

## Nazi Medicine—Part 2: The Downfall of a Profession and Pernkopf's Anatomy Atlas

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The immoral and criminal musculoskeletal experiments the Nazi regime conducted at the Ravensbrück concentration camp [7, 12] victimized approximately 80 women and 20 men, killing no fewer than 23 of them. These senseless experiments yielded no scientifically valuable data and were unusable

both because of moral concerns and egregious scientific deficiencies [7]. But Nazi physicians did make other biomedical research contributions [18, 21, 35] during and after the World War II. What should be done with this material? Can we justify its continued use? In this essay, the second of two parts, I explore one example of this dilemma, Eduard Pernkopf's *Atlas of Topographical and Applied Human Anatomy* [6, 18, 20, 28, 41].

Any use of knowledge derived from criminally conducted Nazi biomedical research has generally brought with it condemnation from the medical community [11, 22, 33-36] because using such data corrupts the institution of medicine itself. Indeed, the crimes committed under the Nazi regime in the name of medicine and science continue to haunt the biomedical community. Medical eponyms associated with Nazi physicians who took part in human experimentation have fallen out of favor; Reiter's syndrome, named after Hans Reiter, a German physician convicted of war crimes for his medical experiments at the Buchenwald concentration camp [35], is now designated reactive arthritis. More recently, concerns have been raised about Hans Asperger, whose

name has been synonymous with autism; it appears he was not a principled opponent of German national socialism as once was believed [11]. At least one prominent historian of the time has recommended that Asperger not be honored by having his work credited eponymously [32]. Less subtle and perhaps more important is the question of what to do with Pernkopf's atlas.

### More Than "A Slippery Slope"

On March 12, 1938, Nazi Germany annexed Austria. Three days later, the ardent, outspoken Nazi, Eduard Pernkopf, who at the time was professor of anatomy at the Vienna Medical School and the director of the Vienna Anatomy Institute, became Dean of the Vienna Medical School [13-18]. Within weeks, the school "cleansed" itself of Jews—153 of the 197 academic staff were dismissed because of their or their spouses' Jewish origin or political dissent, including three Nobel laureates [8, 13, 18, 19]. Their medical peers did not oppose such a "cleanse" [13, 30].

This transformation—the downfall of German medicine before and during WWII—has been described as something of a "slippery slope" [16]. However, these physicians who accepted such a "cleanse" were not dragged against their wishes into acts they did not like; rather, they were active,

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*A note from the Editor-in-Chief: Part one of this two-part series examined the forced musculoskeletal experiments conducted on prisoners at Ravensbrück concentration camp under the Nazi regime during World War II. In part two, Dr. Bagatur discusses the downfall of the medical profession in Germany during the Nazi era and the ethical issues associated with publishing research by Nazi physicians, including the use of anatomic images depicting Holocaust victims. The author certifies that neither he, nor any members of his immediate family, have any commercial associations (such as consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article.*

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**Fig. 1** At his inaugural lecture as dean, Eduard Pernkopf donned a Nazi uniform with a swastika on his left arm, and the faculty greeted him with a Nazi salute, pledging allegiance to Hitler. (Published with permission from ÖNB Vienna: ÖGZ S 283/30).

willing, and enthusiastic participants in the atrocities, and they served the Nazi ideology without question. By 1936—3 years before the start of the war—45% of German physicians were members of the Nazi Party, the highest percentage of any profession [1, 15, 17]. The number is still more shocking given that 16% of German physicians were Jewish [2] (including 60% [1] of those in Berlin); since Jews did not join the Nazi Party, one surmises that most German doctors were Nazi Party members [17].

Again, German physicians who were members of the Nazi party were no innocent bystanders; they developed and implemented the Nazi racial theories that led to the Holocaust, sterilization, and euthanasia programs [30]. Many of these physicians benefited directly from the coerced human experiments in concentration camps and other unethical

medical practices made possible by the Nazi regime. Academic promotions were achieved on the basis of “discoveries” made in the course of Nazi criminal research endeavors [37], even as the careers of Jewish physicians were cut short [19] and their lives ruined or ended.

#### **Ethical Dilemma: Pernkopf and His Atlas**

Pernkopf openly defended racial hygiene and Nazi policies promoting extermination of genetically inferior elements [4, 18, 24, 25]. At his inaugural lecture as dean to a full amphitheater surrounded by Nazi regalia, Pernkopf wore a Nazi uniform with a swastika on his left arm. The faculty greeted him with arms raised in a Nazi salute, pledging allegiance to Hitler (Fig. 1).

After the war, Pernkopf spent 3 years in prison along with other prominent Nazi party members. In 1948, having been stripped of all titles and appointments, but still regarded as a great scientist at 57 years old, Pernkopf returned to work at the University of Vienna Medical School [13, 18, 39]. He was not the only one. Many perpetrators were never punished after the war. Hans Reiter, who admitted to killing 200 people with an experimental typhus vaccine, was never indicted, and died a free man at the age of 88 [35, 36]. Julius Hallervorden (for whom Hallervorden-Spatz syndrome was named) performed research on the brains of nearly 700 “euthanized” individuals and was present at the killing of more than 60 children and adolescents [33, 34]; he, likewise, was never indicted and regained his status as a department head after the war and worked at the Max Planck Institute in

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Frankfurt, Germany [33, 34]. He even published 12 scientific articles based on this material after the war and received an honorary doctorate, ultimately retiring as an emeritus professor [33, 34]. In fact, most voluntary Nazi doctors returned to practice medicine; many other prominent Nazi academics regained prestigious positions as well [10, 13].

Although the Vienna Medical School never restored Pernkopf's position, he was given two rooms at the university, and so he continued to work on his four-volume anatomy atlas until his death from a stroke in 1955 [4, 18, 39].

While some consider his atlas an artistic masterpiece, others see it as another reminder of the horrors perpetrated by Nazi physicians [21, 39]; Pernkopf performed anatomic research on the cadavers of individuals executed under the Nazi regime [4, 18], and it has been suggested, plausibly, that bodies of concentration camp victims were likewise used [39], although this has not been proven.

Pernkopf organized the atlas, wrote the detailed text, supervised the preparation of the dissections by his assistants, and directed the artists in their paintings. Distinguished Viennese artists Erich Lepier, Ludwig Schrott, Karl Endresser, and Franz Batke contributed to the atlas during its 27-year creation and produced more than 800 watercolor paintings [39]. The atlas is a rare example of genuine scientific work performed by Nazi physicians [18, 39].

Like Pernkopf, the artists who worked on the atlas were active Nazi party members, often promoting the affiliation with pride [39]. Between 1938 and 1945, Lepier repeatedly incorporated a swastika into his signature on his illustrations. He signed his paintings "Lepier Wien" ("Lepier Vienna") with a swastika between the two words and sometimes only

"Lepier" with a swastika at the end. Likewise, Endresser sometimes wrote the two "s" letters in his name like the double lightning bolt insignia of the SS [4, 20, 39]. Batke also contoured the "44" in the date 1944 to emulate the characteristic double-S iconography of the SS [39]. The Nazi symbols persisted through the 1964 English version of the atlas, only to be airbrushed out in subsequent editions [8]. When Pernkopf returned to Vienna after his imprisonment, his four original artists joined him, although they no longer used Nazi symbols in their illustrations; Endresser changed his signature.

### Demanding Answers

The signatures with Nazi symbols, coupled with images in the atlas of a circumcised and cachectic man shorn of hair caused some to suspect that Pernkopf used cadavers of Jewish concentration camp victims for dissections [4, 5, 21, 25, 31]. In 1995, fueled by an article that recounted the stormy days of Vienna Medical School's World War II past [13], medical professors from North America [22, 23, 26, 27, 38], Canada [30], and the United Kingdom [14] re-examined Pernkopf's history and his involvement in medical atrocities [21].

"Pernkopf worked on the publication of an anatomic atlas, which contained material from children killed in a Viennese hospital," Edzard Ernst MD wrote. "His Institute of Anatomy also used the corpses of executed persons for teaching purposes; part of this material is believed to be still in use at the university. As in Germany, such atrocities were later 'forgotten,' 'swept under the carpet,' or justified by their medical (wartime) necessity" [13].

Is it ethical to use an anatomy atlas created by a criminal Nazi with

illustrated dissections of cadavers who may have been victims of the Nazi terror [23, 38]? Articles in *JAMA* [22, 23, 26] and *Annals of Internal Medicine* [27] both argued that the University of Vienna, and all libraries should remove the atlas from their shelves and asked the publishers to halt publication. Yad Vashem, Israel's official Holocaust memorial, also demanded that the University of Vienna investigate the precise origins of the specimens used for the drawings in the atlas and asked for a commemoration of Nazi victims, as well as a notice about Pernkopf's Nazi past in future editions of the atlas [18, 22, 23, 26, 27, 38].

Defenders argued that the atlas should continue to be published with an acknowledgment documenting Pernkopf's association with the Nazis and commemorating the victims [5, 18, 22, 29, 41].

Under substantial international pressure, the University of Vienna conducted an investigation to clarify whether, in fact, the bodies of victims of the Nazi regime were used for research [4, 25]. The final report, published a year later, found that at least 1377 bodies of executed persons from the Vienna city prison were delivered to the institute between the annexation of Austria on March 12, 1938 and the end of WWII, but there was no evidence that Pernkopf used concentration camp victims as cadavers. Seven of the 1377 bodies were of Jewish descent, but they were not from concentration camps; they were from the city prison, the report claimed. Whether these seven Jews were used as models for the paintings in the atlas is not known. From the report:

*The suspicion that some illustrations may have been modelled on bodies from Jewish concentration camp victims, based on an appearance*

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of a shaven head, cachexia, or circumcision could not be substantiated by the commission. With the possible exception of the seven executed Jewish victims referred to earlier, the commission found no evidence that any of the pictures were based on Jewish models (it must be pointed out that the anatomical preparation procedure causes shrinkage of the prepuce, mimicking circumcision) [4].

The names of the individuals used for the illustrations in Pernkopf's atlas could not be identified. The investigation also revealed that there were about 200 anatomical and tissue specimens from those executed from the Vienna city prison in some departments of the medical school. These specimens were later buried in a grave of honor in the Vienna Cemetery in 2002 [4, 18, 30].

In an interview, Werner Platzer, an anatomist who had completed the fourth volume of the atlas after Pernkopf's death, believed Pernkopf produced the atlas without using the bodies of executed Jewish people. "Please consider that Pernkopf was a National Socialist. As such, it was strictly prohibited for him to consider a Jew as a human being [24]," Platzer argued.

Such remarks provide an insight into the mindset of Nazi physicians of this generation.

### History Lives On

In the two decades since the University of Vienna investigation, the ethical debate has subsided somewhat, with most recommending the atlas' continued use as a way of honoring the victims of the Nazi regime [6, 18], while also reminding doctors of the horrors that the Nazi medicine imposed [6]. Medical ethicists naturally cite Pernkopf's atlas when discussing moral

dilemmas in medicine, but given the many quality alternatives available, and the fact that the atlas is no longer on the market [6], it is somewhat surprising to learn that physicians still use it as a medical teaching tool. Consider the results of a survey published just this year that asked neurosurgeons performing peripheral nerve surgery about the type of anatomical resources they used. Eighty-one percent reported the use of anatomical atlases, and 12% indicated that they still use Pernkopf's atlas [41].

After the war, the German and Austrian medical profession avoided its Nazi past at almost any cost [4, 13-16, 18, 25], and Nazi crimes generally were attributed to a small group of 400 criminal physicians, not to the entire profession [13, 14]. Even so, in 2012, the German Medical Association apologized for medical atrocities under the Nazi reign, marking a crucial change in the recognition of the atrocities perpetrated by its members. The American Medical Association (AMA) stated that Holocaust remembrance is an obligation for the entire medical profession [40].

The AMA is correct on this point. Although more than 70 years have passed—indeed, perhaps because that time has passed—we must educate the next generation of biomedical scientists and orthopaedic surgeons about this shameful part of our profession's history. The history of the medical atrocities committed under the Nazi regime must be told and retold to honor and commemorate the victims of the Nazi regime, and to promote our profession's fundamental humanism in a world where genocide, state-ordered torture, and physician-supervised state executions continue to this day [3, 9]. Medicine must be a moral enterprise.

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