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From the desk of
Alexander J. Dessler

Von Braun is one of ~~my~~ my heroes because of his leadership in the Apollo Program. His leadership was "hands on", and I talked to enough people to know it was inspiring. At Huntsville the people, down to the janitors, did not have a civil service job, they were an integral, needed, part of the team. The team that would send humans to the Moon!

That explains why the F1 engine worked, so the first stage used only 5 engines instead of 30. 0.11.18

Every! Saturn V made it into orbit - again, zero failures. 13 launches with zero launch failures. At that time, no one else could do that, certainly not the Russians.

ajd

New in paperback

The Language Instinct by Steven Pinker. HarperPerennial, \$14. "Here at last is a marvellously readable book about language, written by a real expert. Pinker tackles with wit and erudition the kinds of questions everyone asks about language. . . [to which] he brings not only an expertise in linguistics and psychology and a wide knowledge of biology, but also an ability to understand the ordinary person's linguistic hang-ups and to shake them loose with gentle ridicule. . . With its wealth of examples, its flawless typesetting, its wide-ranging bibliography and its irresistible good humour, Pinker's book is certain to increase its readers' respect for the amazing natural phenomenon that the author and his colleagues have made their life's study (Christopher Longuet-Higgins, *Nature* 368, 360; 1994).

Are We Alone? Implications of the Discovery of Extraterrestrial Life by Paul Davies. Penguin, £5.99. In his preface to this slender book, which is based on lectures given at the University of Milan in 1993, the author mentions that an estimated 170 books speculating about the existence of extraterrestrials were published before 1917. He now attempts "to rekindle this debate, and place it in a modern scientific context, by charting what aspects of contemporary science, and of our belief systems in general, are at stake".

The Astonishing Hypothesis: The Scientific Search for the Soul by Francis Crick. Simon and Schuster, £6.99. "An account of this dramatic enterprise by one of the greatest living biologists, written with clarity and charm. . . We are guided through the delightful intricacies of the psychology of vision; attention and memory; the structure of the brain; and the workings of its neurons. . . All this leads to potentially important speculations, the upshot being that consciousness remains mysterious. But Crick will continue to contemplate the future of brain science — the detailed and comprehensive study of neurons" (Richard L. Gregory, *Nature* 368, 359; 1994).

The Naturalist in Britain: A Social History by David Elliston Allen. Princeton University Press, \$16.95, £11.95. First published in 1976, this pioneering book has established itself as a key resource for historians of science and an excellent introduction to natural history for the general reader.

lines, such as the famous HeLa line established in 1952, were becoming known and these were, and still are, growing indefinitely.

Against this background, those unfortunate whose cultures of normal cells invariably died out, as they must have done, found themselves in a fix like the courtiers in Hans Andersen's classic tale of "The Emperor's New Clothes". Persuaded by the trickster tailors that failure to see the nonexistent cloth was proof of being unfit for office, the courtiers played along with the deception. Conventional wisdom held that cultures died only because they were not properly cared for. Who was going to trumpet their failures?

Well, Hayflick and Moorhead did. But they took care to design an experiment of elegant simplicity to prove their point. By growing mixed cultures of old and young cells they showed that the old cells died while the young thrived. The old and young cells were of different sexes and could be distinguished by their chromosomes. Conditions were the same, so the demise of the older cells was not through contamination or lack of care.

Other laboratories were quick to confirm the existence of the limit. It was soon shown that the number of cell doublings that a culture could grow through declined with the age of the cell donor. This supported Hayflick's notion of a link to the ageing process. Yet, despite more than 30 years of research, we still do not know exactly what causes the Hayflick limit, nor do we yet know the real nature of the link to the ageing process. Incidentally, it now seems likely that Carrel's culture was, wittingly or unwittingly, topped up with fresh cells.

Ageing is more than a matter of just running out of cells. The brain, for example, depends on neurons that early in our lives stop dividing but then continue to work perfectly well for decades, until they too age and die. Similarly, Hayflick's book ranges well beyond the confines of the limit, providing a comprehensive review from one of the pioneers of modern biogerontology. Written in clear, nontechnical language, it is an excellent introduction to the scientific and demographic literature on this multifaceted subject.

The first part of the book looks at the elusive problem of satisfactorily defining ageing. Hayflick compares species that age and those, such as lobsters, that he suggests do not. It can be hard to tell, especially if one has to wait decades to find out. A valuable point that Hayflick makes well is how the notion of ageing can vary according to the level at which the process is viewed. For example, bristlecone pines and giant sequoias may be very long-lived, but none of their cells lives as long as a human neuron.

Following a fact-filled section on the demography of ageing in the United States, Hayflick treats us to a thorough analysis of how the ageing process is played out in the human body. It is here that we find his account of the discovery of the limit. He moves on to review the results of the famous Baltimore Longitudinal Study of Aging, which catalogues how a group of dedicated volunteers have aged through time. The main message is that there is no general pattern of ageing applicable to all our organs: a person's rate of ageing may vary significantly from what might be predicted from the averages.

Theories of ageing receive broad coverage, from evolutionary theories through to specific molecular theories. There is a growing consensus that ageing happens through gradual accumulation of random changes or errors, perhaps because of evolved limitation in organisms' maintenance systems. Hayflick agrees, and suggests that on the basis of this reasoning we may conclude that the ageing process is malleable, that we can understand how it happens and that perhaps we can tamper with it.

Woody Allen would no doubt approve. But let us not lose sight of the underlying message of Hayflick's book: biogerontology today is a respected science, but there is a great deal more research that needs to be done. Non-sensational, popular treatment of this emotive subject is to be warmly welcomed. □

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Research with a vengeance

David Edgerton

The Rocket and the Reich: Peenemünde and the Coming of the Ballistic Missile Era. By Michael Neufeld. Free Press: 1995. Pp. 368. \$21.95, £19.99.

THE nuclear-tipped ballistic missile, the key weapon of both the United States and the Soviet Union in the Cold War, owed much to German-speaking scientists and engineers of the Weimar era. In the few years between the Second and the Third Reich, Germany was a great centre of artistic, musical, scientific and technical innovation. Weimar Germany saw, for example, an enthusiasm for spaceflight, and experimentation with rockets on a scale not found anywhere else. But the Third Reich was itself a great centre of

innovation, and it was the German army, the Nazi party and the *Schutzstaffel* (SS) that gave the world the ballistic missile.

The study of the relationship between science, technology and society in Nazi Germany is not merely a parochial concern of German historians but is central to world history. This is not simply a reflection of the importance of German technology: one cannot study science and technology in the Third Reich without raising dangerous, difficult and important general questions about the relationship between knowledge and power, the moral responsibility of scientists and engineers, and the relationship between modernity and brutality. Michael Neufeld (of the National Air and Space Museum at the Smithsonian Institution in Washington DC) has written the first complete history in English of the story of the German liquid-fuelled rocket programme, which created the A-4 (better known as the Vengeance weapon 2, or V2), and he does not shy away from these issues.

The story itself is simple and chilling. The German army, which was dominated by gunners, was looking for alternatives to heavy artillery which was banned by the Versailles Treaty, and in 1929 started a small research programme with solid-fuel rockets. In December 1932, Baron Werner von Braun joined the project (his father was a member of the right-wing cabinet) and quickly became the technical director. By 1934 all public technical and military discussion of rockets was stopped by censorship and unofficial projects were suppressed. By the end of 1934 an A-2 was successfully launched (the A-1 had been a failure), and by early 1936 an A-4 ballistic missile was specified on the basis of extrapolation from the performance of the famous Paris Gun of 1918.

In the same year the German army began the construction of a research-and-development facility at Peenemünde on the Baltic coast. Before war broke out, and before the development was complete, the army had decided to build a massive factory at Peenemünde, but it was not until October 1942 that an A-4 was successfully launched. Production, first at Peenemünde and then, after an air raid in August 1943, largely at the 'Mittelwerk' near Nordhausen, yielded nearly 6,000 missiles; the equivalent, it has been estimated, of no fewer than 24,000 fighter aircraft. In September 1944 the first V2 was fired in anger; from then on, Mittelwerk was turning out around 20 missiles a day. By that stage of the war, the German

arms plants were highly dependent on slave labour, supplied by the growing SS empire; Auschwitz, we should remember, was a factory as well as an extermination camp. The V-2s were built by Russians, Poles, Belgians, Frenchmen and others under the control of the SS. At least 10,000 lives were taken in the process; this compares with the 5,000 people (mostly Belgians, and not Londoners) killed by V2s themselves. Very crudely, it took two

surely have been seen as monuments to technological lunacy.

Instead, in combination, the bomb and the rocket became the key technologies of the Cold War; and their wartime antecedents became the models for the development of new military technologies. After the war, some 100 Peenemünde engineers went to the United States, to work for the US army and later NASA (National Aeronautics and Space Administration). Von Braun's team designed the Jupiter ballistic missile, which put the first US satellite into orbit in 1958, and later the Saturn booster. Von Braun and his colleagues argued that their ambition had always been spaceflight, and that they were involved in the V2 programme only because that was the only way to the stars. Neufeld will have none of this. For most of his career, von Braun was a designer of ballistic missiles, a task he carried out with extraordinary energy, dedication and intelligence; talk of spaceflight was an extracurricular amusement. He also argues that von Braun was fortunate in being briefly arrested during the war because it helped him to present himself later as an apolitical engineer who fell foul of the Nazis: in fact his arrest was part of an SS campaign to take over the project. Von Braun, although never an active Nazi, was a Party member from 1937 and a member of the SS from 1940.

The V2 was an extraordinary technical achievement; in the 13 years from the start of the army project to the first successful flight, many intractable problems of engine design, guidance and supersonic aerodynamics had to be solved. The organizational and political work required to keep a project of this sort going in the difficult circumstances of war was immense. And the production and deployment of the missile were themselves considerable feats. All this Neufeld ably documents from the remaining archival material. But his important book is rightly dedicated to the enslaved workers who built the first ballistic missile with the intention that their sacrifice is never forgotten. □

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See *Nature* 372, 511 (1994) for Tom Gehrels's review of *Wernher von Braun: Crusader for Space*, a biography by Ernest Stuhlinger and Frederick I. Ordway III.



Cold War clan — from left to right, Dornberger (commander at Peenemünde), Axter (scientist), von Braun (with fractured arm) and Lindenberg (scientist).

human lives to make a V2, and each killed one person.

The total cost of the research, development and production, Neufeld estimates, was around US\$500 million (\$5 billion at 1990s prices), about one quarter of the cost of the Manhattan Project. And yet the destructive power of all the V2s was the equivalent of a single British air raid. The terrible irony is that we should be grateful to von Braun, Dornberger, Hitler, Speer and many others for their efforts. It should not be thought that this kind of irrationalism was confined to the Germans. The \$2 billion spent on the Manhattan Project produced two bombs whose destructive effects were no greater than those of contemporary fire raids on Japanese cities. Market forces would never have produced the V2 or the bomb; farsighted and all-knowing strategists would have stopped both projects very early on. Had preparation for war ended in 1945, the ballistic missile and the bomb would

Imperial War Museum

Of truth and consequences

Tom Gehrels

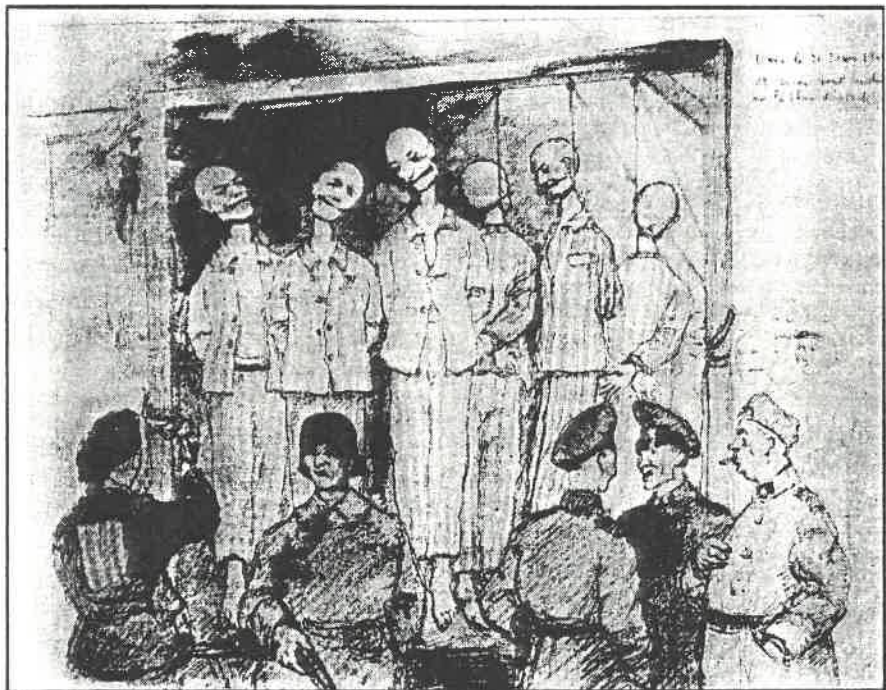
Wernher von Braun: Crusader for Space. Vol. 1: A Biographical Memoir. Vol. 2: An Illustrated Memoir. By Ernest Stuhlinger and Frederick I. Ordway III. *Krieger*: 1994. Pp. 375/147 \$42.50/\$29.50.

ON 20 July 1944 a major attempt was made on the life of Adolf Hitler. It failed, but it was clear that high-ranking military officers were involved. The Germans could no longer win the Second World War because of the onslaught by the Soviets from the east and by the Allies from the south and west, as well as the Allies' dominance of the air over the Nazi Reich. Despite all this, hundreds of Germans worked with zest and zeal at Peenemünde, the military rocket-development base on the Baltic coast, and in Dora Mittelbau, the mass-production rocket factory beneath the mountains near Nordhausen, in former East Germany, until nearly the end of the war, in support of Hitler and his *Schutzstaffel* (SS). They did so under the direction of Wernher von Braun, the pioneering rocket engineer. The reasons why they kept working are not explained in Stuhlinger and Ordway's book. Instead, the authors select events to defend and cover up von Braun, continuing to show him at his best until his death in the United States in 1977, when the extent of his wartime involvement began to leak out.

I recommend reading this book as a taste of history. It reminds me of the Nazi propaganda on which the occupied countries were force-fed for years: apparently thorough but selective, appealing but devious — and humourless. There is no new information that could possibly harm von Braun, such as the fact that his brother Magnus was stationed near Nordhausen where the 'Vengeance weapon 2' — the supersonic ballistic V-2 missile used against Britain in 1944 — was being built. Another close associate, Arthur Rudolph, was also at Nordhausen. Troublesome rocket-builders were hanged outside Rudolph's office. The authors disdainfully dismiss them as slave labourers who would have perished in some other concentration camp anyway. Not one photograph of the 60,000 workers appears in the separate volume of illustrations. Nor any of von Braun at Nordhausen, such as those I was shown in 1987 by the director of the museum there (and which, incidentally, are still not on public display).

The authors have missed a great opportunity to describe the drama and ultimate triumph of the human spirit. Among the workers at Nordhausen were some fine human beings, with far more guts and

integrity than von Braun and his cohorts who came from Peenemünde to guide the construction, let alone the supervising henchmen of the SS. That von Braun was a high-ranking SS officer is a remarkable truth that the authors gloss over: they say that his was an honorary position, not mentioning that the SS was a political organization whose members swore a blood oath of allegiance to Hitler and



Nazi principles. It seems naive for the authors to emphasize that von Braun was imprisoned by the SS on espionage charges for refusing to cooperate with Himmler over the V-2 project. One almost expects them to have us believe that a magnanimous Hitler father figure released von Braun.

Reading between the lines, one learns that a Faustian pact was made for von Braun's cooperation at Nordhausen. Nobody will be fooled by the excuse that von Braun was working for the "defense of his country". The Germans were the aggressors, seeking to conquer the world for a master race. Von Braun was well aware of this goal: he was raised in an aristocratic family, and his father, who had served as minister of education and agriculture in the Weimar Republic, quit his job when Hitler came to power.

Among the remarkable workers at

Nordhausen was Henk van Hoeve, the main supporter of Anne Frank, the Jewish diarist and concentration-camp victim. It was he who supplied Anne and her family with food while they were in hiding in Amsterdam. He was caught by the Nazis soon after they had been betrayed in 1944. Guido Zembusch Schreve was another worker there and is still alive today. Schreve had a daring record of resistance to the Nazi occupation in Western Europe, escaped to England, trained as a secret agent and parachuted back into France. He was also betrayed and ended up at Nordhausen, where he participated in one of the underground resistance groups, whose feats were astounding given the conditions under which they operated.

The challenge for the SS was, of course,

how to make such dedicated resistance fighters produce the very best and most intricate war machinery. The security forces achieved this by meting out cruel punishments if they suspected sabotage. Some of the alleged saboteurs were subjects of medical experimentation. Schreve tells how he was bitten on his legs by guard dogs; one leg was treated whereas the condition of the other was left to deteriorate. Men were tortured in a barrack known as the bunker, the prison within the camp where the ever-present *Sicherheitsdienst* (SD or security services) interrogated suspected saboteurs. Their screams were clearly audible from the adjacent parade ground where the barely clad workers stood at roll call for hours on end during that frightful winter. Hangings took place in the early days in the construction tunnel itself and, later, on the parade ground. Dragged to the gallows in

front of their friends, the agonized saboteurs would still manage to find the will to cry out in defiance before they were choked to death. So the Nazis tied little sticks tightly with wire in their open mouths. (These sticks are on display in the museum.) Finally, the bodies were hung above the victims' fellow workers, who, fearlessly and with determination, continued in their sabotage. Of the 5,789 V-2 rockets built, only 2,656 reached their target. Could not — should not — this book have been dedicated to these heroic men, not least to the 20,000 who were murdered?

Von Braun denied any wrongdoing for as long as he could, a front that prevails throughout the book. He is quoted, for instance, as saying that he never saw anyone die at Nordhausen, implying that no one died there. As late as 1975, von Braun and Ordway wrote: "The V-2s took their toll. . . they were responsible for more than 2,500 [Allied] deaths and great property damage". There is no mention of the 20,000 in the Nordhausen area. Stuhlinger and Ordway imply to the gullible reader that von Braun and the other Peenemünde engineers were rarely at Nordhausen. Simple logic, however, shows this to be impossible. The V-2s could not have been built without close supervision by the engineers. And, indeed, later in the book one learns that there were several engineers stationed in the Nordhausen area.

From the US court hearings of Rudolph in 1971 it seems likely that von Braun and his staff had suggested the use of concentration-camp labourers and participated in their management with full knowledge of the grotesquely inhuman conditions and punishments. French workers in the tunnels who are still alive today say that they knew von Braun, Rudolph and other designers by name at the time. Before he died shortly after returning home to Brussels from Nordhausen, Pierre Klein, a tunnel worker, told Schreve how he heard von Braun conclude a detailed inspection with the statement "Daß ist reiner Sabotage [that is clear sabotage]", at which 11 men were hanged.

It took the world a long time to find out what really happened, for who could ever believe such cruelty? Surely any decent human being would have refused to participate in such mass murder, even at the cost of his own life, let alone a scientific achievement.

Von Braun must furthermore share responsibility for prolonging the war. After 20 July 1944, Hitler kept up the Germans' hope and support by promising them a secret weapon. The Allies believed it to be an atomic bomb. Von Braun, however, had learned from Stuhlinger and others that a nuclear bomb programme had been abandoned in 1941. The secret

weapon was his V-2, and he was designing the A9, a longer-range rocket for bombing New York. Von Braun knew that such a weapon could not alter the outcome of the war; it would merely prolong confrontation and human suffering. Here is a war crime even larger than that of the 2,500 killed in the V-2 bombings and the 20,000 murdered at Nordhausen.

So the war ended and the Cold War began. It is all described in the book, including the move of von Braun and his rocket team to Fort Bliss, Texas, to work for the US Army. He was still only 33. In 1950, the team moved to Huntsville, Alabama, where von Braun later became director of the US Army's Ballistic Missile Agency. In 1958 he was chiefly responsible for the launch of the first US Earth satellite and between 1960 and 1970 he was director of the Marshall Space Flight Center, where he developed the Saturn V rocket for the launch of the Apollo craft that landed on the Moon in 1969. Many such facts are presented, but by now the reader wonders how selectively they were chosen and how fairly other pioneers in the space programme are treated. The authors strive hard to show how bright von Braun was and what a nice man he was — a great organizer who was, above all, devoted to his rocketry science. This whitewashing is used even in relating minor instances: it is implied that the astronomer Gerard Kuiper was a supporter of von Braun, whereas Kuiper in fact prevented von Braun from receiving an honorary doctorate, as Stuhlinger knows.

As with all Nazi propaganda, the book is full of clearly erroneous conclusions. The authors have failed to explain their remarkable leader. According to a Nordhausen survivor, it was likely that von Braun's obedience to authority was bred into him by strict schooling. Von Braun was probably too narrowly focused on his rocketry to have seen the Nazi truth and its consequences in the 1930s and to have then left Germany for the United States. Instead, he stuck to his course, and became more and more deeply involved in the military use of his science. The lack of integrity of von Braun and his cohorts is demonstrated by the fact that they never acknowledged what really happened during the war.

The authors' subject matter is an essential part of human history. Time marches on, as do curiosity and science. History should explain our mistakes as well as our accomplishments. Von Braun needs no phony defence, for he was a great man in his own scientific specialization; nor do we need to make hollow excuses for the Americans who indulged him with his rockets and instrumentation. What is needed is a more sophisticated historical perspective, which infuriatingly this befuddling book fails to provide.

Perhaps we can learn from this history. A few nuclear experts today want to use the threat of a collision of a comet or asteroid with Earth to develop new nuclear experiments. US scientists recently visiting a Siberian museum were shown one of the former Soviet Union's nuclear bombs. A question was asked: "Why did you make them?" The answer was, in part: "Because it was such an interesting problem". It is clear from this book that this is what drove von Braun. Should we ask ourselves whether we would have acted any differently from this man had we been born in his place? □

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Cassandra versus Pangloss

Stuart Pimm

Scarcity or Abundance? A Debate on the Environment. By Norman Myers and Julian L. Simon. Norton: 1994. Pp. 254. \$21, £16.95.

FOR anyone concerned with the future — ours, our planet's and of science itself — this book will be a compelling read. At its core is a debate held in October 1992 in New York. How panglossian is Simon? "We now have in our hands. . . the technology to feed, clothe and supply energy to an ever growing population for the next 7 billion years". To which Myers replies: "as many as 200,000 generations to come will be impoverished because of what we are doing [now]". From Simon, a professor of business administration at the University of Maryland, and Myers, an Oxford environmentalist, one might not expect compromise. The debate meets this expectation, while yielding fascinating insights into the public's use and perception of scientific knowledge.

This is no ordinary debate, for it cuts to the core of US policy. For Simon, the ultimate resource is people. The more we have, the better off we shall all be, for the more readily we will solve the problems we create. Western-inspired birth-control programmes are inexcusably "racist". Simon delights in getting across this message to the former Reagan administration, which then dramatically cut US aid to developing countries for such programmes. His only fear is the concern that people such as Myers express about the future.

Simon goes first, introducing a long list of examples showing that we've never had it so good and thus the future will be even better. Graphs of life expectancy, infant

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In Huntsville, Ala., Rocketeers' Legacy Has Complex Echoes

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Residents Embrace Scientists
Brought In After War,
But Nazi Past Still Haunts

By JEFFREY ZASLOW

HUNTSVILLE, Ala.—When the moon was full over Adolf Hitler's Germany, his rocket scientists would look up and dream about sending a man there. Today, some of those same scientists stand in this northern Alabama town, look skyward and think, "We did it."

How they got here, why they stayed and what they did for the U.S. space program and this community are matters of great pride in Huntsville today. These men's influences are everywhere—in the cultural institutions, the town's Bavarian-style architecture, the giant scientific-research park. And yet, people here know there's a dark side of the moon, too:



Ernst Stuhlinger

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When these scientists worked for the Nazi regime, their rockets were terror weapons, built with the help of slave laborers—political prisoners, Jews and POWs. Thousands of them died in the process.

"There is no way of changing history," says one of the scientists, Ernst Stuhlinger. "You have to take the facts as they happened." Now 91 years old, he explains that he always thought Hitler was "a madman," but he was told by those running the German rocket program: "Don't breathe a word about Hitler or you'll end up in a concentration camp, too."

Old men like Dr. Stuhlinger are the last 11 survivors of 118 German scientists brought here as self-described "prisoners of peace" by the U.S. government after World War II. Their mission: to help Hitler's rocket genius Wernher von Braun create the U.S. space program. About 200 of their descendants still remain in Huntsville, and residents have grown very protective of the men and their legacy. Many see current lessons: As the U.S. seeks help from professionals who were Baathists in Saddam Hussein's Iraq, Huntsville sees itself as proof that the U.S. can embrace former enemies to achieve greater goals. Today, with a population of 165,000, Huntsville calls itself "Rocket City USA."

Some outsiders, however, say Huntsville is a city in denial. Most, if not all, of

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Rocketeers' Legacy Has Some Complex Echoes

Continued From First Page

the 118 scientists worked alongside concentration-camp inmates or were well aware of them, says Linda Hunt, a former CNN producer who since 1983 has been investigating their Nazi-era activities.

One of those slave laborers, Alex Baum, 81, now lives in Los Angeles. He worked in the underground tunnels where the Nazis' infamous V-2 rockets were built. On many mornings, he recalls, prisoners were hanged at a tunnel entrance as a warning to would-be saboteurs. He says he spent six months in the tunnels without showering, changing clothes or seeing sunlight. The scientists observed or knew about all of this, he says. And even though the scientists have long contended that they were powerless to help prisoners, Mr. Baum says, "There's no excuse for them."

Huntsville's massive U.S. Space & Rocket Center honors the scientists, but the museum includes little about their World War II activities. The scientists were lauded in September by 400 locals at a dinner at the museum. "There's a whitewash going on in Huntsville," says Ms. Hunt.

The 118 Germans began arriving here, at a dormant Army base, in 1950. Huntsville was a fading town of 15,000,



Courtesy of NASA

The German rocket specialists, in a late-1940s photo, before the U.S. government brought them to Huntsville, Ala.

with an economy tied to cotton. Some residents had lost sons in World War II and were wary of the scientists. One gas-station owner posted a sign: "No Germans served here." Still, many others sensed that these foreigners could be the ticket to the city's future.

Indeed they were. More than 27,000 people now work here for the National Aeronautics and Space Administration or at 250 aerospace or defense companies. "Those Germans made Huntsville

into 'the New South' before anyone heard of that term," says David Cornutt, who designs software here for the International Space Station.

Mr. Cornutt is aware that about 80% of the scientists, including Dr. von Braun, were members of the Nazi Party. "You can't hold that against them because most had no choice," he says. He believes they "fled tyranny and became American patriots."

Mr. Cornutt, 44, went to grade school in the 1960s with several of the scientists' children, including Dr. von Braun's son, Peter. Their third-grade class went on a field trip to the office of Dr. von Braun, who jokingly apologized to the kids for having "such a heavy Southern accent." Most of the children's parents (including Mr. Cornutt's father) worked in the space program, and Dr. von Braun spoke about how proud he was of them.

Before Dr. Stuhlinger arrived in the U.S., all he knew of the American South was what he had read in "Gone With the Wind" back in Germany. Some of the scientists wondered whether the locals were "primitive people," he says, "but the Huntsvillians had a lot of hidden vigor" and embraced the rocketeers' space dreams.

and the city's planetarium. Dr. von Braun, who died in 1977, was the force behind the popular U.S. Space Camp here for children and adults. The scientists also made Huntsville a welcoming community for German businesses. Just this year, Siemens VDO Automotive Corp. took over a 1,800-employee electronics plant here.

The scientists' offspring also won acclaim for the city. One scientist's granddaughter, Margaret Hoelzer, 21, swam the backstroke at this year's Olympics.

Her grandfather, Helmut, who died in 1996, told her stories about how he was also at the mercy of the Nazis. Once, he and other engineers showed SS chief Heinrich Himmler a test rocket, and it blew up. "Himmler said, 'You have 24 hours to fix it, or else,'" says Ms. Hoelzer. "The scientists were terrified, but they ended up fixing it in time."

Gretchen Schafft, an American University anthropologist, has contacted about 50 people in the U.S. who were forced to work in the V-2 rocket program. She says several told her that it's "almost unendurable" to watch these scientists being glorified. She believes Huntsville parents have an obligation to tell children that the community has thrived in part because the U.S. space program was built "on a legacy of slave labor."

But many in Huntsville feel accusations of atrocities have been sensationalized. They're still upset that the Justice Department in the 1980s charged Arthur Rudolph, an acclaimed designer of Saturn rocket boosters, with responsibility for the deaths of thousands of slave laborers. He was production director at the V-2 factory. Rather than face a war-crimes trial, he returned to Germany, where he died in 1996.

Certainly, some in Huntsville recognize Dr. von Braun's flaws. "He was a driven opportunist who felt the ends justified the means when it came to advancing rocketry," says Bob Ward, a retired Huntsville newspaper executive whose biography of Dr. von Braun is to be published next spring.

here, at a dormant Army base; in 1950, Huntsville was a fading town of 15,000,

or at 200 aerospace or defense companies. "Those Germans made Huntsville

Mr. Cornutt, 44, went to grade school in the 1960s with several of the scientists' children, including Dr. von Braun's son, Peter. Their third-grade class went on a field trip to the office of Dr. von Braun, who jokingly apologized to the kids for having "such a heavy Southern accent." Most of the children's parents (including Mr. Cornutt's father) worked in the space program, and Dr. von Braun spoke about how proud he was of them.

Before Dr. Stuhlinger arrived in the U.S., all he knew of the American South was what he had read in "Gone With the Wind" back in Germany. Some of the scientists wondered whether the locals were "primitive people," he says, "but the Huntsvillians had a lot of hidden vigor" and embraced the rocketeers' space dreams.

Dr. Stuhlinger is renowned for his work, dating back to the 1940s, designing crafts that could reach Mars. He still uses the slide rule on which he made his calculations in Germany.

Most of the scientists became U.S. citizens in the 1950s, and over the years they helped create Huntsville's symphony and they built a Lutheran church

thrived in part because the U.S. space program was built "on a legacy of slave labor."

But many in Huntsville feel accusations of atrocities have been sensationalized. They're still upset that the Justice Department in the 1980s charged Arthur Rudolph, an acclaimed designer of Saturn rocket boosters, with responsibility for the deaths of thousands of slave laborers. He was production director at the V-2 factory. Rather than face a war-crimes trial, he returned to Germany, where he died in 1996.

Certainly, some in Huntsville recognize Dr. von Braun's flaws. "He was a driven opportunist who felt the ends justified the means when it came to advancing rocketry," says Bob Ward, a retired Huntsville newspaper executive whose biography of Dr. von Braun is to be published next spring.

Still, Dr. von Braun is recalled by many here as charismatic, gregarious and brilliant. He knew that his space ambitions were tied to community support, says his former spokesman, Ed Buckbee, 68. Dr. von Braun spoke at countless local functions and was so admired that the city named its civic center after him.

Dr. von Braun remained haunted by his past. Mr. Ward says his research shows that in the 1960s, the rocket scientist privately told colleagues that he spoke out against racial segregation in the U.S. partly because he felt guilty for remaining silent over Hitler's treatment of Jews.

Huntsville has about 250 Jewish families, and most don't focus on the scientists' long-ago histories, says Max Rosenthal, a retired NASA engineer and board member of Etz Chayim Synagogue. "It's something you can't forget, but we had a goal to get to the moon." Richard Lapidus, former president of Temple B'nai Sholom here, tries to put himself in the scientists' shoes: "If I was German and not Jewish, what would I have done during the war?"

Meanwhile, the surviving scientists see one another at colleagues funerals, and continue to monitor NASA. Dr. Stuhlinger predicts human beings won't walk on Mars before 2050, but when they do, "I will see it from upstairs." He plans to spend his remaining earth-bound days in the house he built here in 1953. "I feel privileged to live in Huntsville," he says. "This is my home."

nature

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22 March 1995

A J Dessler
University of Arizona
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Dear Dr Dessler:

Thank you for your letter. I did indeed read the two book reviews you mention but, in spite of your offer, I also read the full text of your letter.

You are of course right to say that strong material like this can seem needlessly polemical and also be offensive to readers. At the same time, I can promise you that our book review editor does not have a hidden agenda and that, for what it is worth, the review by Gehrels had been much modified before publication.

But what you say will remind us all of the problems that arise with controversial books. Thank you for having written.

Yours sincerely,



John Maddox
Editor



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3 April 1995

Dr. John Maddox, Editor
Nature
4 Little Essex St.
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England

Dear Dr. Maddox:

I received your kind letter of 22 March, the same day the latest issue of *Nature* arrived. I read with regret and apprehension the announcement of your forthcoming retirement as Editor. I regret both the retirement and the overly low-key tone of the announcement. I can say with some authority that you have done a marvelous job. I have been editor of three journals of the American Geophysical Union, and I am presently serving on its Publications Committee. While editor, I would measure my results against those of you and Philip Ableson (whom I consider also an outstanding editor) in matters that affected the style and content of your respective journals. On the AGU Publications Committee, I consistently (sometimes a bit to the annoyance of some of my fellow committee members) hold *Nature* up as the "standard candle" of excellence against which we should measure our journals. An editor gives a journal its style, and, to repeat, you have done a marvelous job.

My apprehension arises from the thought that if a very good successor is found, *Nature* will just break even. Good editors are hard to find, and odds favor the appointment of an editor that will not match your standards of performance and judgment.

Thank you, and best wishes for a fulfilling retirement career doing only what you would like to do.

Yours truly,

A. J. Dessler