



## Ethics in Public Health Research

# Tobacco Industry Influence on Science and Scientists in Germany

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Using tobacco industry documents, we examined how and why the tobacco industry sought to influence science and scientists in Germany as a possible factor in explaining the German opposition to stricter tobacco regulation.

Smoking and health research programs were organized both separately by individual tobacco companies and jointly through their German trade organization. An extensive network of scientists and scientific institutions with tobacco industry links was developed. Science was distorted in 5 ways: suppression, dilution, distraction, concealment, and manipulation.

The extent of tobacco industry influence over the scientific establishment in Germany is profound. The industry introduced serious bias that probably influenced scientific and public opinion in Germany. This influence likely undermined efforts to control tobacco use. (*Am J Public Health*. 2005;95:XXX-XXX. doi:10.2105/AJPH.2004.061507)

### IN GERMANY, TOBACCO IS

the single most important cause of illness and premature death, accounting for between 110 000

and 140 000 deaths, or 1.5 million lost life-years, each year.<sup>1-3</sup> Germany has nevertheless been remarkably reluctant to implement effective tobacco regulation and is noted within Europe for its dearth of effective tobacco control policies and its repeated attempts to block the passage of European tobacco legislation.<sup>4-7</sup> The country has been portrayed as the tobacco industry's paradise.<sup>8</sup> Close links between the German government and its powerful tobacco industry have been alleged,<sup>9</sup> and industry journals refer to Germany as "a strong supporter of the tobacco industry."<sup>10</sup> Germany is a major importer of leaf tobacco and exporter of tobacco products, with tobacco accounting for about 1% of Germany's gross domestic product.<sup>11</sup>

The release of internal tobacco industry documents through litigation in the United States allows us to gain further insight into the influence of the tobacco industry in Germany. Two 1998 legal settlements led to the public release of an estimated 40 million pages of previously confidential, internal tobacco industry documents.<sup>12,13</sup> Previous document-based re-

search has shown how the tobacco industry has established and funded a number of research organizations and networks of consulting scientists that purport to fund or undertake independent research.<sup>14-16</sup> Their true purpose, however, has been to produce data favorable to the industry that could be used to refute the scientific consensus on smoking's impact on health, and to influence public opinion, legislation, and litigation.<sup>14,17,18</sup>

Much of the research using tobacco industry documents has so far focused on the efforts of the American tobacco industry, while work on Germany has been limited to a single study revealing what the author termed "shameful science."<sup>19</sup> Our essay builds on and extends this work, in particular by drawing on previously unexplored German-language documents. We examined in detail how and why the tobacco industry sought to influence the German scientific community and their research and thereby the German policy environment. Our essay thus contributes to the debate over the performance, publication, and ethical acceptability of tobacco industry-funded research.<sup>17,20-23</sup>

### METHODS

Under the terms of a 1998 legal settlement with the state of Minnesota, leading tobacco companies were required to make their internal records public in depositories in Minnesota and in Guildford, England. The subsequent Master Settlement Agreement stipulated that, with the exception of British American Tobacco and the Liggett Group, they post their documents on public Web sites.

Industry documents, including confidential letters, reports, statements, and minutes, were identified through online searches of the Legacy Tobacco Documents Library (<http://www.legacy-library.ucsf.edu>) and the Tobacco Documents Online Web site (<http://tobaccodocuments.org>), conducted between June 2003 and September 2004. In contrast to previous work,<sup>19</sup> documents were identified through use of both English- and German-language search terms. An iterative approach was taken that initially used broad search terms to identify documents, which in turn revealed the names of key players, events, and places that could then be used as subsequent



search terms. The initial terms included “German\*,” “scientific,” “Verband” and “VdC” (German Association of Cigarette Industries), and “Forschung\*” and “Rauchen und Gesundheit” and their English equivalents “research\*” and “smoking and health.”

These search terms identified a very large number of documents, so more complex searches using Boolean operators (AND, OR, NOT) were then performed. In total, over 2238 documents were reviewed, including 681 documents identified under the search terms “Forschung\* AND “Rauchen und Gesundheit” (almost all in German). Although searches were not restricted to a specific time frame or tobacco company, documents from RJ Reynolds, Philip Morris, and the Verband der Cigarettenindustrie (VdC, German Association of Cigarette Industries), dated between 1975 and 2002, provided most of the information. All relevant documents were analyzed in detail to construct a historical and thematic narrative. Additional information was obtained from the published literature.

Where the authors have translated documents from German, this is stated. Otherwise, documents are quoted verbatim from the original regardless of the quality of the English.

## RESULTS

### Objectives and Rationale of the Scientific Strategy

The accumulating evidence of the harmful effects of active and, more importantly, passive smok-

ing led the tobacco industry to recognize in the 1970s that research was required to fight the decreasing social acceptability of smoking.<sup>24</sup> The industry began to commission so-called “smoking and health” research from external scientists to help provide greater credibility than was possible through internal industry research.<sup>17,16,25</sup> This “extramural research”<sup>26</sup> took place in several countries, including Germany.<sup>27–30</sup>

Philip Morris documents outline the rationale: that research “should be ‘at arm’s length,’ in order to protect the Industry or individual Companies from litigation.”<sup>25</sup> Reasons for sponsoring such research included “1. To secure scientists who could act as potential experts for Industry, 2. To secure goodwill support on critical issues, 3. To push scientific extremists into isolation, 4. To have work published which is suited to reestablish a balanced view in the scientific community, i.e., defuse critical issues.”<sup>26</sup> Philip Morris also emphasized that “the professional quality of the research scientists,” as well as “the capabilities of the research institution” in which the commissioned work was to be carried out, were important for the “legal effectiveness,” “credibility,” and “bargaining value with authorities” of the industry’s sponsored research.<sup>25</sup>

Contemporaneous to the general strategy was the development of a strategy specific to Germany. A confidential 1976 Philip Morris memorandum explains how the (German) Research Council on Smoking and Health (described in the next section) “is necessary in Germany to be used

as a ‘shield’ by the industry. . . that would be above doubt.”<sup>31</sup> Similarly, in 1979, Frank Colby, scientific director of RJ Reynolds (RJR) USA, described the objectives of RJR’s German smoking and health research program:

To establish relations of mutual trust with leading scientists beyond the grants—as scientific advisors, as a resource to find “witnesses”—if needed—for liability litigations, governmental bodies, etc. as a confidential source of information on the activities of our adversaries, etc. . . To increase the credibility of the Company in its relations with the German Health Ministry and other governmental authorities.<sup>27</sup>

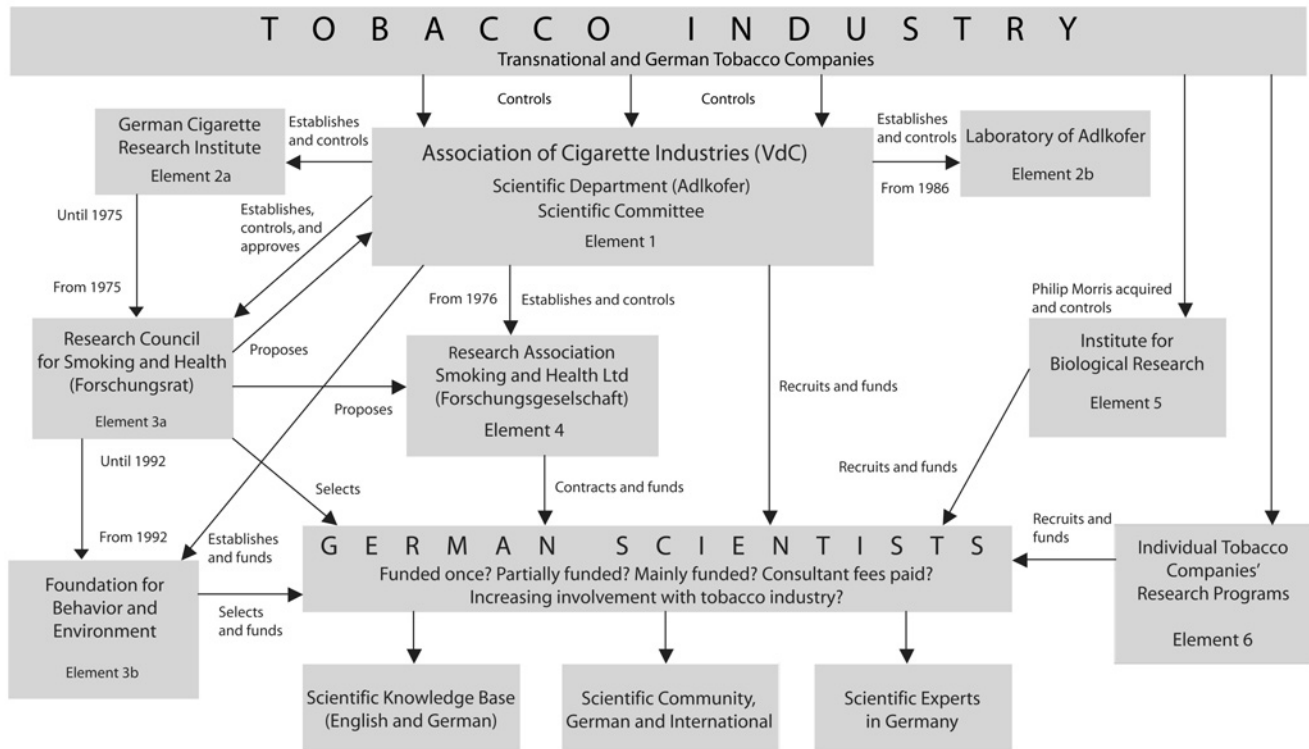
### Structure and Elements of the German Scientific Network

In Germany, the industry’s smoking and health research programs were organized both separately by individual tobacco companies and jointly through their trade organization, the VdC.<sup>32–34</sup> The VdC was founded by several German and transnational tobacco companies to represent company interests on noncompetitive issues; the companies were represented on all relevant VdC committees, including the board. Links between the industry and scientists, which started to develop as early as the 1950s,<sup>19</sup> regained momentum in the 1970s with the development of an extensive network of individual scientists and scientific institutions with links to the tobacco industry.<sup>27,35–39</sup> The documents allow us to distinguish at least 6 elements of this network (Figure 1), many characterized by attempts to obscure their industry links.

*1. Scientific Department and Committee of the VdC.* A key role was played by the Scientific Department of the VdC, headed from the mid-1970s to the 1990s by Franz Adlkofer.<sup>31,40</sup> Adlkofer was also a member of the VdC’s Scientific Committee (Tabakforschungsausschuß), which comprised industry representatives dealing with research projects that transnational and national tobacco companies funded through the VdC. Between 1977 and 1991, the VdC directly funded 110 research projects for a total of more than DM15 million (\$9.2 million).<sup>35</sup> Most dealt with S&H issues, and documents identify many leading German academics as being involved<sup>35</sup> (see Box 1 on page xxxx).

*2. Laboratory of Prof Adlkofer, Munich.* The documents suggest that, having dismantled its German Cigarette Industry Research Institute in 1975 after its head, Walter Dontenwill, published work demonstrating that hamsters inhaling cigarette smoke developed laryngeal tumors,<sup>19</sup> the VdC did not establish another research institute for approximately 10 years. Minutes of a 1986 VdC meeting then note that “the research laboratory of Prof Schievelbein at Munich” was reorganized into the “Laboratory of Prof Adlkofer,” highlighting that “[t]he secrecy of results [from the laboratory] must be warranted.”<sup>36</sup> By the early 1990s, documents reveal direct funding to Adlkofer and his laboratory.<sup>35</sup>

*3. Research Council on Smoking and Health.* After closing down the German Cigarette Industry Research Institute, the member



Note. PM = Philip Morris; RJR = RJ Reynolds.

**FIGURE 1—Structure and elements of the tobacco industry's scientific network in Germany.**

companies of the VdC established the Research Council on Smoking and Health (Forschungsrat Rauchen und Gesundheit, hereafter called the Forschungsrat) in 1975.<sup>37</sup> This supposedly independent organization comprised a council consisting of up to 15 leading German scientists charged with distributing industry funding for research.

The VdC asked Dieter Schmähl of the German Cancer Research Center (Deutsches Krebsforschungszentrum) in Heidelberg to help establish the Forschungsrat.<sup>37</sup> Schmähl selected the members of the first Forschungsrat,<sup>71</sup> generally uni-

versity professors heading a department in a relevant medical speciality,<sup>72–74</sup> and was then elected chairman. Ernst Wynder, whose work contributed to the recognition of tobacco as a public health issue in the United States, but who was controversially courted and funded by Philip Morris,<sup>75</sup> was a corresponding member of the Forschungsrat.<sup>72,76–79</sup> The first Forschungsrat functioned for 3 years (1975–1978) and was reestablished for 3 more periods<sup>80–82</sup> before being transformed into a foundation (VERUM), as described below in this section.

The tobacco industry provided research funds of DM15 million (\$9.2 million) for the period 1975 to 1978,<sup>79,83</sup> DM5 million (\$3.1 million) for 1980 to 1983,<sup>73</sup> and DM8 million (\$4.9 million) for 1987 to 1990.<sup>82</sup> Interestingly, a proposal preventing Forschungsrat members from allocating research projects to their own departments or institutions was rejected at one meeting.<sup>84</sup> Indeed, documents suggest that a significant proportion of funds went to Forschungsrat members or their departments.<sup>85,86</sup> For example, of 30 research proposals approved by the Forschungsrat in February 1976, a total of 23

projects, accounting for 73% of the allocated funding, were either directly led by one of the Forschungsrat members or performed within departments they headed.<sup>85</sup>

The structure and functioning of the Forschungsrat, in particular its relationship with the industry, caused considerable controversy among VdC member companies and the VdC presidency.<sup>76,87,88</sup> On the one hand, the industry wanted the Forschungsrat to be relatively independent, so that research findings advantageous to the tobacco industry would be more credible and influential. On the other hand, some industry



### Box 1—Three Examples of German Scientists Directly Funded by the VdC

One tobacco industry document lists 110 research projects directly funded by the VdC between 1977 and 1991; it names over 60 scientists involved.<sup>35</sup> An RJR employee reports, “These are projects which are ‘contracted’ and which have been handled by the Verband [VdC] since about 1977. . . . The Verband has total control over the design of the experiments, the right of the researchers to publish or not to publish, etc. These projects likewise need to be kept confidential to the outside.”<sup>32</sup>

The documents indicate that between 1982 and 1991, Professor Jürgen von Troschke, head of the Department for Medical Sociology at the Albert-Ludwigs-University in Freiburg and of the German Coordinating Agency for Public Health, undertook several projects on the “psychosocial benefits of smoking.”<sup>41–43</sup> The VdC provided over DM1 million (\$615 000) for these projects.<sup>35</sup> Von Troschke appears to have published the results of these projects in German public health journals without mentioning the source of funding or any conflict of interest.<sup>44,45</sup> Minutes of a VdC meeting in 1991 report that “Prof. v. Troschke has requested approval of further funds (DM 138.000/year) for his smoker motivation study . . . [and] a study on health-relevant lifestyles . . . (DM 146.000 annually for 2 years).”<sup>46</sup>

An industry document gives further reasons for funding his 1991 project: “Prof. Troschke is member of the Government Working Group ‘Cancer Risk Due to Smoking’ in Bonn. He was project leader of several Government projects on smoking. . . . Prof. Troschke speaks for us in the working groups.”<sup>42</sup> Indeed, a 1984 report describes a “presentation by Prof. Von Troschke” at this government working group: “[H]e presented his ideas of psychosocial benefits of smoking; he described smoking as a regularly satisfying experience for the smoker which perhaps might reduce workplace absenteeism. Hence, Prof. Troschke concluded, health information programs for smoker are paradox.”<sup>47</sup>

According to industry documents, Professor Helgo Magnussen, who at the time this article was written was president of the German Association of Pulmonology<sup>48</sup> and medical director of a major pulmonary hospital in Germany (Krankenhaus Großhansdorf, Zentrum für Pneumologie und Thoraxchirurgie, Hamburg), received between 1989 and 1993<sup>35,49</sup> over DM420 000 (\$260 000)<sup>35,50</sup> from the VdC for research projects<sup>51,52</sup> investigating “the influence of passive smoking on the respiratory function in asthmatic subjects.”<sup>53</sup> According to the minutes of a VdC meeting, “He found that passive smoking does not result in any acute reactions of the respiratory tract in patients with bronchial asthma.”<sup>54</sup> A subsequent publication in 1993 mentions support for Magnussen by the Research Association on Smoking and Health Ltd (Forschungsgesellschaft Rauchen und Gesundheit mbH).<sup>55</sup> In contrast, a study published by Magnussen in 2002, funded by the German Federal Ministry for Research and Technology (Bundesministerium für Forschung und Technologie), found that “involuntary tobacco smoke exposure, especially in the workplace, was associated with the prevalence of respiratory symptoms in young adults.”<sup>56</sup> When in 1992 Magnussen was criticized by the media for performing research on children,<sup>57</sup> the VdC offered support.<sup>58</sup>

Documents suggest that Professor Karl Überla, who was head of the Department of Medical Informatics, Biometry and Epidemiology at the Ludwig-Maximilians-University Munich and, from 1981 to 1985, president of the then Federal Health Office (Bundesgesundheitsamt), submitted a research proposal<sup>19,59,60</sup> for “an epidemiologic study on passive smoking to the Forschungsgesellschaft in April 1982.”<sup>61</sup> The VdC seems to have funded this study with almost DM2 million (\$1.2 million)<sup>35,59,62</sup>; first, however, “Professor Überla had to accept the Verband [VdC] position on passive smoking in order to ensure that the findings were not biased against the industry.”<sup>63</sup>

Furthermore, Überla appears to have received subsequent funding from the VdC for several projects.<sup>35,64–68</sup> He appears on the 1990 “Expert Witness Database”<sup>69</sup> (for passive smoking) of Shook, Hardy & Bacon, a US law firm working for Philip Morris. Failing to disclose his links to the tobacco industry, Überla wrote in 1990 to the US Environmental Protection Agency, commenting on 2 passive smoking draft documents: “I am a Professor at the University of Munich and have published papers on passive smoking and lung cancer. . . . Scientists outside the US . . . do generally not agree with the notion, that passive smoking is causally associated with lung cancer. On the contrary . . . all ‘estimations’ of lung cancer deaths per year due to passive smoking are artefacts. . . . The case is open and not closed.”<sup>70</sup>

representatives wanted close control over the Forschungsrat’s activities.<sup>87</sup> However, as the VdC president explained to one tobacco company,<sup>88</sup>

As regards the many proposals you made in order to influence the projects in their details and to exclude scientists who may have been troublesome in the past, . . . We fear . . . that the concept of our Smoking and Health policy would be spoilt if we tried to limit the independence of the Forschungsrat too severely from the start. . . . What we can do at this stage is to take safeguards. . . against uncontrolled publication of results that could give rise to misinterpretation. . . . The presence of Herr Schlenker, former chairman of our Association [VdC], and Dr Schenzer, manager of our Association until recently, in the Forschungsrat will ensure effective industry representation in this body. . . . Moreover, our Association has engaged an eminent young scientist [Franz Adlkofer] whose function it will be to supervise the execution of the research programme in close contact with the scientists and coordinate the work done by the Forschungsrat.<sup>88</sup>

Although the first bylaws implied that the Forschungsrat members would be relatively independent,<sup>78,79</sup> their role appears to have been limited to recommending to the VdC which research should be funded.<sup>78,79</sup> Especially at the beginning, it was the tobacco companies<sup>86,89</sup> or their representatives on the VdC’s Scientific Committee<sup>40</sup> who approved the projects, providing detailed evaluations and rejecting some proposals.<sup>87,90</sup> One research proposal stimulated debate because the scientist heading the project was known to have a



critical attitude toward the tobacco industry.<sup>91</sup>

As suggested in the VdC president's explanation,<sup>88</sup> control over publication of research results was also sought. A proposal that publication rights would rest with the sponsor<sup>78</sup> was not ultimately included in the first set of bylaws,<sup>79</sup> with an industry representative arguing that industry control of publication was already adequate: "the present conception [of the Forschungsrat] has the advantage that the research projects can be influenced to a larger extent and that the VdC can also exert at least an important influence on the publication of research results [quotation translated from the German]."<sup>76</sup>

A number of additional steps were taken to ensure industry control of this "independent" research council. Only the chairman could make public statements on its behalf; members required his permission to do so.<sup>37</sup> Rather than advertising for research proposals, selected scientists were to be informed about funding opportunities.<sup>84</sup> Furthermore, the bylaws guaranteed the attendance of 2 VdC representatives as guests<sup>78</sup> and Adlkofer, director of the VdC's Scientific Department, as an observer.<sup>80,81</sup> The documents suggest that Adlkofer's role extended beyond that of an observer. Attending every meeting, he wrote the minutes<sup>84,92,93</sup> and was referred to<sup>74,78</sup>—and referred to himself<sup>94</sup>—as the Forschungsrat's scientific secretary.

Adlkofer sought to influence debates on tobacco and health outside of Germany. For example,

he wrote in 1990 to the US Environmental Protection Agency to criticize the Draft Report on Passive Smoking, describing himself as toxicologist of the Free University of Berlin and scientific secretary of the Forschungsrat, but he did not reveal his or the Forschungsrat's affiliation with the tobacco industry.<sup>94</sup> He took a similar approach when he wrote to the *British Medical Journal*<sup>95,96</sup> (his letter appears not to have been published) and when writing review articles for German medical journals.<sup>97–99</sup>

In the 1980s, the Forschungsrat became increasingly subject to criticism from individual journalists and scientists for being influenced by the tobacco industry.<sup>73,92,93,100–102</sup> In response, in the early 1990s, the VdC changed the status of the Forschungsrat to a foundation.<sup>103–105</sup> The new name, "VERUM Foundation for Behavior and Environment," did not suggest any connection to the industry or even to smoking. Adlkofer became its scientific and executive director.<sup>106,107</sup>

4. *Research Association on Smoking and Health Ltd (Forschungsgesellschaft Rauchen und Gesundheit mbH [Forschungsgesellschaft]).* In addition to the Forschungsrat, in June 1976 the VdC founded a company, the Research Association on Smoking and Health Ltd,<sup>38</sup> to handle industry research funds by contracting with scientists selected by the Forschungsrat because

they [the VdC] have realized that if this separate institution is handling the research projects an identification of these projects with the Cigarette Associa-

tion [VdC] can be avoided easier than if it would be handled on the basis they had planned in the beginning (projects handled by the Association itself).<sup>108</sup>

The company's model contract describes its close relationship with the scientists it funded:

Performance of the research project will take place in close cooperation with the secretary of the Forschungsrat, Dr Weber [VdC employee and first secretary of the Forschungsrat], and Dr Adlkofer. These gentlemen will, inter alia, ensure that tobacco-scientific knowledge relevant to the research project is put at your disposal. Furthermore, we presuppose that the above-mentioned gentlemen can continuously inform themselves about the research projects, in particular the research methods, the experimental design and the gained interim results as well as the appropriate usage of the research funds, and that they can view all relevant documents [translated from the German].<sup>109</sup>

Later, the VdC also used the Research Association for direct funding of scientists outside the Forschungsrat arrangements.<sup>55</sup>

5. *External scientific institutions funded by individual tobacco companies.* In addition to the scientific institutions funded collaboratively by the industry, individual companies made use of their own institutions. An example is the Institute for Biological Research (Institut für Biologische Forschung [INBIFO]), acquired by Philip Morris in Cologne in 1971. INBIFO aimed to give Philip Morris biological research facilities in the safer European environment, avoiding the risks associated with basing such an institution in the United

States.<sup>39</sup> Once again, the company went to enormous lengths to disguise its involvement.<sup>39</sup> Although the institute was part of a project that went far beyond Germany, the favorable environment and links with the industry's well-developed research infrastructure in Germany were important. Thus, INBIFO conducted experiments whose results helped determine which studies the VdC should support,<sup>39</sup> organized scientific meetings,<sup>110</sup> and provided research grants to scientists in Germany, with documents detailing such activities as recently as 2000.<sup>111</sup>

6. *External scientists recruited and funded by individual tobacco companies.* Some tobacco companies, most notably RJR, also recruited scientists outside the VdC and Forschungsrat arrangements.<sup>27,29</sup> This produced a pool of sympathetic scientists who would support the tobacco industry as a whole on issues of a noncompetitive nature (mainly smoking and health issues) and the individual company on competitive issues such as the introduction of a new tobacco product.<sup>27,112,113</sup> These scientists were often well-known academics. Their collaboration with the industry ranged from accepting a single research grant, to receiving funding for extensive research programs, to collaboration on issues such as planning and performing studies, writing publications,<sup>114,115</sup> or representing a company's interests at the German Federal Health Ministry.<sup>116</sup> Some scientists signed confidentiality agreements and



### Box 2—The Example of Professor Fritz H. Kemper

In the late 1980s, Fritz H. Kemper, director of the Institute for Pharmacology and Toxicology at the University of Münster, acted as scientific advisor and consultant for RJR in connection with the introduction of a new tobacco product in Germany.<sup>113</sup> Internal industry documents provide evidence of the close relationship between Kemper and RJR.

In January 1988, Kemper attended a briefing in the United States to learn about the new product.<sup>113</sup> Afterwards, the RJR executive vice president wrote to Kemper, “Dear Fritz, It was a distinct pleasure having the opportunity to meet you and I enjoyed immensely our dinner session. It was especially encouraging, too, to hear your comments regarding our special project, and we appreciate very much the support you are giving us.”<sup>112</sup> Kemper’s services were covered by a consulting agreement, which included a confidentiality clause; it was signed by RJR and Kemper in 1988:

You agree to make yourself available as a consultant to RJR at the request of the Research and Development Department. . . . During the term of this agreement, you shall refrain from any action or conduct which is inimical or opposed to the interest of RJR. . . . Any information developed by, or disclosed to, you in connection with services performed hereunder whether oral, written or observed while on RJR premises shall be regarded as strictly confidential.<sup>117</sup>

A fee for Kemper of \$1200 per day was agreed upon.<sup>117</sup> A 1988 RJR document shows that he received \$20000 that year.<sup>118</sup> A secret letter<sup>113</sup> from an RJR employee to Kemper gives an example of his tasks: “You have expressed your agreement to sign up [i.e., verify] the scientific documentation on the SPA-related research as a scientist who has been given access to the data and who has evaluated the whole program. You are in agreement that your name will be mentioned in that regard.” The “SPA” project, which involved the development of a new tobacco product that heated tobacco instead of burning it, led to the development of Premier, a “safer cigarette” that RJR claimed was virtually without tar or adverse effects on health.

Kemper agreed to prepare a scientific paper “on the very fundamental pharmacological and other differences between nicotine on the one hand and addictive drugs on the other”<sup>113</sup> to support RJR’s attempt to deny the addictive properties of nicotine. Kemper also acted as an information source for RJR. A document notes that he provided “a list of names of selected people in the German scientific community, which [sic] should be approached and made aware of the new development in the cigarette field by RJR.”<sup>119</sup> Later, Kemper agreed to “handle key scientific briefings on . . . [RJR’s] behalf.”<sup>120</sup> Furthermore, Kemper took part in meetings between RJR and representatives of the Federal Health Ministry.<sup>116</sup>

In 1994, Kemper assisted with another RJR project. In a confidential letter to RJR Germany, he reported making contact with the Federal Health Ministry regarding the new product, and then suggested further strategies: “[M]y advice would be to contact the ‘Koalition gegen das Rauchen’ [Coalition Against Smoking], in which several high ranked institutions are combined. . . . Moreover contacts to single persons with high scientific and/or political reputations should be looked for; here I shall be of assistance.”<sup>121</sup>

received significant consulting fees directly from the tobacco company.<sup>117,118</sup> An example is Fritz Kemper (see Box 2 on page xxx).

Other documents refer to a consultancy and confidentiality agreement<sup>122</sup> in 2001 mentioning Hans Marquardt, former head of the Department of Toxicology at the University Hospital Eppendorf (Hamburg), whose contacts with Philip Morris date from 1983.<sup>123,124</sup> Available documents include an unsigned draft confidentiality agreement with Marquardt<sup>122</sup> regarding his membership on the “Scientific Advisory Board” of the “Philip Morris External Research Program.”<sup>125</sup>

Another document, which reports on payments to this advisory board, lists \$13 816 as being paid to Marquardt in 2001.<sup>126</sup> In 1997, both Kemper and Marquardt were appointed by the European Commission to its scientific committees,<sup>127,128</sup> and at least as recently as October 2004 they remained members

of the commission’s reserve list of experts.<sup>129</sup>

Frank Colby, scientific director of RJR, sought to recruit high-level scientists in Germany for RJR’s external research program.<sup>27,29,30,114,130,131</sup> Between 1977 and 1979, RJR funded 9 projects involving 10 leading scientists.<sup>27,132–134</sup> Funding for this part of RJR’s research program was substantial: a total of \$750 000 for the period 1977 to 1979 and a recommendation for approximately \$450 000 per annum from 1980 to 1982.<sup>27</sup> The documents also indicate that Germany was RJR’s most important research base outside the United States, with its contacts there much more advanced than elsewhere in Europe, although consideration was being given to extending the work elsewhere.<sup>27,29</sup>

Colby appears to have selected scientists according to a number of criteria: (1) whether their work was of interest to the industry, (2) whether their attitude was generally positive toward smoking, (3) whether the scientist had sufficient doubts about the harmful effects of smoking, (4) their age, and (5) whether they had contact with influential figures, particularly in the government or media or through membership in national or international scientific bodies.<sup>27,29,131,135</sup> For example, Colby felt that contact with Helmut Schievelbein, then head of the Institute for Clinical Chemistry at the German Heart Center in Munich,<sup>136</sup> was probably worth maintaining because “he is frequently queried by the German Government, other scientists, and



journalists regarding passive smoking.<sup>29</sup>

The key step in recruitment was to suggest that scientists submit a research proposal. While this was reasonably straightforward for sympathetic scientists,<sup>135</sup> Colby encouraged more skeptical ones to submit proposals that did not necessarily concern smoking,<sup>30</sup> as in the case of a leading academic from Hamburg,<sup>137–142</sup> and reassured them of their academic independence.<sup>114</sup> In persuading one researcher<sup>114</sup> to submit a proposal,<sup>130</sup> Colby reported, “he was obviously sceptical regarding my motivation as a Tobacco Industry scientist. I made it very clear to him that once we agreed on a scientifically impeccable design of experiments and other project parameters, he, like other scientists which we are sponsoring, would have complete ‘freedom’ regarding the results and their publication.”<sup>114</sup> This researcher, well-known for his work in health promotion, was reassured on this point and eventually did submit a successful application in 1981.<sup>143,144</sup>

### Methods of Distorting Science

The evidence presented thus far suggests that tobacco-related scientific output in Germany was heavily influenced by the tobacco industry.<sup>29,76,88,109,131,135</sup> Additional documents outline how this influence worked in practice. Taken together, they allow identification of the following 5 methods for influencing scientific knowledge.

**Suppression.** Just as the VdC closed the German Industry Research Institute when its head published results unfavorable to the industry,<sup>19</sup> so it aimed to suppress the dissemination of unfavorable results.<sup>115,145,146</sup> Documents report how data on the co-carcinogenicity of nicotine was to be kept confidential.<sup>145</sup> They also reveal that the VdC would “hide” some of its tumor studies<sup>146</sup> and that Adlkofer, examining the effect of “sidestream smoke” (i.e., passive smoking) on animals, “*guaranteed the results of the study will not be published [emphasis in original].*”<sup>115</sup> Conversely, the industry encouraged the publication of favorable findings.<sup>30</sup>

**Dilution.** The selective funding of research and the recruitment of scientists who had doubts about the adverse health effects of smoking, or whose previous work had found no links, led to the funding of research projects designed to find no association between smoking and disease.<sup>30,131</sup> This probably caused dilution of genuine studies, introducing severe bias into the evidence base, especially when meta-analyses were later undertaken.

**Distraction.** The industry selected and supported a large number of research projects that aimed to distract attention from smoking by investigating other potential causes of smoking-related diseases<sup>131</sup>—so-called “confounder studies.” Research focused, for example, on psychosomatic aspects of and familial and genetic links to tobacco-related diseases. Studies asked whether chronic respiratory diseases and the desire to smoke

had a common psychogenic origin, such that “any alleged statistical associations between smoking and certain changes in respiratory parameters may (or may not) be coincidental rather than causal.”<sup>27,131</sup>

**Concealment.** It seems that in order to increase the credibility and impact of the studies presented, whenever possible, favorable scientific results were presented and published by a “third party”—a scientist whose connection to the industry could be hidden,<sup>115</sup> with the industry’s involvement often actively concealed.<sup>114,131</sup> For example, a study showing changes in lung cancer patients that were independent of smoking habits was published without mentioning RJR’s financial support.<sup>114,147</sup> A confidential Philip Morris document from 1983 states, “Franz Adlkofer and Dr [Gerhard] Scherer of the VdC have written an extensive article on passive smoking, which will be published under Schievelbein’s name.”<sup>115</sup> When a researcher<sup>133,134</sup> mentioned the RJR funding for his project in a publication, Colby wrote to him, “please remember that the contract indicates that we prefer that we be consulted regarding such mentioning before a paper is sent out to a journal or other publisher.”<sup>148</sup>

**Manipulation.** Some articles and presentations were vetted by the industry before publication or presentation. A Philip Morris document reports, “The VdC has influenced Dr Schmähl and his group to speak out against a poor publication which is hurting the industry. . . . The VdC is also influ-

encing publications which will be presented at the Fourth World Health Conference that deals with the cost to the economy because of smoking.”<sup>146</sup> Colby reported in 1980, “Prof [Wolfgang] Jacob had been invited to give the keynote address at the Anti-Smoking World Health Day in Germany. Although Prof JACOB believes. . . that cigarette smoking allegedly causes lung cancer. . . he expressed some scepticism regarding. . . [this] point of view in the draft of the speech which he sent to us prior to delivery. Some changes in this are described in the attached letter.”<sup>114</sup>

### DISCUSSION

Tobacco document research is fraught with difficulties, most notably that of ensuring that searches identify all relevant documents, particularly given inconsistencies in indexing.<sup>149</sup> Although our search sought to be comprehensive, it is likely that because of problems with the coding and indexing of documents, particularly those in languages other than English, we have discovered only part of the total. This is particularly the case since the Internet documents cover only some of the companies operating in Germany, with British American Tobacco largely excluded.

The extent of industry influence over the scientific and medical establishment in Germany revealed in this essay is profound and, we suggest, greater than that documented in many other countries. The documents show, for example, that



RJR had a far larger scientific network in Germany than elsewhere in Europe.<sup>27,29</sup> Industry influence, established in the 1950s,<sup>19</sup> has become deeply embedded over the years, extending through a large network of institutions and individuals, with documentary evidence that this continued until at least 2002.<sup>125</sup> The documents obtained identify about 60 scientists who received industry funding between 1975 and 1991 from the VdC or RJR alone.<sup>27,29,30,35,114,130,131,135</sup> However, this number is likely to be only a fraction of those who accepted funding, either through these organizations or through the *Forschungsrat*, INBIFO, and other tobacco companies. Many were eminent scientists based in some of the leading German universities and with the potential to play a key role in policy development.

According to industry documents, for example, Schievelbein of the German Heart Center in Munich, who appears to have received funding from the VdC,<sup>35</sup> was also separately approached by RJR because of his links with the German government and journalists.<sup>29,136</sup> Wolfgang Jacob of the University Heidelberg was the German representative on the World Health Organization committee assigned to standardize cancer pathology; documents indicate that he was not only funded by RJR<sup>27,30,114</sup> but had his World No Smoking Day keynote address changed by the industry.<sup>114,150</sup> Others who appear to have received funding from the VdC include Helgo Magnussen,<sup>35</sup> president of the

German Association of Pulmonology<sup>48</sup> until the end of 2004, and Karl Überla,<sup>35</sup> who was president of the then Federal Health Office (*Bundesgesundheitsamt*).<sup>19</sup> Moreover, leading German academics paid as tobacco industry consultants continue as official advisers to the European Commission.<sup>127–129</sup> The sums of money involved were also substantial; for example, over \$9.0 million was allocated by VdC between 1977 and 1991,<sup>35</sup> over \$18.1 million by *Forschungsrat* between 1975 and 1990,<sup>79,83,73,82</sup> and approximately \$450 000 per annum made available by RJR in the early 1980s.<sup>27</sup>

The sheer number of scientists collaborating with the tobacco industry and, in some cases, the intensity of their involvement are remarkable. While there were many scientists who received only small amounts of funds, many others became deeply involved with the tobacco industry, which begs the question of how this was achieved.

There appear to be a number of reasons. First, it is apparent that some scientists (especially those whose links to the industry were in the 1970s or perhaps even the 1980s) did not realize the implications of accepting this funding, or that they would be working within a system so tightly controlled by an industry that was assuring them—often falsely—that they would have full independence. This is illustrated by the letter of a scientist who did not receive a reply from the industry to his research proposal. Years later, he wrote to Adlkofer, “Retrospectively, I am even grate-

ful to you, that you never came back to me. . . since through this I did not load my conscience. . . with the burden of accepting research funding that I would regret today [translated from the German].”<sup>151</sup> Second, not only in Germany, but internationally, it was far more acceptable in the 1960s and 1970s to accept tobacco industry funding.<sup>152</sup> However, although the scientific community elsewhere has now rejected tobacco industry funding and sought to mitigate its influence on science, Germany so far appears to have failed to do so.

Third, there is no agreed ethical code in Germany to guide scientists in their relationship to the tobacco industry.<sup>8</sup> Elsewhere, criticism of those receiving tobacco industry funds has become more vociferous.<sup>23,153,154</sup> Although internationally many universities continue to receive industry funds,<sup>155,156</sup> a growing number of institutions are prohibiting this practice,<sup>156,157</sup> and funding agencies are refusing to give financial support to researchers or institutions that receive industry funding.<sup>156,157</sup> In the United Kingdom, a good-practice protocol has just been signed and a code of practice on tobacco industry funding to universities has been released.<sup>158,159</sup>

Finding the scientific truth was not the aim of the tobacco industry. Instead, it sought to manipulate and distort the evidence. The documents suggest it achieved this through the selective recruitment and funding of scientists and projects likely to produce favorable results, the suppression of unfavorable find-

ings, the promotion of favorable findings, and the promulgation of alternative explanations for diseases associated with tobacco use. Importantly, major and often complex efforts were made to hide industry links at each stage of the process—from recruitment to publication. However, when RJR directly approached researchers, it attempted to reassure them of their “complete ‘freedom’ regarding the results and their publication,”<sup>114</sup> something that other documents suggest was far from likely.

The evidence presented in this essay suggests that the industry introduced serious bias into published research that probably influenced scientific consensus and public opinion in Germany. This is likely to have increased the social acceptability of smoking, influenced the policy context, and undermined efforts to control tobacco use, just as the industry desired. Our findings suggest that the influence of the tobacco industry on science and scientists in Germany may be an important factor in explaining the opposition of Germany’s health policymakers to stricter tobacco regulation.

Thus, in surveys of German public opinion conducted within the European Union, the level of support for a ban on smoking in public places, a policy now being enacted in other European countries, is among the lowest.<sup>160</sup> Within the European Union, Germany’s smoking rates among men are exceeded only by those of Greece and some of the central and eastern European countries that joined the European





Union in 2004, while it has the highest smoking rates among women.<sup>161</sup> Germany's ability to block action within the European Union, as well as the need for a common European position in global discussions and the role of German advisors on international committees, means that its decisions have an impact far beyond Germany's borders.

The issue of publication is more complex. Although some journals now refuse to take tobacco industry-funded research, others believe this is too great a step and that disclosure of interests is a better approach.<sup>21,22,156</sup> Both approaches, but particularly the latter, are compromised by evidence that the industry often insists that its funding be hidden<sup>114,147,148</sup> or concealed behind a third, supposedly independent party such as the Forschungsrat or its recent metamorphosis, VERUM.

Our findings suggest that a number of important steps must be taken if the scientific and policy environment in Germany is to change. Organizations such as the Forschungsrat and VERUM must be added to the growing list of known industry front groups so that editors and peer reviewers are aware of the true source of funding. Universities and academics in Germany should be encouraged to review their approach to tobacco industry funding and adopt a code similar to that just produced in the United Kingdom.<sup>158</sup> German funding bodies should consider refusing to cofund those also receiving tobacco industry funds. Many of the German scientists involved with the to-

bacco industry have a medical background and are therefore members of a medical chamber (Ärztchamber). The Federal Medical Chamber (Bundesärztekammer) has taken a position against smoking on several occasions and could be encouraged to include a policy on tobacco industry support in its Professional Code of Practice (Berufsordnung).<sup>162</sup> Both German and international academic journals should review their policies on accepting tobacco-funded research and the need for disclosure statements.

Finally, our findings suggest that when "scientific experts" are being selected or relied upon for advising official bodies on tobacco-related issues, a cautious approach and a more exacting conflict of interest policy is needed in Germany. ■

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#### Contributors

T. Grüning and A.B. Gilmore developed the idea for this study. T. Grüning performed the document searches, analyzed the evidence found, and wrote the first draft. All authors contributed to data interpretation and to the preparation and writing of the article, and they saw and approved the final version.

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