll and A. Bradford Hill, "A Study of the Aetiology of Carcinoma of the Lung," *British Medical Journal* 2 (1952): 1271–86. Willem F. Wassink cited both Lickint and Müller in his "Ontstaansvoorwaarden voor Longkanker," *Nederlands Tijdschrift voor Geneeskunde* 4 (1948): 3732–47.

83. Prof. Berthold Ostertag in 1942 asserted that "the increase of lung tumors among smokers is well known and undisputed" (hinreichend bekannt und unumstritten); he added that it was vital for physicians "to help free tobacco addicts from their addiction." See his "Krebsbekämpfung, Krebsbehandlung," *Medizinische Klinik* 38 (1942): 281; compare Prof. Wolfgang Denk's assertion: "We must reckon with the possibility that the inhalation of *cigarette smoke* has something to do with the extremely high incidence of lung cancer among men," in his "Der Krebs des Mannes," *Wiener klinische Wochenschrift* 56 (1943): 2.

84. Lickint, "Der Bronchialkrebs," pp. 1232–34.

85. De Crinis's remarks, originally published in the *Deutsches Ärzteblatt*, are reported in "Mitteilungen," *Monatsschrift für Krebsbekämpfung* 9 (1941): 197.

86. By "consensus" I mean the dominant or majority opinion, not that everyone agreed. A 1939 article in Germany's journal of continuing medical education conceded that German lung cancer rates had risen to 20–25 times the levels of only two decades previously, but denied that tobacco was the