The War: Walter Riedel and the Agonies of the Secret »Tonne« Project

The shadows of war came closer and closer. Conversations at the increasingly rare evening parties in the lovely Riedel family villa revolved only around politics and economics. Walter Riedel (8) hoped that integration with Germany would bring a turnaround. Yet at the same time annexation by the German Reich meant a great danger for the company. After all, the export situation was going to change in the future. Ultimately, he was facing uncertainty and once again the prospect of uncontrolled economic and political eruptions.

When Hitler finally started the war, Walter Riedel – like so many others – at first did not regard it as a catastrophe. He could not imagine the dimensions Hitler's insanity would take.

Shortly after the beginning of the war, Walter Riedel began making fine, spin-able fiberglass for the production of rope wool. The glass threads were especially needed for technical insulation purposes. Not far from Gablonz, in Thuringian Haselbach, the industrialist Werner Schuller had developed a new method for spinning fiberglass without platinum, which was hard to acquire in wartime. On February 24, 1940, he received patent number 715884 for a »device for the generation of fine, spin-able fiberglass«. This technology optimized the machine speeds and glass fiber quality of existing methods. Officials were made aware of it, and the Ministry of Aviation recognized useful military applications for this material. It set things in motion for a joint venture between Schuller and Riedel. The two entrepreneurs, both used to being the »sole rulers« of their businesses, were not excited about this more or less coerced cooperation, but operatives of the Ministry of Economics locked them up together in a hotel room until they agreed on a contract. Later the men got along even better as they noticed they were made of the same stuff.

Riedel had now learned the true meaning of the word *Mumpitz* (»junk«). In times of war there was no demand for artful glass objects or charming little perfume bottles for women. Survival of the company rested on strategically relevant products. Jewelry, vases and carafes were now only being made in small quantities, making room for more technical applications of glass. The new production line began with lenses and prisms, especially for tanks, and was expanded to protective goggles for the *Wehrmacht*. Where glass blanks were once made for small articles, now badges for the *Winterhilfswerk* (»Winter Relief Organization«) were created. All in all, business was still running fine, thanks to Walter Riedel's continuing ability to develop new sources of revenue.

But Walter Riedel also initiated some things that might not have fitted in well with Berlin policy. The reports from Sabine Riedel's memoirs about the secluded mountain hunting grounds of her father indicate this:

Walter Riedel is »protector« of the fire brigade. Without a uniform, the glass industrialist is distinct in the front row

My father wandered around his property for a long time to find the right place for his hunting lodge. As he conceived it, there should be a nice view, it should be protected from the wind and stand in the sun, and it should have a well nearby. The place he found was away from skiers and hikers, as also required, and had a spectacular view of the Bohemian lowlands. A water dowser came. A spring was found and tapped. Trees were felled, and construction started. A stout hit with a hammer, and the first stone was laid. »Stand firm, our little house« were father's words to dedicate the cornerstone. A box with the building deed and a few Czechoslovakian crowns was walled in beneath it. The house was built to match the landscape. With groundskeeper quarters, a bunkhouse wing for several guests, four bedrooms for the family, a living room, a kitchen and a stall for sheep [...] When the war came, the house became an invaluable hiding place for many people and things.

She does not elaborate on this »hideout«, even later in her story.

Walter Riedel attempted a great balancing act during the war. He wanted to preserve his life's work by all means. The company needed to flourish because it gave him a purpose in life, as it did thousands of other people, especially in the form of a decent job. On the other hand, he disagreed with many of the actions of Hitler and his followers, so he did what he could to help.

The new sales projections for modern fiberglass production put Walter Riedel in a confident mood. However, he still could not be sure if he could keep his company afloat with it. When the Reich Ministry of Aviation asked him if he could produce a 76-centimeter glass screen, he began to think. He knew that up to then no one had been able to and that the supplier at that time could only achieve a maximum of 38 cm. Walter Riedel (8) knew the screens would be used in anti-aircraft sighting devices and that the larger the monitors were, the earlier attacking planes could be spotted.

In fact, no one at that time thought it was possible to produce screens more than 40 cm across. The smaller problem – though it also could not be solved by any company specializing in picture tubes – still seemed to be achieving a quality good enough to produce a completely bubble-free glass of even thickness. The larger problem, however, was the perfect, successive cooling, or annealing, of the glass after its formation. Cooling glass too quickly caused stress – resulting in breaks. The larger the screen, the larger the stress factor. The manufacture of 38-cm screens had already produced a lot of rejects. The technical issue was truly intricate; large lenses today still require long annealing periods.

Riedel took a big leap of faith. Three weeks later, the man who had never shied away from a challenge showed up in Berlin with a stable 76-centimeter tube. To the astonishment of the military leadership it worked outstandingly. Riedel, the glass guru, the technical wizard, the modern alchemist, had a big order under his bet.

Shortly thereafter, he would have to pay for that with ten years of his life. At the end of the war, a trap closed on Walter Riedel, one he had unwittingly built himself with his remarkable technical prowess.

The end came for the company »Jos. Riedel Polaun« in May 1945. On May 8, the Russians marched into Polaun from the north, Czech partisans swept into the town from the south, and the wheels of the Riedel company came to a sudden stop. Walter Riedel received an order from the new Czechoslovak government to continue running the now nationalized company. Indeed, Riedel was one of the first companies to start up business and fire its ovens again. Though Walter Riedel had lost everything, and the entire family fortune was about to be nationalized – its value has been estimated at 100 million reichsmarks –, he would have immediately had an important task in the coming tough postwar period as a renowned leading developer, technician and company director.

But the fact that he was such a clever inventor became his undoing. On August 22, 1945, sixteen days after the US atomic bomb on Hiroshima, Walter Riedel, inventor of the amazing pic-

ture screen, was taken into custody. Apparently he had smelled trouble: The day before, he had tried to flee from the Soviet occupation zone with his wife and a valuable gold coin collection as their only possession. But his wife Claudia was simply not in the physical condition that day for a strenuous march. And so Walter Riedel buried the coin collection in his garden where the Russians later found it.

What exactly happened then became clear only many years later. Four years after Walter Riedel's death, a Rudof A. Müller wrote a letter to Claus Riedel in 1978. A newspaper article had made him aware of the Riedel glass company in Kufstein, having also mentioned the anti-aircraft monitors from that time. He wanted to report a few facts about the story of this screen »that are probably not well known« – and in fact must have remained unknown to Walter Riedel himself.

> The newspaper article only speaks of the large tubes for radar and television. But I would like to inform you about what was really going on [...] Back then it was me who negotiated with Walter Riedel and was the initiator of these programs. I am also a native of your homeland and come from the Jizera Mountains ... In August 1943, I was withdrawn by order of the *Führer* from the battle of the Orel bulge on the eastern front and sent packing to headquarters in Döberitz. There I was told that as a high vacuum technician with manufacturing experience I was being transferred to Fernseh-GmbH-Berlin-Zehlendorf [»Television inc., Berlin-Zehlendorf«] to take over the management of the secret »Tonne« project. At the time, Fernseh-GmbH was the largest research institute in the area of high vacuum and television technology.

Due to bombing in Berlin, Rudolf A. Müller had the research facility moved to Ober-Tannwald (today Horni Tanvald). As head of the secret program – the planning of an extensive ground-based air monitoring system – he decided that he could no longer depend on the Fischer-Ilmenau glassworks, which had been the supplier until then, »because constant aerial bombardment had already reduced delivery to a minimum. Here is where the problem started that would have such terrible consequences for your father later.« Right at that moment came a »highest priority« order form the very top for large anti-aircraft screens measuring 760 by 540 millimeters.

The author of this letter at first tried to resist the order, not just because of delivery problems from the glassworks but also for another reason:

> Because I knew very well that no glassworks in Germany or Austria was able to blow a monitor tube more than 38 cm across because of the incredible pressure after evacuation. It is not yet possible, I thought, we needn't even try.

But Müller was told he had to because aerial defense was heavily dependent on it. He quickly thought of the respected Riedel name, first met with Walter's brother Arno, then was referred to

company boss Walter Riedel himself. Walter said he would have to make a few tests first then confided in Müller that »the order came at the perfect time«. At the moment the company did not have »high priority« for its work, and he was worried his best experts could be requisitioned. Soon after that, Riedel called the head of the secret program and said he would take the order. Rudolf Müller continued:

> Three weeks later the first 25 samples were delivered. Our test results turned out to be excellent. In the meantime, further orders had come from Berlin resulting in a total of 2,000 tubes by the end of the war. And it must be said that these picture tube cylinders measuring 76 x 54 centimeters were the largest that had ever been made in the world by then. Sole credit for that went to your father, Walter Riedel! Up to the end of the war we continued to work on them, and not a single one imploded during evacuation.

The letter from 1978 to Claus Riedel goes on, indicating that Walter Riedel had hoped for a swift end to the war and had been thinking of the future. He called Rudolf Müller once and indicated he would be willing to reduce development costs, if, Müller recalled, »we gave the company Riedel written permission after the war to include the tubes in its regular product catalogue under the name ›television glass‹«. Müller got this demand approved for Riedel, and the Riedel Company seemed to face a truly golden future in the coming television age. But it was not to be.

Eight days before the end of the war four Russian scientists came across the former head of the secret project in the Ober-Tannwald facilities: »We had already retooled everything for peacetime production. Then we were occupied by the Russians.« Müller had already hastily had his secretary »put a big, red X [on the big tubes] so that the Russians would think they were rejects and we could later destroy them to keep the tubes from falling into their hands. At the same time I burned over 2,500 patents and files on patents that were stored with us. But the Russians had apparently gotten wind of something.«

Because Müller spoke some Russian, he got along well with the scientists. With their help he was able to get some people he knew out of the Reichenau concentration camp. When he found out about the imprisonment of Walter Riedel in Reichenau, he immediately pleaded his cause:

> With the help of Major Yarotzky, I was able to obtain a release order for your father. The Czechs were enraged when we came to Reichenau with Russian papers. I had driven there with two Russians and found out that your father was in Albrechtsdorf loading wood with a work crew at the Schowanek Company. We found him there, and he was handed over to us. That is, the Russians drove him home.

These facts had really been unknown until then. So Walter Riedel had been free for a time. Unfortunately, only very briefly. Then came a dramatic twist. Müller:

For the Nazis, the Riedel products are »junk«: Reinhard Heydrich (front group, right), Deputy Reichsprotektor of Bohemia and Moravia, in front of Prague Castle (August 28, 1941)

But when I got back to the facility, the Major said to me, »Your efforts were in vain. Orders from Moscow are that he must be brought to Russia immediately.« I couldn't understand it, since he had practically nothing to do with the really important armaments. We wondered about it for weeks until one day the mystery was solved.
I tried everything to get to Berlin. I wanted to know what had happened in the meantime with the devices we had deposited in a secret depot in Zehlendorf. The Russians didn't need to know this. I told our colonel I wanted to check where the caesium was that we had been keeping safe at »Fernseh«. Actually, I had already had those costly 25 kilos brought to the Black Forest by courier in the last days of the war. [Note: To give a sense of the value of caesium, today a gram of this silvery soft alkali metal fetches US $130.] But the Russians didn't need to know that either. I said it was still in a Berlin cellar. So one day they took me to Berlin to search and find the whereabouts of the caesium. A scientist, who had studied in England and the US for many years and who spoke pretty decent German as well, also came along on this trip. We had a very nice conversation on the way, and at one point I asked why Mr. Riedel had been taken to Russia.

The Russian scientist's answer showed the dimensions of what would cost Walter Riedel ten years of his life. According to Rudolf Müller, the former head of the secret »Tonne« project, the man answered:

»I can tell you. It's very simple. When Berlin was occupied, they came across a flak tower near the zoo with a destroyed Jagdschloss FuG 218 location device attached to a so-called *Sternschreiber* or ›star writer‹. With this device one could locate any airplane taking off in England more than two meters above the ground and follow it with the Sternschreiber. And the bigger the picture tube was, the farther the device reached.
When a Russian group reached the flak tower, the whole location device was wrecked, but the picture tubes on the Sternschreiber were still intact. In addition, the chief officer was a professional electrical technician familiar with this research. We Russians had also been working on a machine like that, but had to give it up because no one could make such big tubes. So when the officer in Berlin saw these tubes, he was really surprised to find such a thing and immediately reported it to the office in Moscow where he had once worked, and that's how it got started.« Müller concluded, »And just a few days later there was a warrant for your father.«

The letter from Rudolf A. Müller moved the Riedel family very much:

One thing you should not forget, especially among experts: Within a couple of weeks,

In the 1930s, practical things are in demand: Part of a liqueur set with hexagonal base

Walter Riedel accomplished a technical achievement, without any fanfare, that the best and most experienced experts in all of Germany rejected as impossible. With picture tubes bigger than 25 cm, there were already complaints, and you could forget everything bigger than 40 cm. But your father managed 76 cm instantly. Things like that got forgotten in the chaos at the end of the war.
In 1956, the Americans were still struggling with tubes of that size. When I had a meeting in Buenos Aires in 1957 with the general director of the Corning Glass Works from New Jersey about altitude-resistant capacitors, his question was, »How did you make those big tubes during the war?«
Myself, I was able to escape deportation by the Russians because I took a big risk and had a little luck. In Bad Reichenhall the Yanks discovered me and wanted to bring me to the US by force, but I wasn't obliging. When the English tried to pressure me, I emigrated with my family to South America for fifteen years [...] Although I am officially out of the workforce, I still have a special place for the material glass in my heart because I am of the opinion that glass still contains many secrets that will continue to baffle scientists for years to come.

The letter to Claus Riedel (9) describes a moment in history from the days after the war in which many things took peculiar paths. German inventors, scientists and technicians lived in great uncertainty. Some were lucky and got recruited by the English or Americans; for Walter Riedel, however, his work ended with deportation for a decade to the Volga and an Eastern Siberian camp.

While Riedel, in no way a war criminal, faced several dark years, two days later the American Department of War announced that all 400,000 German prisoners of war in the US would already be able to return home in early 1946. On December 4, 1945 – the Nuremberg Trials against the Nazi leadership had been on for two weeks – Walter Riedel was transferred from the camp at Reichenau to Russia as a »forced contractor« and forced laborer.

He did not know how long his deportation would last. At first he helped to rebuild Russian glass factories by contributing his knowledge, and later he worked in the laboratory of a glassworks as a developer and consultant. In 1950, when the five-year contract forced on him expired, Riedel finally wanted to return to the West. The Russians had other plans. At first they reacted with mild then stronger pressure and finally with threats to get him to sign an extension.

Riedel remained unfazed, stating clearly that he had fulfilled his obligation with the five years of work in Russia and now had the right to leave. Shortly before his work contract was supposed to have expired, he went to the Austrian embassy in Moscow. There he consulted with the ambassador, filled out formulas and had begun to discuss details of his return.

Apparently, however, the embassy was bugged. Riedel was arrested a few days later and accused of telling the embassy about his work over the last five years, making him a spy. As a result, he

was sentenced to 25 years imprisonment and ultimately spent another five years in Russia, two of them as a forced laborer in Eastern Siberia. Because of the general easing of political tension after Stalin´s death and the great diplomatic efforts and work of German chancellor Konrad Adenauer for the prisoners of war, Walter Riedel was finally allowed to return home in 1955.