Hitler's Penicillin

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Hitler’s Penicillin

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ABSTRACT During the Second World War, the Germans and their Axis partners could only produce relatively small amounts of penicillin, certainly never enough to meet their military needs; as a result, they had to rely upon the far less effective sulfonamides. One physician who put penicillin to effective use was Hitler’s doctor, Theodore Morell. Morell treated the Führer with penicillin on a number of occasions, most notably following the failed assassination attempt in July 1944. Some of this penicillin appears to have been captured from, or inadvertently supplied by, the Allies, raising the intriguing possibility that Allied penicillin saved Hitler’s life.

The fact that Germany failed to produce sufficient penicillin to meet its military requirements is one of the major enigmas of the Second World War. Although Germany lost many scientists through imprisonment and forced or voluntary emigration, those biochemists that remained should have been able to have achieved the large-scale production of penicillin. After all, they had access to Fleming’s original papers, and from 1940 the work of Florey and co-workers detailing how penicillin could be purified; in addition, with effort, they should have been able to obtain cultures of Fleming’s penicillin-producing mold. There seems then to have been no overriding reason why the Germans and their Axis allies could not have produced large amounts of penicillin from early on in the War. They did produce some penicillin, but never in amounts remotely close to that produced by the Allies who, from D-Day onwards, had an almost limitless supply.

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The importance of penicillin to the Allied cause can be gauged from the following quote: “The results achieved [from using penicillin] led to a saving of manpower and reduction in wound-complications and recovery in hospitals, in supplies of drugs and equipment, in surgeons and nurse time which it is impossible either to compute or to appreciate” (Fleming 1946, 163). Penicillin also led to a particularly marked reduction in the number of Allied soldiers inactivated by venereal disease. Axis doctors, in contrast, had to rely on the sulfonamides, against which gonorrhea- and syphilis-causing bacteria had largely become resistant.

One reason why the Germans were slow to develop penicillin was their long-standing commitment to the sulfonamides (Green and Covell 1953). Gerhard Domagk had demonstrated the antibacterial properties of Prontosil, the first of the sulfonamides, in 1932. Further studies, notably by Leonard Colebrook at Queen Charlotte’s Hospital in London, showed that the sulfonamides were effective against a number of bacterial infections, including puerperal or childbed fever; one sulfonamide, Marfanil, was particularly useful for treating gas gangrene. The sulfonamides, however, often proved toxic, and bacteria readily developed resistance to them. Despite these limitations, the sulfonamides were effective antibacterial agents, making it seem to the Germans that there was no overriding need to replace them with penicillin. Although some German scientists and administrators did recognize the importance of penicillin, their efforts were frustrated by infighting, greed, and poor organization. There is no doubt that this failure to develop penicillin was a major contributory factor in the defeat of Nazi Germany.

While Axis troops died in the thousands from want of penicillin, the new antibiotic was used on Adolf Hitler, and as we shall see, there is evidence to suggest that it may even have saved his life.

Allied Concerns About the Release of Information on Penicillin

In hindsight, the military potential of penicillin is so obvious that it seems amazing that Allied information on the new antibiotic was not severely restricted immediately after war broke out, in late 1939. In fact, it was not until 1941 that the Allies began to recognize the damage that might result from their laissez-faire attitude towards penicillin. On December 19 of that year, President Roosevelt set up an Office of Censorship. The following day, Dr. Robert Coghill, Chief of Fermentation at the Northern Regional Research Laboratories in Peoria, Illinois, was informed that, since penicillin would be of obvious use to the enemy, any information relevant to its production and use should be severely restricted. This secretive American attitude towards penicillin contrasted markedly with the more relaxed approach taken in Britain, where concerns were expressed about the ethics of restricting information on penicillin. Major General James G.
Magee, Surgeon General to the U.S. Army, came to the conclusion that neither international treaties nor the accepted rules of war allowed for any distinction between the treatment of friendly and enemy wounded. On the other hand, he believed that a distinction could be drawn between keeping details of penicillin production secret and restricting its use in the treatment of enemy soldiers (Clark 1985, 66).

By 1941, scientists in continental Europe were beginning to take an interest in penicillin. Early in that year, the Ciba Company asked Ernst Gaumann of the Swiss Federal Institute of Technology to develop penicillin. Ciba scientists wrote to Florey asking for a culture to transmit to their Swiss associate. Florey contacted Sir Edward Mellanby, head of the Medical Research Council, and expressed the view that “It seems highly undesirable that the Swiss should have it as this would mean that the Germans get it.” Florey then went on to inform Fleming that the head of the U.K. National Culture Collection had been told not to supply cultures to foreign scientists. Florey, clearly worried that Ciba would approach Fleming, asked Fleming if he knew of anyone else who had a culture and therefore needed to be warned not to supply it to others (Florey 1941); in the event, the Germans never obtained a culture of Fleming’s mold from Allied sources.

**German Attempts to Develop Penicillin**

During 1942, the directors of the Heochst Dye Works decided to investigate penicillin. At first only two people were involved, but this soon increased to three—although this third worker was only temporarily released from the army. At this point, the Germans knew little about the media and growth conditions required and, somewhat surprisingly, had difficulty obtaining a culture of Fleming’s mold. The Allies were well aware of these attempts made by the Germans to develop penicillin and must have been heartened to learn of their lackluster approach, especially their initial failure to develop deep fermentation (Shama 2003). In this process, pioneered mainly by American scientists, the penicillin-producing mold is grown in large vats of aerated culture medium. Deep fermentation proved to be far more efficient than the earlier, British method, based on growing the mold on the surface of liquids in vast numbers of small bottles.

By the end of 1943, the penicillin team at Hoechst had grown to 10, and they were making penicillin in shallow jars in what was a large laboratory, rather than a factory. In 1944, deep fermentation was in use, and production had increased from 100,000 units in 1943 to 10 million, with the latest strains producing 50 units per milliliter. By the time of the Normandy campaign, however, Hoechst could only produce enough penicillin to use as a dusting on superficial wounds, and it was not until October 1944 that the first ampoules of 20,000 units became available (Williams 1984).
The first patient to be treated using German penicillin was a woman in Edenkoben Hospital (under the care of the wife of a Hoechst’s penicillin chemist), who had been suffering from what would have otherwise been a fatal case of generalized sepsis following mastitis (Baumler 1965, 41–63). This, and other successes, finally encouraged the Germans to plan for an energetic expansion of penicillin production beginning in January 1945. By March, an urgent request for information came from Berlin asking how many tons of penicillin could be produced per day. Although fanciful, this request shows that the officials had at last awakened to the new drug’s potential, but it was far too late; a few days later, an American Army Officer declared that the Hoechst works had been confiscated.

**WARTIME DEVELOPMENT OF PENICILLIN IN N A Z I-OCCUPIED C O U N T R I E S**

Although the Germans had access to the skills and resources of the scientific communities of the countries of Europe they occupied, the contribution made to German penicillin production by such scientists appears to have been minimal; as a result, only relatively small amounts of penicillin were ever produced in occupied countries during the War. It has been claimed that the Dutch resistance movement and the French Maquis also tried, without success, to develop penicillin (Clark 1985, 68). A penicillin preparation called BF510, Mykoin, was developed by a team of Czech scientists working at the Leciva Company in Prague, while in Holland, the noted “yeast factory” at the Technological University of Delft was rumored to have worked on penicillin during the War (Kamp, La Riviere, and Verhoeven 1959, 37; Kostir 1990). The Dutch pharmaceutical firm of Koninklijke Nederlandse Gist- en Spiritus-Fabriek N.V. also produced penicillin G (benzyl penicillin—known by them, until 1945, as Bacinol) by surface fermentation. Meanwhile, the French began research on penicillin on January 7, 1943, when the Scientific Director of Rhone Poulenc obtained a penicillin-producing mold from the Pasteur Institute in Paris. By August 1943, 40 milligrams of crude penicillin were being produced, and from October 1943 to December 1944, Rhone Poulenc produced some 5 million units.

**DID PENICILLIN SAVE HITLER’S LIFE?**

You can never know how much I am indebted to Morell. He saved my life in 1936. I was so far gone that I could scarcely walk, I was given totally wrong treatments. Grawitz and Bergmann too, they both had me starving. Finally, I was just drinking tea and eating biscuits. Then came Morell and he cured me.

Adolph Hitler spoke these words in 1944 (Irving 1983, 30–31). They describe how an obscure doctor, Theodor Gilbert Morell, saved one of the most murder-
ous men in history (Figure 1). Born July 22, 1886, in Upper-Hesse, Morell, the son of a primary school teacher, lived most of his adult life in the highly privileged position of Hitler's personal physician. Hitler was so impressed by Morell that in early 1944, he awarded his personal doctor the civil version of the Knight's (Iron) Cross and even encouraged Morell to masquerade as the discoverer of penicillin, which, it was claimed, was stolen from him by British Intelligence.

Morell was always on the lookout for novel treatments with which to impress his infamous patient, and although his medical theories and practices pandered to the Führer's chronic hypochondria, on a number of occasions they also probably saved his life. As we shall see, Morell used a variety of antimicrobial agents, including penicillin, to treat Hitler; most of the evidence for this can be found in David Irving's *The Secret Diaries of Hitler's Doctor* (1983).
Although Albert Speer said of Morell that “He is a screwball only interested in money,” it seems that Morell did alert Hitler to penicillin and urged development of the drug (Snyder 1976). However, he played no direct role in the development of penicillin. One of Hitler’s doctors, Karl Brandt, would comment after the war, “Let me just say this: when I drew Hitler’s attention years earlier to the vast importance of the work being done on penicillin in America and Britain, Morell had not the foggiest notion what I was talking about and afterward confused it with phenacitin—something completely different” (Irving 1983, 67).

The following entry for July 20, 1944, appears in The Secret Diaries of Hitler’s Doctor:


“Patient A” is, of course, Hitler, and the wounds referred to were the result of the unsuccessful assassination attempt by Claus von Stauffenberg earlier that day. Morell attended to Hitler on the evening of the bomb attack and helped dress his wounds; he also gave the Führer an injection (Toland 1976, 799). Hitler even joked with him, saying that he was invulnerable and immortal. Surprisingly, this quote, and the recognition that Hitler was treated with penicillin immediately after the Stauffenberg assassination attempt, has largely gone unnoticed.

Where did Morell obtain the penicillin he used to treat Hitler? One possibility is that the preparation was not in fact penicillin, at least in a purified form. Professor Ernst Schenck, who knew Morell, is quoted as saying that the penicillin Morell used was some “vacuum-dried mold culture medium processed into powder with talc,” implying that it was next to worthless. However, Morell also had access to other supplies of penicillin, including so-called “Penicillin Hamma” (made by the company of that name), a commercial preparation that was developed independently of Hoescht penicillin. (Irving 1983, 67).

Penicillin Hamma was produced as the result of a circular dated December 6, 1943, from the Reich health authorities, requiring that the medical community should begin intensive research into penicillin and related antibiotics. On January 10, 1944, Morell’s private Berlin laboratory began to investigate penicillin’s effect on animals, and on February 14, Morell received the news that “twenty portions from twenty litres of penicillin” had already been produced. On February 21, Morell discussed penicillin production with Martin Bormann; Hitler’s Deputy informed Morrell that the Führer had ruled exceptionally that Hamma Inc. could set all of its research expenses against tax.

Morell also had notional control over a small penicillin-producing operation located in “The Professor Theo. Morell Private Research Laboratory.” Although pitifully small amounts of penicillin were produced here, there may have been just enough available for Morell to treat one exceptionally important patient.
Morell had available to him another, somewhat surprising, source of penicillin (Irving 1983, 70). It seems that the German Surgeon General Dr. Siegfried Handloser had managed to obtain a few ampoules of captured American penicillin. Another doctor close to Hitler, Erwin Giesing, demanded that Morell use this penicillin to treat Hitler’s Chief Wehrmacht adjutant, Rudolf Schmundt, who had been hideously injured in the bomb attack; this Morell declined to do. Allied airmen were known to carry penicillin, but the suggestion that this was the source of penicillin used to treat Hitler may have been used as a cover for another, even more reliable source. Surprisingly, from 1943 onwards, Allied penicillin was supplied to a number of European countries and even as far away as Afghanistan. Some of these countries, like Sweden, Switzerland, and Portugal, were neutral, but samples of penicillin could nevertheless have found their way in diplomatic bags to Berlin. Even more surprisingly, the Allies sent penicillin to pro-Axis countries such as Spain, where, for example, it was used to treat Allied prisoners suffering from frostbite (Clark 1985, 83–84). We cannot be certain that Morell used Allied penicillin to treat Hitler, but it seems more than likely that some of the pure penicillin sent to countries like Spain would have been misdirected and found their way to the physicians of high-ranking people, including Morell. The fact that Morrell refused to use the precious drug on Schmundt could suggest that he was saving it for Hitler. It certainly seems unlikely that he would have passed up the opportunity of furthering his position at Hitler’s court by refusing to treat the Führer with what he knew was a miraculously effective drug. Even if Morell had continued to refuse to use the American penicillin, another of Hitler’s doctors would almost certainly have used it to help save Hitler’s life.

Of course, the question that needs to be addressed is, were the injuries Hitler sustained in the July 20 assassination attempt really life-threatening? Morell clearly thought them to be so, since he used some of his precious supplies of penicillin to treat Hitler. During the bomb blast Hitler received cuts to his forehead and abrasions, burns, and blisters on his arms and legs, some of which were full of wooden splinters; his most troublesome problem was that the blast had burst his eardrums, leaving him partially deaf (Kershaw 2000, 674). Although relatively minor, any of Hitler’s injuries could have become infected with bacteria and led to septicemia. The wood splinters were particularly worrisome because they could have carried or harbored septic bacteria. An example of how deadly such injuries could be in the absence of penicillin treatment is provided by the case of Reinhard Heydrich, the aptly named Butcher of Prague, who survived the direct effects of a similar bomb blast but later succumbed to septicemia. In Heydrich’s case, horsehair from the seats of the car in which he was traveling was blasted into his body, bringing with it a fatal bacterial infection.

Morell also makes several references to his use of penicillin on patients other than Hitler. In August 1944, a certain Paul Schönnfeld wrote to Morell recall-
ing how Morell had treated him with penicillin during June, and how his sup-puration had vanished the next day. Some months later, a self-satisfied Morell wrote to the sister of a Luftwaffe officer killed in action: “I can still see him standing before me with his boyish smile as I treated his leg injuries with penicillin” (Irving 1983, 67). In early September of the same year, Morell visited another patient with a high fever and treated him with intramuscular injections of penicillin. His patient’s shivering subsided and his fever reduced (Irving 1983, 183).

Although Morell used penicillin to good effect, he seems never to have been content using a single drug on patients, particularly Hitler; instead he used homoeopathic remedies and some non-mainstream therapeutic approaches. However, he was particularly fond of treating Hitler’s minor infections and colds with a range of sulfonamides. He even treated Hitler with a very toxic sulfonamide, called Ultraceptyl (Irving 1983, 71, 149). His fondness for using this hazardous drug no doubt related to the fact that he owned shares in its manufacturer, Chinoin of Budapest.

Morell also treated Hitler with a somewhat unconventional antibacterial agent, neopyocyanase (Irving 1983, 219–23). Neopyocyanase, a derivative of pyocyanase, is one of a number of products produced by the bacterium *Pseudomonas pyocyaneus* that have long been known to exhibit antimicrobial activity (Waksman 1947). Morell’s diaries show that through late 1944 he used neopyocyanase (in the form of Neo-Pyocyanase Südmedica) to treat Hitler (Irving 1983, 223). He frequently used this antibacterial agent to treat the Führer’s throat and tonsil infections, especially when his patient could no longer tolerate Ultraceptyl. Morell describes how, after he applied neopyocyanase to Hitler’s nostrils and nasal cavities, his patient’s voice, which had been hoarse, was much improved. On October 27, 1944, Morell examined Hitler’s pharynx and noted that the left wall and tonsil were reddened and infected. Prior to antibiotics such “strep throats” could be very painful and could lead to septicemia and even death. Morell again daubed both tonsils with neopyocyanase. After he had repeated this treatment, Hitler’s throat infection was cured; the Führer was apparently so impressed by this treatment that he insisted that Morell keep supplies of neopyocyanase near him at all times.

It was one of Morell’s more unusual treatments that first brought his skills to Hitler’s attention. During the summer of 1936, Hitler was suffering from a bout of worsening stomach pains, so agonizing that he could not work by day or sleep at night. Morell was brought in and over the Christmas period of 1936 he made the bold promise “I’ll have you healthy again in less than a year” (Irving 1983, 23). Morell had long been interested in the bacteriology of the human colon, and he suspected that the bacterial flora of his patient’s intestine was at the root of his health problems. His first step was to send a fecal specimen to Professor A. Alfred Nissle in Freiburg. Nissle had developed a particular strain of the bac-
terium, *Bacillus coli-communis* (now known as *Escherichia coli*), that colonized the intestinal tract. The bacteriological division of the chemical company Hageda Pharm. in Berlin started mass-producing the strain under the name “Mutaflor.” Nissle’s tests showed that Hitler’s intestine was full of “bad” so-called dysbacteria (Irving 1983, 120). Mutaflor was given to Hitler in the hope that it would alter his stomach microflora and rid him of dysbacteria. Morell’s use of Mutaflor appears to have worked, since when he had Nissle check Hitler’s fecal sample, it was reported normal (Irving 1983, 30–31). After six months of treatment, Hitler was eating normally, was no longer suffering stomach cramps, and had regained his lost weight; his eczema had also disappeared and, after nine months, he pronounced himself fit again. As a reward, Morell and his wife were given VIP tickets allowing them to attend the Party rally at Nuremberg in September 1937. In later years Hitler commented on his physician’s curative prediction: “That’s what Morell said: one year!”

Did Morell’s antimicrobials save Hitler’s life, or is the idea merely fanciful? It is easy to forget that before the introduction of antibiotics people died from the most commonplace infections. Any one of Hitler’s apparently trivial sore throats, which Morell treated, could easily have turned to septicemia and led to the Führer’s death; Morell’s use of penicillin after the ill-fated assassination attempt of July 1944 arguably did save Hitler’s life.

Like many Nazis, Morell was a self-serving opportunist. Although he was content to pump Hitler full of narcotics and dubious supplements, he was by no means a complete quack. Perhaps had the outcome of the war been different, or had fate allowed him to treat Roosevelt or Churchill, he might have been regarded as a far-sighted pioneer in the use of antimicrobials, including penicillin. In the event, he succeeded in keeping alive one of the most evil men in history.

After the war, Morell was arrested by the Allies and, although not indicted for war crimes, spent time in captivity in Dachau concentration camp. He died, his assistant would reflect, “like a stray dog,” at a clinic in Tegernsee, aged 58.

**References**


