

# Commentary: Lung cancer and tobacco consumption

Sir Richard Doll

The issue of *Zeitschrift für Krebsforschung* in which Schairer and Schöniger's<sup>1</sup> paper appeared did not reach Britain during the war (although most other issues did) and it is still not held by many libraries and was not indexed in the cumulative medical index. It is understandable, therefore, that it was not mentioned at the conference held by the Medical Research Council in 1947 to discuss the reasons for the increase in mortality attributed to lung cancer (Hill, personal communication) and was not referred to when Hill and I published our first paper on the association between cigarette smoking and lung cancer,<sup>2</sup> although we did refer to Müller's paper that had been published in 1939.<sup>3</sup> Schairer and Schöniger's paper came to the attention of British research workers sometime in the next 2 years and was listed as one among several papers that had previously reported an association between smoking and lung cancer in the final report of our case-control study<sup>4</sup> and it was subsequently noted regularly in reviews of the subject on both sides of the Atlantic. In Germany it received a mixed reception. It was mentioned by Bauer<sup>5</sup> in his textbook on cancer (though its conclusions were not endorsed) and was accepted in East Germany by Lickint<sup>6</sup> who had long been convinced of the hazards of smoking. In West Germany, however, interest in the effects of smoking waned, as a reaction to the anti-smoking policies of the Nazi government, and it came to be ignored. It has consequently never been properly reviewed and its conclusions not emphasized until Davey Smith, Ströbele and Egger drew attention to it 50 years later in an article on Nazi medicine in the *Journal of Epidemiology and Community Health* in 1994.<sup>7</sup>

Judged by modern standards of epidemiology Schairer and Schöniger's work fails on several grounds: (1) the small number of cases of lung cancer (93 men and 16 women), (2) the use of surrogate informants for the patients who had died from cancer and living informants for information about themselves for the controls, (3) the low response rate to the questionnaires about the cancer patients (53% for those with lung cancer, 40–60% for those with cancers of the tongue, oesophagus, stomach, colon, and prostate, and an even lower rate [39%] for the controls) and (4) the use of controls in only one narrow age group (53–54 years) selected to correspond with the average age of the lung cancer patients (53.9 years).

The epidemiology of non-communicable diseases was, however, in its infancy at the time and it would be unfair to the authors to judge their work in this way. However, it should be noted that much higher standards had already been set in a few studies, notably in the UK by Lane-Clayton<sup>8</sup> in her study of 500 cases of breast cancer and 500 controls and by Stocks and Karn<sup>9</sup> in their study of the diet of 462 patients with a variety of cancers

and 435 controls, and in the US by English *et al.*<sup>10</sup> in their study of smoking and myocardial infarction.

The strength of Schairer and Schöniger's study lay in the fact that they compared their findings for people who had died from lung cancer with those for people who had died from other types of cancer, principally stomach cancer (then the most prevalent type of fatal cancer in Germany, as it was in most of the developed world), as well as with their findings for healthy controls. Its value lies principally in their perceptive discussion of the meaning of their findings.

They noted the great differences they recorded in the proportions of heavy smokers and of non-smokers in their lung cancer patients compared with those recorded for gastric cancer and control subjects and the similarity of their results with those obtained earlier by Müller<sup>3</sup> (whose findings had stimulated their enquiry). They also highlighted the increase in the frequency with which lung cancer had occurred over the previous 20 years, its correspondence with the increased use of tobacco, the greater frequency of the disease in men than in women (corresponding to the sex difference in smoking), the successful induction of cancer on the skin of animals by the application of tobacco tar by Roffo<sup>11</sup> and the presence in such tar of 'the strongly carcinogenic benzpyrene'. When all these pieces of evidence were combined Schairer and Schöniger thought the total evidence made a strong case for causality, particularly as they were able to cite several reasons (*q.v.*) for thinking that occupation, combustion engines and city life could not account for the findings. Their list of evidence, it may be noted, includes most of the types described later by Hill<sup>12</sup> as guidelines that could be used to determine causality.

One piece of the evidence would, however, have been disputed in the UK, for the temperature at which Roffo burnt his tobacco was greater than the temperature at which tobacco is burnt in normal smoking and, although Kennaway's colleagues eventually showed that benzo(a)pyrene was present in normal tobacco smoke in small amounts<sup>13</sup> and Wynder *et al.*<sup>14</sup> showed that cancers could be produced on the skin of animals by prolonged painting with tars produced at the appropriate temperature, Roffo's experiments should not have been cited as biological evidence of the plausibility of a causal relationship.

Schairer and Schöniger realized the weaknesses in their study and noted that the proportion of non-smokers in their comparison groups were suspiciously high and that the low response rate in the controls might have biased the results; heavy smokers in particular having refrained from replying. Although these considerations should not, they thought, have applied to the other cancer comparison groups. Stomach cancer patients, however, might have suffered from a 'weak stomach' for some time and consequently refrained from heavy smoking. They recognized that their comparison material was 'less than satisfactory' and reached the cautious conclusion that 'the association between heavy

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tobacco consumption and lung cancer is therefore statistically, and causally, only likely' and that 'larger investigations are required'.

Schairer and Schöniger's article marks an important phase in the development of knowledge about the harmful effects of tobacco and has, until now, failed to receive the recognition that it deserves. It would be wrong, however, to suggest that it proved, beyond reasonable doubt, that smoking was an important cause of the disease, a conclusion that the authors themselves never claimed.

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# Commentary: Schairer and Schöniger's forgotten tobacco epidemiology and the Nazi quest for racial purity

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It is important to see Schairer and Schöniger's paper against a backdrop of the history of tobacco, the history of cancer, and the history of how a causal link between the two came to be recognized. Schairer and Schöniger's paper also has to be seen, though, as a political document, a product of the Nazi ideological focus on tobacco as a corrupting force whose elimination would serve the cause of 'racial hygiene'. Nazi Germany was governed by a health-conscious political elite bent on European conquest and genocidal extermination, and tobacco at this time was viewed as one among many 'threats' to the health of the chosen Volk.

Exploring this larger political context in this sense tells us something interesting about the nature of the Nazi regime. Nazism was a movement of muscular, health-conscious young men worried about things like the influence of Jews in German culture and the evils of communism, but also about the injurious effects of white bread, asbestos and artificial food dyes. Hitler himself was a vegetarian and did not smoke or drink; Nazi anti-tobacco activists often pointed out that while the three leading fascist leaders of Europe all abstained from tobacco (Mussolini, Franco, and Hitler), the three leading Allied leaders (Churchill, Roosevelt and Stalin) were all heavy users.<sup>1</sup>

## Cancer rates on the rise

Tobacco use skyrocketed at the end of the nineteenth century, following the invention of safety matches (in 1852), the rise of mass consumer marketing, and the invention of the Bonsack cigarette rolling machine (in 1884), which allowed industrial-scale production. Cigarettes were given to soldiers in the First World War, creating an entirely new generation of addicts; national governments also found in tobacco a marvellous source of income, since sales were easily regulated and effectively taxed. Cigarettes became the preferred mode of smoking toward the end of the century, following the development of 'flue-curing,' a fermentation process that allowed tobacco smoke to be inhaled without coughing. Cigarettes were also more easily packaged and carried than other kinds of tobacco—the pre-packaged white casings being interestingly similar in this regard to the prepackaged ammunition cartridges invented about this time, with comparable deadly effects.

As a result of the rapid growth of cigarette consumption, cancer rates rose explosively in the first decades of the twentieth century. Lung cancer had been an extremely rare disease prior to 1900—with only 140 documented cases worldwide<sup>2</sup>—though by the 1930s the disease was the number two cause of cancer death among males in Germany, second only to stomach malignancies.<sup>3</sup>

A 1944 study would show that lung cancer had actually surpassed stomach tumours to become the leading cause of cancer death among soldiers in the German army, a result not inconsistent, in this military man's view, with a tobacco aetiology.<sup>4</sup>

Though German pathologists in the 1920s were among the first to recognize the reality of a lung cancer epidemic,<sup>5</sup> cigarettes were not widely blamed until the 1930s. Cigarettes had occasionally come under suspicion (not before 1900, interestingly), but the more common view held that road tar or car exhaust or the flu epidemic of 1919 or even racial mixing or the chemical warfare agents used in World War I were the primary culprits. There were some stragglers who thought that the entire phenomenon might be a statistical artefact of either better diagnosis (notably by X-rays, but also improved bronchoscopy) or more extensive hospitalization, but by the late 1920s pathology institutes in the German-speaking world had mortality statistics reliable enough to show that the *Lungenkrebs* epidemic was real, and accelerating.

Fritz Lickint of Dresden published the first good statistical evidence of a lung cancer tobacco link in 1929, based on a case series showing that lung cancer sufferers were likely to be smokers. Lickint also argued that tobacco use was the best way to explain the fact that lung cancer struck men four or five times more often than women (since women smoked much less) and that in countries where women also smoked, the sex difference was much smaller.<sup>6</sup>

Adam Syrek in 1932 at the University of Cracau argued similarly that it was hard to reconcile a non-tobacco aetiology with the mortality patterns he was finding in rural Poland. Syrek showed that many of the lung cancer deaths recorded at his institute were from rural areas, where cigarette smoking had become popular and polluting industries were virtually nonexistent. Syrek also showed that the epidemic had struck Cracau itself, where there were still very few cars and little industry to speak of. The flu epidemic was also an unlikely cause, in his view, since both sexes were equally afflicted by flu. By a process of elimination, Syrek came to the conclusion that tobacco was the most likely cause of the epidemic.<sup>7</sup>

## The Nazi impulse

The rise of the Nazi regime to power in January 1933 produced several major transformations in German science. Many areas of science with strong Jewish representation—psychoanalysis and certain areas of theoretical physics, for example—lost many of their leading lights, though other fields, with relatively few Jews, fared better. Sciences that could be regarded as free of Jewish influence, or as useful to the military or racial goals of the regime, were often encouraged.

Prevention-oriented cancer research was one such area. Part of this had to do with the 'homeopathic paranoia' of the regime (my term)—the fear that small but powerful agents were undermining the German *Volkskörper*. The carcinogenic effects of food dyes became a focus of considerable interest, as did the radiogenic lung carcinomas of uranium miners (the so-called 'Schneeberger' or 'Joachimstaler Krankheit,' caused by exposure to radon gas in the *Erzgebirge* of southeast Germany and the German-Czech border), the perils of mercury dental fillings, and the carcinogenic impact of asbestos. By 1939, for example, occupational authorities were routinely listing lung cancer as one of the occupational hazards of exposure to asbestos dust.<sup>8</sup>

There was a great deal of worry about how to maintain the 'purity' of Germany's food, air and water, a concern linked ideologically to the more notorious (and eventually criminal) efforts to eliminate 'foreign racial elements' from the German population.

This quest for bodily purity was not unique to Nazi Germany, of course—think of the eugenic fervour of some of America's early natural food advocates or even the post-World War II fear of fluoridation, captured dramatically in a remarkable sequence in Stanley Kubrick's film, *Dr Strangelove*, which has a Cold War-era general obsessing over threats to his 'precious bodily fluids'. The Nazis carried this quest further than other contemporary nations, prompting them to engage in certain areas of cancer research that from today's vantage point look surprisingly progressive. This becomes particularly clear if you look at the source of support for Schairer and Schöniger's research.

## Astel's institute

Schairer and Schöniger's case-control epidemiological study was financed by Karl Astel's Institute for Tobacco Hazards Research (or 'Institute for the Struggle Against Tobacco Hazards', as it was also known), established in 1941 at Jena University by a 100 000 Reichsmarks grant from Hitler's Reich Chancellery. We do not know who first suggested the study, though it could well have been Prof. Dr. med. Astel himself, who ruled over much of this intellectual territory with the iron hand expected from a Nazi *Führer*. Astel was a high-ranking SS officer and from 1939 president of the University of Jena; he was also an ardent anti-Semite and euthanasia advocate who served as head of Thuringia's Office of Racial Affairs, an important instrument in the propagation of Nazi political ideals.

Astel was an early devotee of Hitler, having already marched alongside his beloved Führer in September 1923 at a Nuremberg rally, earning him the coveted Nazi 'Golden Badge of Honor,' awarded to the first 100 000 people to join the Nationalsozialistische Deutsche Arbeiterpartei (NSDAP) (more than ten million people eventually joined the Party). Astel was also a rabid anti-tobacco activist, who quickly made a name for himself on the Jena campus by snatching cigarettes from the mouths of smoking students. His institute therefore, not surprisingly, sought to combine both scientific and propagandist work. The institute purchased and distributed 2000 copies of Hans FK Günther's 8-page *Trinken, Rauchen, Gattenwahl* (Drinking, Smoking, and Spousal Choice) along with 15 copies of Lickint's *Tabak und Organismus* (at 50 RM each), hundreds of reprints from *Reine Luft* (Pure Air), the most important anti-tobacco journal of the era, and 3000 copies of Emil Skramlik's compilation of Goethe's views on tobacco. Skramlik also received at least 15 000 RM to produce an anti-tobacco film (*Genussmittel Tabak*)—and though much of it was apparently finished by 1944, the film itself has since disappeared. Skramlik went on to become president of the University of Jena after the war, succeeding Astel, who shot himself in the University Medical Clinic in April of 1945, after apparently destroying all his files.

Schairer and Schöniger's paper was largely based on Schöniger's medical dissertation, submitted in 1944. Schöniger's, though, was only one of several dissertations produced at Astel's institute. Gabriele Schulze and Käte Dischner in their jointly written *Die Zigarettenraucherin* ('The Female Cigarette Smoker', Jena, 1942), for example, interviewed 165 women as

part of a study of the physical and psychological effects of nicotine withdrawal. Most of the women studied were incarcerated at prisons in Weimar, Gera or Kleinmuesdorf near Leipzig, where smoking was forbidden; the dissertation records the women's cries for cigarettes, and attempts to classify female smokers by menstrual patterns, 'constitutional type' (asthenic, pyknic, leptosome, etc.), and criminal behaviour. The authors claimed that smoking made one vulnerable to tuberculosis and called for a total smoking ban for women, consistent with the Nazi slogan 'Die deutsche Frau raucht nicht!' (The German woman does not smoke!).

Racial hygienists distinguished 'positive', 'negative' and 'preventive' racial hygiene, encompassing: (1) encouragement of breeding among the 'fit' (e.g. by marital loans and prizes for large families); (2) limitation of breeding among the 'unfit' (especially by sterilization); and (3) prevention of exposure to genotoxic hazards. For Astel, preventive racial hygiene translated into a research effort to determine whether nicotine was a mutagen, in accordance with his view that 'We cannot change our genes, but at least we can safeguard them from future damage.'<sup>9</sup>

Astel therefore funded inquiries into whether nicotine or other constituents of tobacco smoke could be considered mutagens. The racial theorist Günther Just of Würzburg's Rassenbiologisches Institut was appointed a 'Mitarbeiter' at the tobacco institute in March of 1943, and over the next 2 years received 6000 RM to explore the genetic and hormonal damage caused by nicotine. The pharmacologist Gustav Kuschinsky of Prague received a total of 17 444 RM that same year from Astel's institute, to conduct a series of rat experiments to prove (with Karl Thums of Prague) that smoking caused heritable genetic damage. Kuschinsky was still doing work on this project (without success) as late as September 1944; he also worked for the Reemtsma tobacco company after the war, doing similar work.

The Nazi government enacted numerous legal sanctions limiting tobacco use. Tobacco was banned in theatres and cinemas, and on buses and in many public buildings. Astel implemented the nation's first (modern) university tobacco ban, and smoking was barred in post offices, military hospitals, and all Nazi party offices. Rationing was implemented at the outbreak of the campaign against Poland, making it hard even for Astel's institute to obtain tobacco for research purposes. In 1942, for example, Astel had to ask his anti-tobacco comrade, Reich Health Führer Leonardo Conti, for help in obtaining adequate supplies.

One reason tobacco was in short supply was that tobacco was used to finance the war. In September 1942 a war tax nearly doubled the price of cigarettes, which when coupled with agricultural shortages and the impoverishment late in the war caused a drastic drop in the number of cigarettes smoked in Germany. Per capita cigarette consumption fell *by half* from 1940 to 1950, whereas in the US, per capita consumption *doubled* over the same period.

Hitler in 1942 said that he regretted having given his soldiers tobacco at the start of the war. And though the decision was clearly a pragmatic one, the power of tobacco manufacturers at this time should not be underestimated. The industry had strong friends in the ministries of economics and finance, both of which were clearly afraid of interrupting the steady flow of cash from tobacco taxes, which in 1941 accounted for one twelfth(!) of all revenues flowing into the national treasury. Anti-tobacco activists often lamented the financial clout of the industry, as we can see from the following passage in a letter

of 21 April 1941, from Fritz Lickint to Astel, celebrating the founding of the anti-tobacco institute:

*Finally it will be possible to establish a true bulwark against efforts by the heretofore omnipotent 'tobacco interests' to monopolize tobacco research. Finally it will be possible to counter the impression, created by the industry's research institutes in Vienna and Forchheim, that they alone have the right to speak the truth about tobacco, and to shape or even dominate public opinion concerning matters of tobacco.*

The industry's voice was not so easily countered, however. Shortly after the founding of Astel's institute, the industry established its own information organ, the 'Tabacologia medicinalis,' in a clear attempt to win the tobacco-health propaganda war. Leonardo Conti ordered the closing of the organization shortly thereafter, but it is possible to see this as the beginning of a new kind of clash that would re-emerge in America in the mid-1950s, with the formation of the Tobacco Institute and the Council for Tobacco Research, bodies skilfully designed to counter the evidence of a global tobacco health catastrophe.

It was not the power of the tobacco industry that crushed Astel's institute, but rather the defeat of Germany's armies. The institute came to an end in the spring of 1945, when Astel committed suicide, recognizing his future in a post-Nazi world would not be a pleasant one. Astel had helped to organize the euthanasia operation that murdered some 200 000 mentally and physically disabled; he had also assisted in the 'Final Solution of the Jewish Question' as head of the Thuringia's Office of Racial Affairs. Had he managed to survive the war, he most likely would have been tried as a war criminal. Astel had also made the Jena medical faculty a hotbed of Nazi activism—some instances of which can be seen in the highly questionable research promulgated under his reign.

The Waffen-SS physician Erich Wagner, for example, had done his notorious dissertation on classifying tattoos among the concentration camp inmates of Buchenwald under Astel's tutelage; Wagner committed suicide in 1959, when a court in Offenburg began legal proceedings against him for murder.<sup>10</sup> Members of the Jena medical faculty had done other work at Buchenwald, some of which utilized their tobacco expertise. Friedrich Timm of Jena's Institute for Forensic Medicine, for example, autopsied the body of an SS Hauptscharführer by the name of Rudolf Köhler, who had died while interned in the camp on suspicion of corruption; Timm concluded that the man had committed suicide by ingesting a 'large quantity of cigarette butts'. Astel's institute also entertained proposals to study how racial mixing, tobacco use, and 'exploitation by Jewish capital interests' affected the health of people living in tobacco-growing regions. Tobacco in the words of the author of this proposal was to be classified not as a *Lebensmittel* (food) but rather as a *Sterbemittel* (death agent).

Some of the institute's work involved human experiments. The radiologist Wolf Dietrich von Keiser on 6 November 1941, for example, wrote to Astel, asking for his assistance in procuring 400 stormtroopers for a series of experiments to determine the effects of nicotine on gastric function. The subjects were required to appear for 2 days in Keiser's surgical clinic at the University of Jena; one day they were fed nicotine, the other they were not. The men were then X-rayed to determine effects on the stomach. Human experiments were also carried out on prisoners, and there was a fair amount of animal experimentation.

## Normal science?

Schairer and Schöniger's work on tobacco and lung cancer is of interest, among other things, for what it tells us about the fate of science in a totalitarian dictatorship. For one thing, it shows that certain kinds of science can actually flourish, if they are not seen as contrary to the ideological goals of such a state. Had Germany won the war, one can imagine that Astel's institute would have continued producing sophisticated science; as it was the institute was formally dissolved in November 1945, when Russian military authorities confiscated the funds of Jena's Thüringische Staatsbank.

However, there is another interesting element to this story, which is that the paper translated here was by and large ignored by post-war scientists. The *Science Citation Index* reveals that the paper was cited three or four times in the 1960s, only once in the 1970s, and then not again until 1988, when Ernst Wynder cited it in an article in *Public Health Reports*. The paper was unknown even in Germany, where one might have expected more sympathetic treatment. A 1953 German-language bibliography devoted exclusively to the topic of 'Tobacco and Cancer' does not include Schairer and Schöniger's article.<sup>11</sup> Even today, Germans tend to present the history of tobacco/cancer research as if it were entirely an Anglo-American affair, ignoring local contributions. The fear may be that by acknowledging such a work, one might somehow give credence to Nazis ideals or policy. The conventional view seems to be that Nazism gave birth only to monsters, and that anything with roots in this era must be tainted.

There are other areas of biomedical science where similar views held sway. James Watson in his book, *The Double Helix*, tells the story of how Gerhard Schramm's subtle studies on viral biochemistry were ignored or dismissed by post-war scientists, thinking that good work simply could not have been done by Nazi scientists<sup>12</sup> (Schramm was a member of the SS and a key figure in Adolf Butenandt's Kaiser Wilhelm Institute for Biochemistry). Similar prejudices may have been at play with regard to German tobacco work—though language barriers may also have played a role. Many wartime-era German journals were never shipped abroad, a casualty of the disintegration of international co-operation, but also a result of subscription cut-backs, communications breakdowns, and the boycott of German journals by several professional groups in Allied nations.

Tobacco epidemiology was also not the kind of thing Allied military authorities were interested in, when they began to comb through German science and engineering in search of exploitable findings. No effort was made to exploit Germany's pioneering tobacco work, e.g. in the *FIAT* reviews of German science, a veritable *Encyclopedia Naziana* published shortly after the war by US and British military authorities. The focus was rather on sciences that might prove of 'strategic' interest—defined in military terms. There is an interesting irony here, insofar as rocket bombs and aerotechnical engineering skills were exploited—often to the point of kidnapping and transferring the scientists themselves abroad—when sciences that could have clearly helped save lives were ignored. US priorities in this area became clear when an effort was launched to resupply Germany with tobacco. In 1948 and 1949, the US shipped 93 000 tons of blond Virginia-blend tobacco free of charge to the defeated nation as part of the Marshall Plan.<sup>13</sup>

Perhaps I may end with a speculation, that the net effect of the Nazi war on tobacco—and I am talking only about Germany here—was actually to forestall the development of effective anti-tobacco measures by several decades. Nazi ideals seem to have helped foster some world-class tobacco science (think also of Franz Müller's paper, which actually came to stronger conclusions than Schairer and Schöniger's),<sup>14</sup> but they ultimately dragged it down, both by destroying the German economy and by tainting Nazi-era research with some of history's most inhumane policies. In the post-war era, memories of Nazi-endorsed asceticism were not exactly pleasant ones. Nor did tobacco control fit very well with the consumerist urges of the 1950s or the more carefree bacchanalian ethics of the late 1960s and 1970s. Germany today has one of Europe's worst records in the area of tobacco control, despite being home to some of the world's first tobacco epidemiology. European and American tobacco companies have both tried to play the Nazi card, associating smoking restrictions with Nazi-like policings.<sup>15</sup>

One of the jobs of the science historian, however, is to explore how strange and unexpected historical forces can influence the flourishing (or stifling) of science. The resurrection of this pioneering paper will hopefully throw new light on a largely forgotten chapter of tobacco science, and the curious political circumstances in which it arose.

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# Commentary: Pioneering research into smoking and health in Nazi Germany—The ‘Wissenschaftliches Institut zur Erforschung der Tabakgefahren’ in Jena

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The Scientific Institute for the Research into the Hazards of Tobacco (Führer in health Wissenschaftliches Institut zur Erforschung der Tabakgefahren) was founded on 5 April 1941 at the Friedrich-Schiller University in Jena in the presence of political dignitaries such as the Reichsgesundheitsführer (regional party leader), Leonardo Conti, and the Regional Minister and Gauleiter of Thuringia, Fritz Sauckel.<sup>1–5</sup> The Institute was the first of its kind worldwide. The inaugural ceremony was a festive occasion held in the main lecture theatre to the accompaniment of an orchestra playing Mozart. The President of the Reichsgesundheitsamt (Office of Public Health) of the Third Reich, Professor Hans Reiter gave the keynote address.<sup>6</sup> He thanked Gauleiter Sauckel for his valuable personal efforts in setting up the Institute. The racial hygienist and Professor of Medicine, Karl Astel who was the Dean of the University of Jena and headed both the Office for Racial Affairs and the Office for Public Health and Social Affairs of the State of Thuringia, however, was the driving force and chairman of the Institute. Astel had earlier described abstinence from smoking as a ‘national-socialist duty’ and was himself a militant non-smoker. Addressing ‘His Magnificence Prof. Dr Astel’, Reiter said that ‘by carrying out your plan, you have cleared a way through the undergrowth of objections put forward by selfish people which will become broader and broader in the future’. Please nurture this project which may save the German Volk hundreds of thousands of valuable workers.<sup>6</sup>

The ceremony of the foundation of the Institute was part of a conference on the ‘Tabakgefahr’ (the hazard of tobacco) which took place under the auspices of Reichsgesundheitsführer Conti in Weimar. On the occasion of this conference and the foundation of the Institute, Fritz Sauckel and Leonardo Conti telegraphed greetings to the Führer in Berlin. Adolf Hitler replied: ‘I am very grateful for the telegram received from the First Scientific Conference for Research into the Dangers of Tobacco and the official opening of the Scientific Institute which will serve these purposes in Jena. In reply to your greetings, I

send my best wishes for your work which will liberate mankind from one of its most dangerous poison’.<sup>6–7</sup>

Best wishes were not the only support provided by Hitler. He made a donation of over 100 000 RM out of his personal resources to fund the establishment of the Jena Institute.<sup>6,8</sup>

## The anti-smoking campaign in Thuringia

The developments at the university were accompanied by a massive campaign against smoking in Thuringia, which was under the auspices of Gauleiter Sauckel. For example, smoking in public by women under 25 years of age was prohibited.<sup>9</sup> Within the framework of this campaign Astel banned smoking at the University of Jena on 1 May 1941. As Head of the Department of Public Health of the State of Thuringia, he subsequently also prohibited smoking in all hospitals, polyclinics and other health institutions. However, this campaign was not undisputed. Goebbels’ Ministry of Propaganda agreed in principle, but considered that a nationwide campaign in the mass media would not be feasible because authorities such as teachers and doctors were setting a bad example by smoking themselves. Furthermore, leading figures in party and state, including Reichsmarschall Göring, indulged in tobacco in public.<sup>9</sup> The Ministry argued that if the campaign was unsuccessful and had to be abandoned, the enforcing authorities would make fools of themselves. In general a campaign against smoking was not considered to be sensible in wartime.<sup>9</sup> It is unclear to what extent the efforts in Thuringia, which had been conducted with the special agreement of Hitler, had been successful, but the campaign’s success was probably modest at best.<sup>3,4</sup>

## The research at the Institute

The work at the Institute was hampered by a lack of resources: the Institute never had its own premises and laboratories or staff, but was entirely dependent on the contributions made by other researchers at University of Jena, for example the Chair of Physiology, Professor Emil von Skramlik. In 1942, in a letter addressed to the racial hygienist, Professor Günther Just, Skramlik wrote: ‘As you know a Scientific Tobacco Institute has been set up in Jena in 1941 under the leadership of Councillor of State Professor Karl Astel, Dean of the Friedrich-Schiller University. I am heading the Department of Physiology at this Institute’.<sup>10</sup>

Just immediately became involved in the research activities of the Institute and in 1943 received a total of 3000 RM from

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the Institute's resources for experimental work.<sup>11</sup> It is uncertain what research Emil von Skramlik performed in the Institute's Department of Physiology. It is clear from administrative records, however, that the Institute performed smoking trials in volunteers: on 20 October 1941, a 'Mr L' from Jena wrote an invoice for 12 RM for 'smoking trials performed in June 1941'.<sup>12</sup> Little is known about these trials which continued to be part of the research programme of the Institute at least until summer 1942. It was Astel's wish that the findings from the research should be disseminated in collaboration with Emil von Skramlik in a 'Kulturfilm' (documentary to be shown in cinemas). Von Skramlik built on documentaries of the poisonous effects of nicotine on marine animals he had shot previously.<sup>2</sup> Unfortunately the material could not be traced after the war.

In addition to the physiologist von Skramlik, other physicians from Jena examined the effects of nicotine on the organism. Dietrich von Keiser from the Department of Surgery examined the effects of nicotine on stomach action. In 1943 these studies were accepted as von Keiser's 'habilitation' at the University, a qualification which authorised him to teach at the University.<sup>13</sup> Unfortunately the relevant documents can no longer be located, but we do know that von Keiser intended to examine 400 volunteers, mainly SA men.<sup>14</sup> The report of the referee state that von Keiser X-rayed 300 people and found differences in the secretion of stomach juices and stomach peristalsis between smokers and non-smokers.<sup>15</sup> The pathologist Professor Eberhard Schairer<sup>16</sup> performed animal experiments with the support of the Tobacco Institute and, together with his doctoral student Erich Schöniger, mounted an epidemiological investigation into the connection between smoking and lung cancer.<sup>17,18</sup>

## Doctoral theses

Schöniger was not the only doctoral student working on tobacco-related issues. Between 1942 and 1945, seven doctoral theses dealing with the effects of tobacco and nicotine were completed at the Medical Faculty (Table 1). However, only three of these can unequivocally be attributed to the Tobacco Institute. It is unclear how many other students worked on tobacco-related theses but never submitted their work.

The first of the series of seven theses was entitled 'The woman smoker' and was submitted in 1942 by Gabriele Schulz and Käte Dischner. In addition to Astel, the Chair of Psychiatry, Professor Berthold Kihn co-supervised the dissertation which, with 127 pages, was rather more substantial than usual. The two students formulated the rationale for their study as follows:

'In relation to the guidance of our people in health matters, which is of particular importance now that we are at war, the issue of smoking is clearly an important issue for discussion ... The findings from scientific research have documented the harmful effects of tobacco on the nation, however a large proportion of the German people has not yet been able to give up smoking'. The thesis should support women, 'who as the carriers of life should be at the forefront of promoting health', in their decision to quit smoking. The two students interviewed a total of 175 female smokers in order to document the negative consequences of smoking. Their sample included 75 women prisoners, some of them political prisoners, in three penal institutions in central Germany. Access to these women was 'kindly facilitated' by Astel.

Werner Feuerstein, a soldier who had been ordered to study medicine and who was a member of a student battalion in Jena, completed a thesis on 'Nicotine deaths over the past 100 years' in 1943. He examined 56 recorded deaths due to nicotine poisoning, including accidental deaths after ingestion of pesticides, murders and suicides related to nicotine ingestion. Heinz Held, on the other hand, investigated 'the effects of nicotine on the ion ratio of potassium and calcium in the human body' in a dissertation completed in 1944. In his introduction he wrote 'with the firm commitment of the leaders of our state to form healthy and strong future generations who can take on the great tasks of the future, the issue of nicotine has become the focus of attention'. Rolf Schroder's thesis from 1944 on 'The neurological damage inflicted by tobacco. Compilation of known cases' documents that neurologists and psychiatrists had developed an interest in the 'Tabakgefahr'.

In 1944 the first thesis to be performed under the direct responsibility of the Tobacco Institute was completed. It was an experimental piece of work which dealt with 'the effect of nicotine on worms'. The experiments were performed by the student Lore Wenzel under the supervision of Emil von Skramlik. In a further dissertation which was submitted in 1944 by Maria Schumann, the poisonous effects of nicotine in white mice, guinea pigs, rabbits and frogs which had been kept in a smoke-filled room for extended periods of time were described. Emil von Skramlik again supervised this work. The scientifically most important thesis is of course the study by Erich Schöniger. Schöniger worked under the supervision of the pathologist, Eberhard Schairer<sup>16</sup> on 'Lung cancer and tobacco consumption'. Their results were published in 'Zeitschrift für Krebsforschung' in 1943<sup>17</sup> before the thesis was submitted in 1944. This landmark study is published for the first time in English in this issue of the journal.<sup>19</sup>

**Table 1** Tobacco-related doctoral theses submitted to the medical faculty of University of Jena in the 1940s

Year	Title of thesis	Student(s)
1942	Die Zigarettenraucherin ( <i>The women smoker</i> )	Gabriele Schulz, Käte Dischner
1943	Nikotin-Todesfälle der letzten hundert Jahre ( <i>Nicotine deaths over the past 100 years</i> )	Werner Feuerstein
1944	Die Einwirkung des Nikotins auf das Ionenverhältnis von K:Ca im menschlichen Körper ( <i>The effects of nicotine on the ratio of potassium to calcium in the human body</i> )	Heinz Held
1944	Die neurologischen Schäden durch den Tabak. Zusammenstellung der Fälle, die darüber bekannt geworden sind ( <i>The neurological damage inflicted by tobacco. Compilation of known cases</i> )	Rolf Schroder
1944	Ueber den Einfluss des Nikotins auf Würmer ( <i>The effect of nicotine on worms</i> )	Lore Wenzel
1944	Ueber den Einfluss des Tabakrauches auf Tiere ( <i>On the effect of tobacco smoke on animals</i> )	Maria Schumann
1944	Lungenkrebs und Tabakverbrauch ( <i>Lung cancer and tobacco consumption</i> )	Erich Schöniger

A number of scientists from outside the University of Jena contributed to research at the Institute. In addition to Günther Just, other scientists such as the Director of the Institute for Racial Hygiene at the German University in Prague, Professor Karl Thurns and the pharmacologist, Professor Gustav Kuschinsky, also from Prague, conducted research in collaboration with the Institute and received financial support from the Institute. Karl Astel also invited one of the best known tobacco researchers of the time, Fritz Lickint, to collaborate with the Institute.<sup>20</sup> The gynaecologist, Paul Bernhard from Duisburg, made use of the focus on tobacco at the University of Jena and submitted his habilitation on 'The effects of tobacco poisons on the health and fertility of the woman' in January 1942. The process was successfully concluded in March 1942 and the revised version of Bernhard's text was published less than a year later.<sup>21</sup>

Despite all the activities of Karl Astel, the Scientific Institute for Research into the Dangers of Tobacco achieved only marginal scientific significance and reputation. Astel committed suicide ten days before the end of the war, presumably to avoid facing the consequences of his activities as a leading racial hygienist in the Third Reich and the Institute was disbanded and remained forgotten for half a century.<sup>2,3,5</sup>

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# Commentary: The Third Reich—German physicians between resistance and participation

E Ernst

To evaluate the role of the medical profession in the Third Reich is a delicate and difficult task. Its participation in major atrocities was, to a large extent, hushed up and recent reports of medical opposition may, in many cases, be exaggerated. Much of the evidence has been destroyed or is not easily accessible. Furthermore, an objective view is potentially clouded by a number of issues related to the past or outlook of the evaluator. Finally, when looking at history with hindsight, there is the danger of arrogance in those who have not actually lived through it.

The following account therefore makes no claim to be either objective or complete. It is a personal analysis of a (non-Jewish) German physician who was born after the war and struggles to understand what happened.

## Active participation

### History of 'race hygiene'

In the second half of the 19th century, 'Social Darwinism' had spread throughout Europe. This theory assumed that nations, like animal species, fight for the survival of the fittest. The fittest nation would be the one that is genetically the 'purest'. German

proponents of Social Darwinism were to expand the theory significantly: Alfred Ploetz coined the term 'race hygiene' (Rassenhygiene), Ernst Haeckel was the first to consider the killing of 'weaklings',<sup>1</sup> and the physician Fritz Lenz formulated his concept of racial inequality which directly influenced Hitler.<sup>2</sup> Binding and Hoche finally lobbied for the extinction of 'life unworthy of living'<sup>3</sup> suggesting that this could be a curative measure (Heilbehandlung) not necessarily requiring consent from its victims. Growing anti-Semitism and 'Social Darwinism' added together resulted in 'race hygiene'. As the word implies, 'race hygiene' was essentially a medical issue.

### Medicalization of racism

Hitler frequently referred to the Jewish race in medical terms, as a 'bacillus', 'parasite' or 'disease'. His followers adopted these medical analogies. In their minds, the 'biological body of the German people' (Volkkörper) was threatened by the Jews. Actions against Jews were promoted as acts of defence (Notwehr-Antisemitismus) in the all-deciding struggle for survival. On 15 September 1935, a law was passed that made marriages and extra-marital intercourse between Aryans and Jews illegal. It was termed 'Law for the Protection of German Blood and Marriages'.<sup>4</sup>

The German medical profession bore and promoted the belief that curing patients was one thing but to heal the nation was incomparably more important: 'The maintenance of a genetically homogeneous and healthy stock of the German people is the main duty of the German physician'.<sup>5</sup> The vast majority of the German medical profession were willing to adopt the ideas of race hygiene; many even went further and perverted them into applied racism. Race hygiene had been initially developed by and was later entrusted to the German medical profession. To a large degree, the medical profession was not politicized but politics were medicalized.

### Involuntary sterilization

To stop the 'contamination' of the German people by 'inferior' blood, forced sterilization was legalized on 14 July 1933, soon after Hitler took power in January 1933, through the 'Law for the Prevention of Genetically Diseased Offspring' (Gesetz zur Verhütung erbkranken Nachwuchs). The quick move had been possible because of much preparatory work during the Weimar Republic, initiated not least by the medical profession.<sup>6</sup> The law provided that (allegedly) handicapped individuals were to be identified, examined by a jury of 'experts' and subsequently sterilized. Some 200 'Genetic Health Courts' were instituted. They ordered the involuntary sterilization of approximately 400 000 individuals. In 1934 alone, 28 286 men and 27 958 women thus became the victims of involuntary sterilization.<sup>7</sup> The overwhelming majority of the medical experts' reports were later found to be of unacceptable scientific quality; almost all had recommended sterilization.<sup>6</sup> It is estimated that 50 000 women were forced into eugenically directed abortion performed by German gynaecologists<sup>8</sup> while, at the same time, the laws against voluntary abortions were tightened and the total number of abortions therefore declined.

Through accepting the role of experts in these juries, physicians had assumed an executive position within the National Socialist (NS) state.<sup>9</sup> Leading proponents of race hygiene, however, believed that involuntary sterilization did not go far enough. In

their view it generated human 'ballast' and an economic burden which had to be eliminated by other means. Thus, the concept of involuntary medicalized killing, wrongly termed 'euthanasia', was developed.

### Involuntary euthanasia

The NS euthanasia programme secretly started in specialized medical departments in 1939. In theory, the programme was aimed at disposing of children suffering from idiocy, Down's syndrome, hydrocephalus and other abnormalities.<sup>10</sup> Even though this programme was not specifically directed against Jews, it was sufficient for physicians to fill in the diagnosis 'Jew' to issue what in essence was a death sentence.<sup>11</sup> At the end of 1939, the euthanasia programme went into its second stage by being extended to adults 'unworthy of living'. Almost 100 000 (predominantly psychiatric) patients became its victims.<sup>12</sup> The programme disposed of an estimated four-fifths of all psychiatric patients, and psychiatrists started wondering whether there would be enough patients left to keep their speciality alive.<sup>13</sup>

'Action T4' (named after the address of its Berlin headquarters in Tiergartenstrasse 4) was the organizational centre of the programme which was run by some 50 physicians. They sent out questionnaires to psychiatric and other hospitals urging doctors to name candidates for euthanasia. These patients were then transported to specialized centres where they were gassed or poisoned and subsequently cremated.<sup>14</sup> Others were executed through lethal injections or starvation in psychiatric hospitals. Hitler himself discontinued the programme on 24 August 1941, following increasing opposition from both the general population and the clergy.<sup>11</sup> The medical profession's protest to these activities (see below) was minimal and ineffective. Despite Hitler's official decree, the programme continued as 'wild euthanasia' without official authorization. Even in 1944 (i.e. shortly before the collapse of the NS state), the directors of psychiatric institutions received an appeal to relieve the pressure on beds by disposing of (Beseitigung) their patients.<sup>15</sup> 'Action T4' amounted to medically supervised murder. Its true significance, however, lies in the fact that it was a pilot project for the 'Final Solution'.<sup>13,14</sup>

### The Final Solution

'Without psychiatry, the holocaust would probably not have taken place'.<sup>16</sup> The technical know-how of 'action T4' provided the basis for the anticipated total extinction of all Jews within the (then) expanding Reich. The link between 'T4' and the Final Solution was 'Action 14f13' termed after the file-number it obtained in the official files. 'Action 14f13' was initially designed to kill all handicapped and insane prisoners in the concentration camps.<sup>17</sup> It grew into an elaborate programme of killing all individuals of Jewish or other non-Aryan blood. The diagnosticians who decided over life and death within this monstrous project were, according to Himmler's wish, experienced psychiatrists.

Almost without exception, those physicians who had gained experience in 'action T4' took charge of the Final Solution.<sup>11</sup> The strategy for the anticipated extinction of the Jewish race was decided on 20 January 1942 at the Wannsee-Conference:... 'in the course of the Final Solution, Jews should be brought... to work in the East... a majority will doubtlessly drop out through natural decimation... The eventual rest... will have to be treated accordingly...'.<sup>18</sup> To be 'treated accordingly' meant to be killed.

Jews from all parts of the Reich were transported to one of numerous concentration camps. Those who had survived the transports were 'selected'. The choice was either to go to the gas chambers immediately or to be exploited as labourers until too weak to carry on. This, in turn, also meant death through gassing.

The 'selection' was strictly a medical task, performed by teams of SS-doctors who formed an essential part of each camp. One of the camp doctors later stated: 'There were the various officers, the doctor in charge and the unit commander. He had the task of making sure that everything remained orderly. I only saw it twice myself. The Kapos (camp inmates—criminals, political prisoners, and later, Jews—used by the Nazis to head the labour squads) would carry out a large pre-selection of children, very old women, and old men. There were additional selections carried out by certain personnel, after which the doctor had to decide. Now a lot depended on the size of the transport. If it was very large, the selection process was very superficial. If it was a normal-size transport, then things were done more thoroughly. The transports came at night, and if you had your normal duties during the day and then had to work extra at night, well...'<sup>19</sup> While the pilot project (action T4) had killed thousands, the Final Solution eliminated millions under the trained guidance and supervision of physicians.

### NS 'research'

Many camps also engaged in medical research. At this stage *misguided science* (Social Darwinism) had been perverted into *pseudo-science* (race hygiene) which, in these research centres, was further degraded into *criminal science*. Typically the projects were run by SS-doctors with some affiliation to German medical schools. Often the research questions were determined through the 'necessities of war': What is the best way to survive in cold water? How can one survive on drinking seawater? How can one stop bleeding after injury? How can certain dangerous infectious diseases be prevented? Other research focused on the 'purification' of the German race. This included practical methods of sterilization and mass killing.<sup>20-22</sup> Altogether there were over 60 different research projects carried out in the camps.<sup>23</sup> The hallmark of all of the experiments was their unspeakable cruelty, unprecedented in the history of medicine.

The heads of research were often apparently normal SS-doctors with few signs of overt psychological pathology.<sup>24</sup> The motivation of working for a 'higher aim' (e.g. for the best interest of the German nation) was a central theme which, in their minds, freed them from ethical obligations and humanitarian medical traditions. Many of the experiments were designed such that the 'object' would die at its conclusion—if only so that (s)he could be further investigated by the pathologist.

### Resistance

'It is also a sign of cowardice, of lack of moral courage when Aryan German doctors ignore this prosecution of Jewish doctors'.<sup>25</sup> Indisputably, there has been relatively little effective German opposition against the horrors of the Third Reich. It has been estimated that, between 1933 and 1945, some 800 000 individuals (15%–20% women) were imprisoned for resistance to the regime.<sup>26</sup> The succession of evil, as outlined above, remained largely unaffected by this opposition. Amongst the resistance that

did emerge, only a small part was driven by the medical profession. Why? Should doctors, through their Hippocratic oath, not have been the ideal and natural profession to oppose? And should they not have been aware of what was going on? Several reasons are usually offered to explain this apparent contradiction.

Lack of courage, as quoted above, may be a contributing element but is unlikely to be a major factor. Doctors joined the NS party in higher percentages than any other profession. About 45% of doctors were party members (among teachers about 20% were members), 26% were SA members (about 11% teachers) and 7.3% were SS members (0.4% teachers).<sup>26</sup>

Germans have often been characterized through their sense of duty, their patriotism (before 1945), their need for law and order and their high level of obedience. These qualities do not readily lend themselves to resistance against a dictatorship. Yet such arguments do not explain why German doctors offered less resistance than other professions (see below).

Doctors might simply not have been aware of what was going on. Clearly not everyone knew everything and some may indeed have known very little. But generally speaking, the profession as such was in an excellent position to realize at least some crucial facts, particularly as not a small proportion was being published in official German medical journals. If doctors did not know, it must have been because they did not want to know.

With hindsight, the most plausible reason for the scarcity of medical opposition is the fact that any emerging resistance was radically crushed in its earliest stages. Within weeks after Hitler came to power in 1933 the German medical system was hierarchically structured with high rank positions being occupied by 'trustworthy' SS men.<sup>27</sup> Most professional bodies, particularly those in natural opposition to fascism like the 'Verein Sozialistischer Ärzte', were dissolved. All doctors in key positions had to go through a special training programme at the 'School of Leaders of the German Medical Profession' in Alt-Rhese.<sup>28</sup> Potential opponents were dismissed, forced into immigration or sent to the concentration camps.

At the Medical School of Vienna, for instance, some 80% of all medical staff were fired instantly after the NS take-over of Austria in 1938.<sup>29</sup> During the first year of the Third Reich, no less than 116 professors and medical researchers were dismissed from German Medical Schools.<sup>30</sup> Between 1933 and 1939, some 8000 academics from Germany and Austria emigrated to the US. Those who remained in office were so highly selected and conformist that 'Gauleiter' Streicher could, in a speech at the University of Berlin, ask: 'If one were to assemble all the brains of University professors and put them on one side of a scale and place the Führer's brain on the other, which side do you think would outweigh the other?'<sup>31</sup> Given this most effective prevention of resistance, it may even surprise that any opposition evolved at all.

Various forms of opposition or resistance may be differentiated and require to be judged separately: protest (oral or through publications), passive resistance, emigration (see above), resignation from office, industrial action, material support to organized groups, desertion from military service, refusal to follow orders, sabotage and assassinations. Only a few of these options were chosen by doctors.<sup>32</sup>

The subject of resistance against the Third Reich can be viewed as imbedded into a multi-dimensional framework. One dimension is time. Resistance before 1933 has a different meaning

and importance than resistance at a time when the collapse of the Third Reich was imminent. Another dimension is personal motivation. Resistance for humanistic reasons must be seen differently from one driven by political motives (e.g. being a communist or socialist) which is different again from resistance on patriotic grounds (e.g. realizing that the war was driving Germany into foreseeable disaster).

The target of the resistance also deserves consideration. Clearly resistance against the dismissal of a Jewish colleague is a different matter from opposition against sterilization or euthanasia of (mostly Aryan) psychiatric patients or resistance against (Jewish) genocide. A further dimension is provided by the fact that different individual backgrounds lend themselves to different forms of and motivations for resistance. From these theoretical considerations it is clear that a given individual may have opposed one activity and participated in another (see below).

Because of the combination of scarcity of resistance, on the one hand, and complexity of inter-linked covariables, on the other hand, the following discussion will merely focus on an *arbitrary* selection of 'case studies' describing both individual and organized resistance in some of its guises.

### The International Medical Bulletin (IMB)

At various stages of the Third Reich, several publications existed that more or less overtly criticized the NS regime and its actions: Neu Beginnen, Sozialistische Aktion Grenzecho, Der Deutsche Weg, Deutsche Briefe, Blick in die Zeit, Rhein Mainische Volkszeitung, Hochland and Stimmen der Zeit.

To the best of my knowledge, the only medical publication to stimulate opposition was the IMB. The Prague-based journal was re-named in 1934 and published until 1939. It was the official organ of the International Medical Union, an outgrowth of the earlier Socialist Medical Association. Its editors believed that 'fascism is the end of European culture'. Driven by socialist/communist convictions they regularly published critical reports on Hitler's politics. It is unknown how many German doctors read the IMB or what its true impact was. Today the IMB's republication<sup>33</sup> provides a rich and intriguing source of information.

### Doctor John Karl Friedrich Rittmeister

In 1941 Dr. Rittmeister (born 1898) was appointed director of the Psychotherapeutic Policlinic at the Berlin Institute of Psychotherapeutic Research and Psychotherapy. In this position, he helped many who were pursued by the NS regime for political or racial reasons. In 1941 he came into contact with the 'Rote Kapelle' (Red Chapel, a name coined by the NS regime to describe the communist leadership of this group). This organization was a heterogeneous gathering of individuals with different aims and backgrounds. Four of its members were doctors. Their activities range from the distribution of information to sabotage and intelligence work. Rittmeister became the co-author of 'AEGIS', the group's leaflets describing 'the horrible tortures and atrocities' of the Third Reich. He was caught in 1942, interrogated and tortured for 9 months and executed in Berlin-Plötzensee on 13 May 1943.<sup>34</sup>

### Other German psychiatrists

Several other German psychiatrists were opposed to the misuse of psychiatry as a murder weapon within the euthanasia programme. Leading figures were Karl Bonhoeffer and Karsten

Japerson. Japerson was head of the Department of Psychiatry at Bethel, an institution that was sponsored by the Church. He relentlessly rallied against involuntary euthanasia and refused to co-operate in it. In 1940 he even filed a lawsuit for murder against the programme.<sup>35</sup> Dr Japerson was instrumental in stimulating the Church's protest against euthanasia that eventually helped to stop its official part (see above). He repeatedly tried to organize the protest of the profession but in this he sadly failed. Other opposing psychiatrists mentioned by an eyewitness were: Ewald, Kuha, Creutz, Boestrom, Behringer, Braun, Kleist, Meyer, Willige, Creuzfeld.<sup>35</sup>

### Die Weiße Rose

Several organized resistance groups existed during the Third Reich: Reichsbanner, Rote Frontkämpfer, Eiserne Front, Neu Beginnen, Rote Kapelle (see above) and the Europäische Union. These may have had some medical input but 'Die Weiße Rose' was the only one predominantly related to medicine; it was an initiative of medical students. Its founder, Hans Scholl, came from a liberal family background yet was educated in the NS way. He had gone through a period of enthusiastic agreement with this regime, but soon became disillusioned with it. In discussions with other students, he and his sister Sophie began to formulate criticism which was motivated predominantly on moral and ethical grounds. The group was joined by Alexander Schmorell, Christoph Probst, Traute Lafrenz and Willi Graf who were all medical students. Later they also admitted others unrelated to medicine.

In 1942 the group began to anonymously mail critical texts to selected groups of key personalities in and around Munich: 'Each word that comes from Hitler's mouth is a lie...'. The leaflets also spoke of the Germans' guilt through the Jewish genocide and asked why an entire people could watch apathetically while all this was happening. The group distributed a series of well-written, thoughtful pamphlets, but eventually they grew careless. On 18 February 1943 Hans and Sophie Scholl were caught distributing several hundred leaflets in the university. The intensity of the ensuing rage is evidenced by the fact that, by 22 February 1943, Hans and Sophie Scholl, and Christoph Probst were sentenced to death and executed the same day. Three more death sentences followed after a second trial several days later.<sup>34</sup>

The group had established contacts with similar-minded students in Hamburg. The 'Weiße Rose Hamburg' was founded in 1942. About 30 of its members were arrested in 1944 and 8 were executed.<sup>34</sup> Other centres had been planned in Sauerbrücken, Berlin and Köln.<sup>36</sup>

### Professor Sauerbruch

This internationally acclaimed surgeon is seen by some historians as one of the worst NS doctors, while others acknowledge that he opposed certain issues of the regime.<sup>34</sup> In several ways his attitude and behaviour can be seen as characteristic of large sections of the German medical profession.

Like many doctors of that time, he was a patriotic nationalist and a monarchist at heart. Thus he was supportive of what he perceived as the NS regime's ambitions to restore Germany's honour, integrity and international standing. At the same time he was opposed to certain aspects of National Socialism. His national and international reputation provided him with unusual

privileges and direct personal contact with men in the highest ranks of power, including Hitler himself.

Sauerbruch occasionally showed courage in directly opposing the NS regime. For instance, he personally prevented SA troops from putting the Swastika flag on the roof of his department.<sup>37</sup> He protected or offered to protect Jewish doctors like R Niessen. Sauerbruch called Niessen, who had been his second man in the department, 'bloody headed' when he told him about his decision and motivation to emigrate.<sup>37</sup> It was at Sauerbruch's house that liberally minded people could make contact.<sup>36</sup> He also spoke his mind, for instance, about Hitler whom, during the final years of the Third Reich, he thought mad, or about the ill-effects of NS politics on medical educational issues. Sauerbruch protested against euthanasia in 1940<sup>34</sup> and he was a member of the 'Mittwoch Gesellschaft', an association of liberal intellectuals that was later declared illegal.

On the other hand, Sauerbruch became a willing instrument of the NS regime in many ways. His open and widely publicized letter 'to the doctors of the world' was an attempt to reassure the international community that 'the national German government believes in peace and sees its highest task in safeguarding it'.<sup>38</sup> He also accepted several NS honours like the title of 'Senatsrat', the 'Nationalpreis' (NS substitute for the Nobel Prize) and the post of Surgeon General of the German Army. The NS officials used his reputation to gain prestige and support for their own aims. There is little doubt that Sauerbruch was aware of this fact and knowingly let it happen or even profited from it.<sup>37</sup>

In retrospect it is easy (yet true) to say that Sauerbruch's attitude was based on a profound misjudgement of the NS State. He tried to oppose certain issues, yet at the same time he allowed himself to be used in many ways. Perhaps most importantly, he failed to do more to prevent the worst.<sup>39</sup> Thus Sauerbruch 'may aptly serve as a symbol for the ultimate dilemma of German medical scholars under Hitler, in the best and worse times'.<sup>2</sup>

## The Fourth Reich

On 20 August 1947 the US military court pronounced the sentences against the defendants accused of crimes against humanity in the 'doctors' trial'. Such action has no precedent in medical history. Death sentences were given to: Viktor Brack, Prof. Karl Brandt, Dr Rudolf Brandt, Prof. Karl Gebhardt, Dr Waldemar Hoven, Prof. Joachim Mrugowsky and Wolfram Sievers. Imprisonment for life sentences were received by: Dr Fritz Fischer, Dr Karl Genzken, Prof. Siegfried Handloser, Prof. Gerhard Rose, Prof. Oskar Schröder, Dr Hermann Becker-Freyseng and Dr Hertha Oberheuser. Two further doctors were given prolonged sentences of imprisonment and seven were declared not guilty.

The defendants found guilty at this tribunal were the ones known and apprehended at the time. After the tribunal, Mitscherlich and Mielke estimated that a total of 350 doctors had behaved criminally.<sup>22</sup> In the light of data collected since this probably represents a gross underestimation. The more important point is that the German medical profession as a whole made these crimes possible. To put it in the words of Willi Graf, member of the Weiße Rose (see above): every single individual carries the entire responsibility.<sup>40</sup>

The medical profession's ensuing process of coming to terms with the participation in the worst medical violations of humanity in the history of mankind is neither honourable

nor complete. Mitscherlich and Mielke's account of the 'doctors' tribunal'<sup>22</sup> was printed to be distributed at the Annual Assembly of German Doctors in 1948. Almost the entire circulation of 10 000 issues mysteriously disappeared before distribution took place. H-D Söling called the era following 1945 the 'Fourth Reich' indicating that within German medicine (too) much had stayed the same.<sup>41</sup>

Many of the above-mentioned prison sentences were served only partly. Many doctors with a history of active anti-Semitism, several with a clear criminal record, were allowed to carry on working in their profession, some in high official positions.<sup>41,42</sup> In Vienna almost all the perpetrators remained in or regained their positions.<sup>29</sup> The Jewish colleagues who were forced to leave their country were rarely welcomed back. For many years, the subject of NS medicine was an absolute taboo (in Austria it remained so until the 1990s.<sup>29</sup> A recent survey of German gynaecologists<sup>43</sup> showed that 86% believed that the process of discussing the past had not even started.

When, in the 1970s, the first German physicians of the new generation started researching the subject of NS medicine, they were viewed as 'soiling their own nest'. Very few of their colleagues had (or indeed have) the insight to understand that such an activity is essential for 'cleaning their own nest'. In the late 1980s, the German Medical Journal (Deutsches Ärzteblatt) finally published a series of articles on 'Medicine in the Third Reich'. Its response in the letters section of the journal had a flavour of racism 'that had reached the limit of being bearable'.<sup>42</sup> The German professional body of gynaecologists took until 1994 to issue an official apology to the victims of NS gynaecology.<sup>8</sup> Psychiatric patients who were sterilized during the Third Reich have never been officially acknowledged as victims. No compensation was paid on the grounds that, at the time, forced sterilization was legal.<sup>12</sup> Some leading German psychiatrists even defended sterilization after the war.<sup>44</sup>

In 1987 a medical student wrote to Karsten Villmar, president of the German Medical Association asking how the profession could deem itself free of guilt while it still employed doctors who, many thousand times, had violated a basic axiom of physicianship. Villmar responded with the advice to 'urgently fill the gaps in her knowledge regarding the function of a democratic liberal state'.<sup>41</sup> The same Dr Villmar, who became the highest ranking German medical official in 1978, publicly announced that 'only a minority of German doctors ... had spoil the reputation of our profession'.<sup>2</sup>

Instead of trying to understand what had happened and how it was allowed to happen, the German medical profession turned the subject of NS-medicine into a taboo. This pathophysiology of silence climaxed in the destruction of documents. Even years after the Third Reich, investigators are confronted with a 'wall of silence' when attempting to research the subject.<sup>45</sup>

When avoiding the topic was no longer possible, the German medical profession blamed everything on a few diabolically mad exceptions within their ranks. Self-criticism on a broad basis has so far not taken place. Only very few ask the question how the events between 1933 and 1945 have influenced present medical thinking in Germany and elsewhere. Today even reflective German medical opinion leaders take the view that 'we cannot constantly go on feeling ashamed for others'. The 'others' have mostly perished now, and the German medical profession, by and large, has successfully avoided learning an important lesson from its own history.

## Conclusions

The participation in the 'betrayal of Hippocrates' had a broad basis within the German medical profession. Without the doctors' active help, the Holocaust could not have happened.<sup>16,22,46</sup> Resistance even against the most outrageous crimes was minimal and was certainly not led by physicians. After the Third Reich, the profession turned the subject of NS medicine into a taboo. When this was no longer successful, it promoted the myth that the atrocities were performed by a tiny minority of deranged outsiders. To the present day, the German medical profession has evaded meaningful introspection or self-criticism. Some of the questions that could have been addressed in this context are: What are the necessary preconditions for such atrocities to happen? How can they be prevented in future? Are there any early warning signals? In what way was the Germany of 1933 unique? Did (do) similar violations of medical ethics happen elsewhere? Where is the line between a doctor's responsibility to an individual and responsibility to society? Where are the limits of ethical research? Did (does) the (German) medical profession have too little respect for the human being? How can we increase this respect through medical teaching? What are the essential elements of a good relationship between the medical profession and the state?

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