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Why?

There is no doubt that Rolf paid dearly for his dealings with Germany during the war. A fine of 5,000 kroner—now equivalent to about 100,000 kroner or 11,500 U.S. dollars—was what stung him least. The loss of income from patent rights was considerably more. Then add the unquantifiable loss and distress of a stay in prison before the law decided that he shouldn't have been imprisoned at all. If you are reported for allegedly having taken part in the building of the enemy's most dangerous weapon and suddenly find yourself facing a fine along with a document stating in black and white that you have *not* done anything important for the enemy's war effort, then the fine begins to appear almost insignificant. Almost an acquittal, as Rolf saw it.

Rolf would live for another fifty years exactly. Significant burdens had to be borne for the next half-century, however rough the road. The people around him would expect explanations: family members, professional connections, research colleagues. It was a delicate matter. There was a whole scale of reactions, from people who feared the worst imaginable to those who refused to see any problem at all. The biggest group, though, was in the middle, all those who either didn't want or didn't dare to enquire, but took it for granted that he must have been a Nazi sympathiser.

When the contents of the legal documents finally came to be known within medical circles in Norway in the 1990s, it came as a shock to some and for others the pieces fell into place. Waloschek's biography a few years before had described some of what had happened, but the book had had a very small distribution in Norway, confined to family members and a small

number of other interested people. Rolf himself sent two copies home, one to his brother Viggo and the other to his sister Else.

One of the theories about why Rolf went to Germany during the war was that he was drawn there by the possibilities available. Many of the people who knew him considered that to be the most likely explanation. He was able to continue his life-long research project. He was able to attract resources to it and the milieu was scientifically stimulating, though he was politically naïve.

Perhaps he had no real choice. Perhaps he understood clearly beforehand that all the other options were worse.

Did an appealing inner voice say 'Opportunity knocks,' or did a more cautious voice emphasise the risk, saying 'Take a chance.' The opportunity appears to have knocked loudly.

But the price was higher than he could have foreseen. Maybe it was worth it; maybe not.

How?

How could Rolf travel backwards and forwards so freely during the war?

Travel was restricted in Norway. Electricity, oil and coal all had to be used sparingly, so that the Germans could use them for their own transport. If travel were unrestricted, somebody would use it to flee by train to Sweden or by boat to England. Rationing affected everything. Coupons were needed to buy milk and sugar, clothes and shoes. If you didn't have any, you had to turn to barter. 'I can get by without paraffin if you can give me your coupons for knitting wool.' Black markets, black-out curtains and ersatz coffee were the order of the day. Air-raid alarms, air-raid shelters, German soldiers in the streets, mass arrests. Can we really trust the neighbour?

That was the situation in occupied Norway, including the family in Røa with three small children. In the midst of all this, Rolf's position as a highly respected researcher in Germany appears anomalous and absurd.

There is only one reason why Rolf could travel as widely as he did. The Germans allowed him to do it. They used him. They needed him. So they looked after him, hoping that he would appreciate his good fortune. I think they feared that he might come under the control of others, that he might turn to the Allies or flirt with the Swiss. If they had threatened him with reprisals, they might have lost his help. Instead, their technique was to offer interesting technological bait that he would turn to willingly, without offending his patriotism more than he would tolerate.

In extraordinary times, people do extraordinary things. We all do. It becomes usual not to say everything, or to say one thing and do something else. These were extraordinary times. There was always something to be hidden. People who were doing illegal work mustn't know whom they were working for or the real names of those involved. Some people didn't even know which underground organisation they had been part of before they fled the country and were in safety. In the home front and intelligence activity, silence was part of the job. It was also part of daily life. People kept quiet not necessarily for fear that what they said might go further, but from an understanding that it was often best for people not to know.

Even simple small talk was dangerous. An 11 year old delivered food to Jews and to refugees and later delivered weapons to a local resistance group. He didn't say anything to anybody. He was just helping an older brother and two uncles who were couriers and who needed a helper who wouldn't arouse suspicion. Nobody talked about it. After the war, the vow of silence was lifted. They still remained silent. They were silent for 15–20 years. The uncles died. The older brother said a little about it shortly before he died, so that the youngest man at least could receive his Resistance Medal for his patriotic acts during the occupation.¹

There are many such stories. Everybody was cautious about everybody else. Two brothers regularly left the house at about the same time each evening. After the war it turned out that each of them had been listening to forbidden radio broadcasts from London without the other knowing.² It was better to be on the safe side. Nobody made an issue of it. That was just how things were. It was war.

When the war was over, it was time to move on. Peacetime. Why talk about the past? Everybody had his own opinions. People had opinions about Rolf, too. They did talk about this. Neighbours and colleagues gave opinions. 'You obviously don't do that sort of thing.' Even members of the scientific community jumped to more or less the same conclusions.

But eventually people laid the questions aside. It was safest that way, for just think about it.

Nazi or Not?

The first thought that people had about anyone who had been in Germany during the war was that he must have been a Nazi—unless of course he was a prisoner. Though what do we mean by prisoner? It is war. When the person in question had moreover been working on something that nobody

understood, something obscure to do with atoms and research and radiation, then surely he *must* have been a Nazi. The label was often applied for much less.

In parallel with his activities in Hamburg, though, Rolf had a family life in Oslo. Few people growing up at that time had their childhoods recorded photographically on 16 mm. film as extensively as his children. We can watch his youngsters in late autumn 1943, playing with a new sledge on the slope outside the house, surrounded by other adults and a swarm of children on toboggans and kick-sleds. We can see him in January 1944 with a good grip on little Rolf who is standing on his first skis, between his father's legs. He is teaching his children to ski, as Norwegian fathers have always done. Arild, who is big enough to use ski poles, is on one side and Unn, who can now manage by herself, is on the other. In the wartime summer of 1944 they are bathing in Bogstad Lake and in the sea, wading and splashing and building sandcastles. Then in autumn he is splitting wood and letting the children help to stack it. Then he goes back to Germany, as always.

Christmases come, first one and then another. Everybody is looking forward to father coming home. Just as in a normal Norwegian family, except that it isn't. How strange it must have been that when father was not there with them playing with Peter Rabbit and the kittens *Nøste* and *Trulte*, in the garden or at the beach or at the cabin, he was in the enemy's country. Working on a top-secret project, employed by the enemy himself. It's scary.

Like every other Norwegian family, the Widerøes were living in a society that divided people into those who were 'one of us' and those who were not. It was in everyday life during the war that the morale and character of the Norwegian people was tested. The historian Guri Hjeltnes has described it thus:

Did he or she choose the right side? Could people keep their mouths shut? Were we trustworthy? Did people resist temptations such as the benefits to be gained from joining the Nazi Party or collaborating with the Germans? Opportunism flourished. Attitudes hardened. Some people never took a clear position. Labels and descriptions of people multiplied. We got patriots, Quislings and traitors, Nazi sympathisers, deserters, German tarts, barracks building barons, profiteers, good Norwegians and bad Norwegians, woodsmen, sympathisers. These terms were a sign of sharp social divisions between individuals and between groups – and of some of the changes that were taking place in Norwegian society during the occupation.³



Rolf and Ragnhild Widerøe in Nussbaumen, October 1992. (*Photo* Pedro Waloschek)

So it was in tune with the times for somebody to ask—or just to wonder—‘What side is Rolf on?’ When everybody was watching everybody else, it would have been strange for people not to ask. But if the answer could be dangerous, it might be safer not to ask the question. These attitudes continued for one or two generations after the war. But which label suited a man such as Rolf? Oh, if only I could have asked him myself. I’m just not sure if he would have answered, though. But I can still formulate the questions. I don’t want to make him either greater or lesser than he was. So, looking at it objectively, what information do we have about him?

Oh yes, his wife Ragnhild, née Christiansen, had a father who was a Nazi. We can document that, but what then? The National Socialists are said to have held meetings in the basement of Rolf’s house in Oslo. That might be true, or it might be a rumour. Rolf did work for the Luftwaffe during the last year and a half of the war. Yes, on a secret radiation project. We have

evidence for that, but do we know why he did it? He was arrested after the war. Got a fine. Do we need to know any more?

Anyway, we can ask the family and others who knew him. Surely they will know where he really stood. Was Rolf a Nazi? A direct question, with direct answers:

Else Widerøe (sister):

No, he was not a Nazi, he was just fully absorbed in his research.

Louise Reksten (wife's sister):

Nazi? No, not at all.

Egil Reksten: (husband of wife's sister Louise):

A Nazi? No, I have a distinct impression that he was not a Nazi.

Did he do anything to defend himself, fight back, squash the rumours that he was a Nazi?

I don't know.

Did he rise above it perhaps?

I don't think it bothered him much.

Wanda Widerøe (Viggo's youngest daughter):

I don't know. It was never an issue when I was growing up.

Turi Widerøe (Viggo's eldest daughter):

I don't know about that, but I do know he worked with them.

Per Trifunovic (grandson and adopted son):

I've not really thought about that. But I could never imagine him as a Nazi. So that wasn't a big issue for me. I only know what I have heard, that he collaborated to help his brother.

Have you met his brother, Viggo?

Yes. We were always in touch with Viggo. They always had a good relationship.

Pedro Waloschek (formerly Head of Information and Professor at DESY, Germany):

He was not a Nazi. He was fascinated by German technology, but not German politics.

Tor Brustad (formerly Professor at the Radium Hospital and at The Norwegian University of Science and Technology in Trondheim):

He was certainly not a Nazi. He was absorbed in his research.

Egil Lillestøl (Professor at Bergen University and a researcher at CERN):

I reckon he was perfectly sound. An idealist.

Finn Aaserud (Director of the Niels Bohr Archive in Copenhagen)

No, he was no Nazi.

Søren Bentzen (Professor at the University of Michigan, USA):

No, he wasn't a Nazi. He was a genuine and ambitious research type, an internationalist and no Nazi.

Olav Aspelund (physicist and holder of a state bursary):

No, he wasn't a Nazi.

Jan Sigurd Vaagen (Professor at Bergen University and Nordic Countries Director in The European Academy):

He was naïve, but he wasn't a Nazi.

So the conclusion is that I haven't met anybody who thought that he supported Hitler. I haven't heard a single person who knew him personally say that he was a Nazi. People have described him as having all sorts of other attitudes and characteristics, but not as a Nazi. However, I have come across people who have scarcely heard of the man but who don't want to approach the problem, in the same way as the CERN research laboratory couldn't find anybody to review Rolf's biography—even though it was written by a determined anti-Nazi with a Jewish background.

Pedro Waloschek told me that he too had thought at first that Rolf must be a Nazi, but that he had quickly changed his mind. Having grown up in Norway in the 1950s, I myself confess that I was concerned lest I might discover that he was a Nazi. One doesn't emerge unaffected from growing up in such times. Good Norwegians didn't flirt with the Germans. Good Norwegians resisted, demonstrated their loyalty.

Enough said. The only strong argument for him having been a Nazi is his stay in Germany during the war. Nothing else that he did or said indicates that he was a Nazi supporter. Neither before, during or after the war.

But why on Earth did he go to Germany? If only we knew *that*.

Nevertheless?

Why didn't he explain himself afterwards? Why didn't he fight back when he was handled unfairly? 'Hallo, I'm the boss. You mustn't say this and that.' Was he embarrassed? Or did he think it wasn't worth talking about it? He had his own opinion and that was enough for him. There can be many reasons for not saying anything. Was he one of those who had vowed to remain silent? Had he been in one of the Home Front's intelligence organisations? The scientific community in Oslo recruited many to XU for example. But

accusations circulated that he had been on the other side. The questions grind round and round. I want to call out:

Did you have something to hide nevertheless? So you were a Nazi too?! A German spy. Or were you on the Allies' side? Or was it not dramatic at all? Just driven by events. Until it was over. Nothing to write home about. You were just naïve. Absorbed in your own research. You were blinkered. A blindfold and your head in the sand. You were stupid, irresponsible. No, no ... thoughtless anyway ... thoughtless at best.

I get entangled in my own virtual dialogue and try to provide the answers too:

Didn't you think about what your children would say?

I thought about them all the time.

You liar, all you thought about was yourself and your research.

They were very young.'

Unn was seven when you left. What do you think she said when her little brothers asked about Dad? They weren't stupid. They had neighbours. Aunts and uncles. I've spoken with your oldest son, Arild. He seemed totally honest with me, didn't try to embellish the facts, and answered my questions helpfully. He gave me permission to quote him. He was only five when you started your long-distance commuting to Hamburg. He was told some things and more to follow, but not everything. And how could he know that what he did hear was the right version? First was the child's version. "Pappa had to go away for a while because there was something he had to do in a town far away." As he grew older, Arild got the official version, the version designed to be safe for public consumption and tolerable to his employers if it reached them on the jungle telegraph. Or was it a case of "I must spare you the truth, my boy," or mother's frightened and frustrated version? What did the boy work out for himself? At his grandparents at Vinderen and Ullern? A little of everything, probably, to build up his own picture which sometimes collided with awkward questions. Such as later when he wanted to join the military. But he is grown up now, over seventy, and he has told me how he sees it. I don't know if it tallies with your version, but here is his – and this conversation has taken place.'

Arild, Oldest Son

I've wondered why your father is so little known in Norway.

Yes, there are many reasons for that. He worked in Hamburg—or, should we say, he *had* to work in Hamburg. I don't know how much you have heard about that.

Yes, I know that he worked in Germany during the war.

He didn't work in Germany of his own free will, but he thought that well, there's no benefit in me being sent to prison too, just because I don't want this job in Germany. But if I take this job in Germany I'll be able to carry on my research. The Germans certainly knew about him. They knew exactly what he was working on, and so they understood what a potential asset he could be to them. I can't remember when it was, whether it was in 1942 or 1943 when the Germans came and gave him the offer, saying "Just listen, either you come to work for us in Germany or you end up in a concentration camp in Germany like your brother." Then my father thought that—yes, he certainly thought about it for quite a long time—and he replied that he thought it was better that he took the job. And so he also was able to help Viggo a little. He could visit him from time to time.

He visited him once, that I know of. Were there other times?

We never really talked much about that. He came back to Norway in 1945.

Then soon after the liberation he was arrested. Somebody lodged an accusation against him, understandably.

He was held in custody in prison for 47 days.

Yes, it was something like that. Wasn't it a whole two months? At that time he had a job in Brown Boveri, and their director advised him to move to Switzerland.'

This was the established story, the short, authorised version of his father's 'Dark Chapter,' as repeated by a loyal, grown-up son who was trying to remember correctly and report correctly. But I wanted to know more:

What do you feel about what your father did during the war?

There hasn't been any talk about that aspect. The only thing I personally heard about it was when I wanted to be a pilot and joined the Norwegian Air Force in summer 1959, because I was a Norwegian citizen. I was asked about various things and when they actually asked me—and I was a little, what shall I say, I was a little ...

... surprised?

Yes, not just surprised, I was shocked, for I had never thought about it—we didn't think about it at that time.

What did they say to you then?

Yes, they wanted to know what I thought about my father's doings during the war and so on. And I, well all I knew was that he had been in Germany then, for we had never spoken about it. And after that I was

told by an uncle, my father's sister Grethe's husband, that the situation had been such and such. But I never spoke about it with Uncle Viggo, for example, even though we were quite close because I always went to him when I wanted advice on anything to do with flying.

Did your father tell you anything about his work in Germany?

No. No. But. I really don't know. I could have asked him, I suppose. For example when I came back from Norway after I had been 'briefed' by my uncle. But I didn't really feel the need to ask him. I didn't think there was anything particularly interesting to know. Perhaps I preferred not to know. Because I knew that Uncle Viggo had had a really hard time.

Overheated

So has Rolf himself either said or written anything that could throw light on the situation? Or will the dark chapter remain obscure? Yes, Rolf has both written and given interviews about this. Soberly and concisely, as always. 'I worked in Germany from then till then.' 'I met this person and that person.' He characterises some people as Nazis, with whom he had to be careful what he said, and others as non-Nazis, with whom he could talk openly. A colleague who was arrested by the Gestapo was half Jewish and "We visited him in the prison and helped him as well as we could.' He could say of a meeting in Berlin that 'The the Gestapo were not there, so we could talk freely.' After being given quite a powerful account of people's emotional reactions he just asserts 'The mood after the war was overheated. Things didn't always go smoothly. I'm not complaining and I don't bear any grudges. But it was good to arrive in Switzerland and start work again.'⁴

An undramatic account, we might say. But shedding light on the situation? No, he just continues in the same way:

Despite everything, the suspicion against me after the war left a slight after-taste in certain circles, and I'm glad that everything now seems to be fully explained. Anyway, the big bouquets of flowers I received from Norwegian embassy people in 1992 in connection with the bestowal of various honours convinced me that nobody in Norway had anything against me.

Yes, that was how he allowed Pedro Waloschek to write it in the biography. Quite simply! Did he believe it himself? A psychologist would call it rationalisation. This is clearly a spruced up version for official use, a Sunday version. He just had to say something, without having to explain too much. A formal statement for people who asked—or didn't ask. For overseas research

colleagues at CERN. For the directors in Siemens and Philips and Brown Boveri. For when he was delivering a lecture in Australia or visiting a cancer hospital in the USA. For journalists, for members of the family and—who knows—perhaps even for himself. The reflections, the understanding of what really happened, the explanations and explaining away, all gradually grew and developed during the exactly fifty subsequent years of a long life, between 1946 and 1996. They matured into a standard version, a shaping of the history that he could live with, an authorised account of his life that he repeated for everybody who wanted to listen, until he came to believe it himself.

Tried to Understand

Nobody can see the world through someone else's eyes, or feel the pinch of someone else's shoes. There are many words of wisdom along these lines. To see something from exactly the same position as somebody else is physically impossible, but it can be fun to try. Such an approach can throw light on the problem and accentuate the shading. A useful way to look at a picture that has long been black and white. One of the people who has made a determined attempt to understand Rolf is the Dane, Søren Bentzen, a true admirer who says right out that he is sceptical about the opinion that Rolf went to Germany to help his brother. Bentzen is an expert on the ethics of research and is a professor at the University of Maryland School of Medicine in the USA. At the presentation ceremony when he was awarded the Widerøe Prize in 2006, he surprised the audience with his acceptance speech:

In his autobiography, Rolf Widerøe maintains that he did it to help his brother, Viggo. (...) This sounds a very understandable and honourable motive – my problem is that I'm not sure I believe him. It obviously must have been a difficult and very emotional decision, but the explanation is simply not very convincing, at any rate for me. It seems like an expedient explanation, a version of the truth that he and others could live with after the war. I think he was driven by his scientific ambition; this was an opportunity to do what he was good at and what he wanted to do. To take the job in Hamburg was the only opportunity he saw. It was “the only show in town.”⁵

Exciting Conflict

While researching for this book I asked Søren Bentzen to expand his view. At that time he had been working abroad for twenty years⁶:

I think he is an exciting person. If Rolf Widerøe had 'just' been a Nazi, we would soon have been finished with him, for there would have been nothing special in the human aspect of his story. But there are good grounds to believe that he was absolutely not pro-Nazi. So as I see his story, Rolf Widerøe is a man who is a victim not of his own political convictions but of his scientific ambition.

How did you become interested in him?

I heard Tor Brustad's lecture about him in the 90s. I'm interested in the history of science, and there was something about this person that caught my interest. The conflict between pursuing one's scientific goal on the one hand, and doing what at the time was considered right and proper on the other. In the biography he mentions being able to help his brother as a motive for taking the job in Hamburg in 1943. The problem is that this sounds like a slightly too easy explanation, an explanation that both he and others could accept. I think that what drove him was scientific interest. Working in Germany was an opportunity to do what he was clever at and wanted to achieve. I think that blinkered him. He said himself that he was politically rather naïve, as indeed he may have been.

But what makes his story relevant for people today is that we have such conflicts all the time. There are numerous examples in connection for example with genetic manipulation and prenatal diagnosis, where we have the same dilemma between research and the ethical or social attitude to what is right. Widerøe made a great contribution to the physics of accelerators, and most of the treatment technology that we see today in radiotherapy is more or less directly based on his inventions. So here we have a very talented man who works hard and pays a personal price for advancing his science. When he had to make a choice during the occupation of Norway, he made the wrong choice from a political point of view.

Bentzen is also interested in why, towards the end of his life, Rolf had a change of career when he became interested in new questions. He wanted to understand the biological action of the radiation.

Does that bring us closer to your own area of study?

Widerøe's contribution in that field was very relevant to what people were working on at that time. It is interesting to take principles and methods from one subject area and see to what extent they can be applied in another area. Just as physics had a golden age before and during the Second World War, now it was the turn of a golden age in biology. Even if one's own background is in physics, it is professionally attractive to try to understand some of the new developments in biology. Widerøe also took part in this. He actually ended up working on biology and on models of how ionising radiation affects cells, and some of his principles still apply. We can say that he was a sort of pioneer of what we call biological field models. But his

contribution would have been even greater if he had published his theories in English language journals. Instead, his articles from that period are mostly published in German, and that tends to restrict his contribution.

A partly shared experience

Does it help us to understand why he decided to move to Switzerland after the war if we take into account the particular mood in Norway at that time?

I think that to some extent I see my own experience mirrored in Widerøe's story. When you leave the land where you grew up, leave your family and leave your friends, there is a price to pay. Widerøe was willing to pay it, but I think he may have under-estimated the political element. Maybe he was politically blinkered. He might have done differently if he had known, but I'm not sure about that. I think that he saw it as an opportunity to work on what interested him. He paid the price professionally with the loss of his reputation. It's difficult to know what really influenced him, but I think I recognise from my own experience some of the pressures working on him. I have come to the conclusion that he was so dominated by his scientific ambition that that was the driving force. He later tried to explain this himself. It is possible that what he did would have been reasonably uncontroversial if it had not been for the particular social climate that the occupation had created in Norway. You do need to take the mood in the country into account in order to understand him. People found it difficult to forgive him, and they found it difficult to distinguish between German nationality and Nazism.

Professor Bentzen categorically dismisses the idea that Rolf might have been a Nazi. He was fascinated by things German, but not by Nazism or by Hitler's Germany:

What is your assessment of his political point of view?

There isn't much to suggest that he was politically attracted by Nazism. But I'm fairly sure that he was attracted by German nationalism and German nationality, and that he was inspired by his stay in Germany. That was obviously influential in his decision to move to Switzerland and spend most of his career within the Germanic cultural zone. Even though he always said that he was proud to be Norwegian, there is no doubt that he liked Germany and German culture. He had studied there and lived there most of his early adult years. He was ahead of his time in this way too. He was an internationalist at a time when nationalism was still very prominent in Europe and had been strengthened by the Second World War. I'm surer that his conscience was clear during and after the war, but because of the attitudes in Norway at that time his decision was perhaps unwise. He

didn't in any way help the Germans to fight the war, but there has been great antagonism to recognising him in Norway. From abroad, on the other hand, people see it differently. The irony that hit him was that he was mainly recognised within the German sphere of influence, while the post-war world was dominated by England and America. Perhaps we could say that if he had stayed on in Norway for another few years and turned down the position in Germany – and then come to the USA immediately after the war – his contribution would have been even greater.

It's paradoxical. Germany was the locomotive of Europe before the war.

Yes, Germany was a leading nation culturally and intellectually before the war, not just in science but also in literature and art. But the German influence diminished after the war and many people left.

Bentzen though that like Werner Heisenberg, Rolf faced the problem of how to explain himself. For Heisenberg it was a question of explaining why he didn't leave Germany in the 30s. He was working in Göttingen with many of the other leading physicists of the day when the law was made that people with Jewish ancestry could not work in the service of the state and many people left Germany. Nearly all his colleagues in Göttingen either were Jewish themselves or resigned from the university in sympathy with their Jewish colleagues. Heisenberg was one of the few important physicists who chose to remain in Germany.

Heisenberg probably wasn't a Nazi either, as I see it; he was a German nationalist who saw it as his duty, and perhaps his fate, to stay in Germany. We can see from his autobiography how he seems to wander round the topic. He obviously had a problem explaining himself.

Bentzen refers to a play he had seen in London:

When I lived in London I saw Michael Frayn's play about Heisenberg. It tells the story of Heisenberg travelling to Copenhagen during the German occupation of Denmark, to visit his old friend and mentor, Niels Bohr. They had a close relationship, they had gone on holidays together and Heisenberg knew Bohr's close family. There is a famous description of them going for an evening walk during the war-time visit. Bohr came from a Jewish family, and he obviously found it very disturbing to welcome a scientist from Germany when Denmark was occupied. We don't know exactly what they talked about during the visit, but we do know that when they parted again they were no longer friends and they never again would be. A *Guardian* journalist, Michael Frayn, wrote the play *Copenhagen* which was seen in many places throughout the world and has also been made into a book and a TV programme. He presents three different scenarios of what might have happened during the meeting. An interesting play, even for non-physicists.

The dramatization of the fateful meeting between these two has also been performed at the National Theatre in Oslo, with the famous actors Svein

Tindberg as Heisenberg and Sverre Anker Ousdal as Bohr. It starts with the words ‘Now we are all dead ...’ Only then could one speak about it. One of the people who saw the play was the physicist, former Industry Minister and head of the Defence Research Institute, Finn Lied. He discussed it in an article, where he particularly describes the episode where Heisenberg had received an invitation to dinner with Bohr and had reacted with hesitation:

Before, when Heisenberg had been a research student with Bohr, they had often gone for a walk. Now, they went for a walk partly to avoid being overheard. What happened? What did the two physicist-philosophers talk about? The meeting is said to have been very difficult and to have ended in a psychological catastrophe with Bohr very angry. It is no surprise that this material has now been given a dramatic interpretation.⁷

Finn Lied described the performance as presenting ‘a rather dreamy and philosophical Bohr’ and ‘the younger and more precise Heisenberg.’ There are only three *dramatis personae*, namely the two physicists and Bohr’s wife Margrethe who ‘is doubtful about Heisenberg and is the commentator within the plot.’ The play was performed first at The Royal National Theatre in London and later in Copenhagen and Stockholm. Lied asserted that it offered the public an extraordinary cultural experience:

The whole spectrum of problems surrounding nuclear fission is explored in the conversations: the effect of fast and slow neutrons; the problems surrounding the manufacture of U²³⁵ and plutonium; the difference between a reactor and a bomb, etc. (...) And the whole play is set in occupied Denmark with Heisenberg representing the occupying power. We can safely say that it is an unusual drama. The audience can decide from themselves whether Frayn has solved the riddle of Heisenberg’s visit. I am still in doubt!

Finn Lied abstains from firm conclusions. In the play itself, the main characters also express themselves in uncertain terms: ‘If people are to be measured only according to what can be measured ...,’ says Bohr, and Heisenberg finishes the sentence for him: ‘... then we need a whole new quantum-ethic.’

‘The Mad Scientist’

Søren Bentzen says that he doesn’t think Rolf worried very much about what other people thought and felt about what he did, but he does think that it must have been a personal dilemma.

He must have known that at that time it would be difficult to defend his decision to go to Germany. Yet he did go. There are parallels with researchers today who work with technology that could be misused. The urge to explore deeper and deeper into an area of research can create a fundamental conflict. This arises in discussions about stem-cell research, whether or not the researchers should try to clone a human being. There is a sense of “the mad scientist” who will follow a line of research as far as it leads, whatever the price.

I think I understand Widerøe somehow or other. If he had been a Nazi, what he had done would have been equally striking, but I think there would not have been the same fascination with the man himself. What makes him interesting to me is that he did what he did despite the political situation. If he had been pro-Nazi he would just have been doing what he thought was right according to his ideology, and that would have been the end of the dilemma. I think that he himself felt a sort of ethical conflict and that after the war he needed to justify himself. So he produces these more or less convenient explanations about his brother. That is when it starts to become interesting, because he has really been working towards his scientific objective not because of Nazism, but despite it.

Does that make him more human in your eyes?

Yes, absolutely. He was also confident and charismatic. I've seen a picture of him delivering a lecture at The American Institute of Physics. You can see from his body-language that he was a formidable character.

But what sort of a person was he? Did you get an idea of his personality?

There are glimpses that begin to give us clues what sort of a person he was. I think he really lived and breathed for his research. In his biography, he tells us how he continued his work on accelerator physics while he was in prison, how he was almost using his imprisonment to lock the world out. He said “It was hard for my wife, because we didn't have much money,” and things like that. “But I was fine because I could sit there in prison working on the things that interested me and make progress in this and that.” He had quite a different agenda, and the conflict involved in his choice here is what makes him interesting to people today. The fact that he chose as he did is what makes those who are interested in him try to understand his real motivation. The moment when he was offered the post in Germany characterises him as a person. He could have chosen to stay in Norway and said “No, thank you. In present circumstances I don't want to take a job in Hamburg.” At that time nearly everybody realised that Germany would lose the war, and if he had been more politically astute he could have sat on his hands and said “No, no. Be patient, friends. I'll wait till after the war.” The choice that he made was more interesting because he was not a Nazi. If he had been a Nazi he would just have followed his instincts.

You're referring to the public conflict again?

That's the heart of the matter: what one *should* do, as compared with whatever benefits one might gain from doing something else instead. I'm sure that many people at the time considered him a Nazi, but I think that to give him that label is a logical short-circuit. They labelled him as a Nazi because he took the job in Germany. It then becomes a circular logic: "He took the job in Germany because he was a Nazi." I think that as the years passed the story involving his brother was brought in as a convenient explanation. That is something we can all identify with, but he tells the story in a basically unemotional form, almost as a marginal comment, that that was the deciding factor for him. If he had really had qualms of conscience about accepting the offer of the job in Hamburg, he would have devoted more time to explaining himself and describing how he had faced a personal conflict.

If we take a cynical point of view, can we ask who was trying to use whom?

That's an interesting question, whether he was using his brother or genuinely trying to help him.

Theoretically, Viggo could also have used him to obtain benefits for himself and thought that Rolf was a traitor.

Whatever the case, the story about his brother was a simple, practical explanation. But as in Frayn's play, we shall never know the truth of the matter. We can't necessarily even trust those who were right in the middle of events, for each of them needs to find his own version of the truth that he can live with. This applies to both Viggo and Rolf. As with Bohr and Heisenberg, we know both of their versions of the story but neither of the two versions appears fully accurate. I think they have both subsequently re-written the story a little.

But as we are now speculating, what would the consequences have been if he had been a Nazi?

In Scandinavia we have the discussion about Hamsun, for example. Thorkild Hansen's book "The case against Hamsun" in the 1970s. I think that is an illuminating attempt to understand Hamsun and his motivation.

Hamsun received a Nobel Prize and is recognised as a great author. Nevertheless the Norwegian people struggle to accept him. Such things are obviously not simple.

No, and there was an attempt to declare Hamsun insane. In England there was what was called "Social Darwinism," an attempt to rationalise a sort of super-race theory where one obviously thought that the English were on the highest imaginable level of development. Nazism was also in many ways a romantic and an anti-modern movement. It was an attempt to turn back to nature and the original values and so on. Much of this appealed to people at the time even if they were not necessarily in agreement with the persecution of the Jews and the extermination camps. That is where

Thorkild Hansen does a wonderful job in making it seem more understandable how a person like Hamsun could have a certain sympathy for some of these ideas. Obviously people didn't see it like that during the war.

No, and it is a more tabloid point of view.

But it was difficult. In Denmark we had the Gymnastics Movement, and many of the leaders there flirted with Nazism and were invited to some of the big assemblies in Germany. After the war it became taboo. It was associated with all the dark aspects of Nazism, and the idea of "a healthy body and a healthy mind" became almost illegal. Much of this has acquired an odious sound because of the link with Nazism. Like Wagner's operas. But one can still listen to Wagner. I have a friend in the USA who will not drive Japanese cars, because of the Second World War. But doesn't it have to stop somewhere or other?

At the Right Time

Professor Bentzen thinks that Rolf's contribution to science was significant. In answer to the question whether he was ahead of his time in that his ideas outstripped the available technology, he answers as follows:

No, he wasn't ahead of his time. He was exactly on time. He was the right man at the right time, but not necessarily always in the right place. Some of the opposition to him was professional opposition; people just doubted whether his theories would work. Even in modern times I have heard people say it was really amazing that they worked. But Rolf Widerøe was persistent. He eventually found a university that would allow him to work with his ideas, and he persevered with them. His difficulties started with the choice he made during the war. And it was that rather than any professional considerations that damaged his reputation. From a purely professional point of view he had the right ideas, at a time when they were within the scope of the available technology.

Even though it was several years before the Americans took up his ideas, you suggest that it didn't take an unusually long time before they were put into practical use.

In the history of science there are other examples of somebody having an idea that was never followed up, because it was beyond what was practically feasible. In a historical perspective, there wasn't really a long time between Widerøe's ground-breaking ideas and their application to the treatment of patients with cancer. In this sense, Widerøe's story is almost a model of how science often progresses. Here we have a talented youngster who sets himself up against the authorities in the field but is later seen to have

really understood something. Modern radiotherapy couldn't exist without Widerøe's ideas.

The Scene Is Set

Søren Bentzen wonders why Rolf's personal fate continues to engage people. He thinks it is because of the conflict of interest, with patriotism and politics on one side of the balance and science on the other.

In this case, Widerøe the scientist chose to come down on the side of science.

I think there is something noble about that.

But aren't there many people throughout history who have done that?

The Widerøe case is so extreme because he wasn't German and he wasn't a Nazi, yet he still decided to go to Germany. At a time when one could say that sound common sense and political awareness – and perhaps even professional opportunism – would have argued against going. These considerations would have favoured lying low and waiting in Oslo for the Germans to lose the war. I think that the offer made to him was very tempting. It was the opportunity to build his machine.

He understood that there was a very particular mood in Norway after the war. How significant is that?

There was a particular mood that we must take into account when we try to understand the rough treatment he experienced. There was also the commercial and industrial influence, which was not really welcomed by physicists at that time. That is controversial too. I think that especially in the European academic tradition people saw it as almost improper to try to commercialise and earn money from one's scientific ideas. In addition, around the time of the Second World War the professional milieu was much more elitist and self-centred than the same milieu would be in our day. So he was probably treated badly both because of the unique circumstances following the German occupation of Norway and because of intolerance among fellow-scientists.

So do you think that a younger generation of physicists will see things differently? That it will be easier for them to acknowledge his contribution when they are clear about it?

I really do believe that, because physics has changed too. Not many people nowadays believe that physics is truth with a capital T, that to study physics is to read The Word of God or Nature's Great Book. The postmodern way of thinking about it is more that every physical theory has a restricted area of application and that we can always uncover new layers. It's a more open way to think about physics, that systems are useful in so far as they are able to provide the right answer in one context or another.

And I think that physics is really much less orthodox than many other sciences. The physicists in those days may have been more purist and therefore more judgemental when it came to seeing Widerøe's contribution in perspective. I think it is true to say that a modern physicist will find it easier to recognise a contribution that is more in the category of applied physics. We need to declare that Widerøe did a very important piece of work in physics. We can see the pure physics at the heart of it, but we can also say that it is practical, applied physics because the machines he built can be used to treat cancer.

Bentzen says we cannot ignore the fact that Rolf was controversial both in his day and since.

When Tor Brustad had the idea of restoring his reputation in Norway, even fairly close colleagues were strongly opposed to the plan. Nevertheless, Rolf's history continues to fascinate not only scientists but all of us, because inwardly we can see ourselves in his shoes. What has fascinated me is the choice that Rolf faced, rather than trying to understand him in detail. The scene is set, we might say. An extreme decision has to be made, in a hostile setting that sharpens the choice. The drama is intensified as in an opera or a play.

Maybe this could provide good material for a play like the one about Bohr and Heisenberg?

Yes, indeed. Just as Michael Frayn did with the meeting between these two in Copenhagen, one can imagine a scenography of what drove Widerøe. It is a drama of conflicts that humanity has faced for millennia.

Voluntarily or 'voluntarily'

Søren Bentzen's starting point is that Rolf had a dilemma, a real choice, and chose to go. His brother's situation was a substitute justification. Tor Brustad at the Norwegian Radium Hospital was also fascinated by the dilemma, but for him the voluntary choice was more a euphemism for 'voluntary compulsion.' Rolf *had to* go. The question was what he could negotiate in return, how he could use the situation to his advantage. Professor Brustad put it thus:

Rolf Widerøe understood clearly how problematic it was in 1943 to take a job in Germany when all links between Norwegians and Germans were looked at askance. But his brother was sitting in a concentration camp, with his health deteriorating. On the other hand, there were strong reasons not to go, as Norwegian opinion would not understand collaboration with the Germans. So this was another part of his dilemma.⁸

Thinking aloud about how Rolf might have reasoned, he formulated it thus and thereby demonstrated his goodwill towards him:

He knew that developing such a betatron with this energy level could not enhance the war effort. Time has proved him right. On the other hand, general opinion was strongly opposed and the question was how his move would be understood. 1943 was a catastrophic year for the German war machine. They had capitulated at Stalingrad on 2nd February and when the German officers came to Oslo to talk to Rolf later that year Hitler was in retreat on all fronts, including Africa and Italy. In England, the Allies were building up the world's biggest store of munitions in preparation for an invasion of Europe and a death-blow to Germany. He knew all this when he met the German officers. Germany was beyond rescue. There was no longer any doubt who would emerge with the victory; it was just a question of time.

Rolf realised that there would hardly be enough time to develop a betatron. They would be lucky to achieve it. The work could have no effect on the outcome of the war, but with contacts in neutral Switzerland he could later develop a betatron for cancer treatment and the testing of metal welds, of which ruined Europe would have great need. Nevertheless there were such strong arguments against going that he must have considered that he couldn't let himself into this situation and the answer would have to be 'No.' But then he wanted to help his brother. Going to Germany could give him an opportunity to do this. So he took up with the German delegation the question of whether by agreeing to their research project he could reckon on receiving support from them for an application for clemency for his brother.

Such were Professor Brustad's reflections.

As Waloschek Saw It

The third person who took up the story of Rolf's life was Pedro Waloschek, the German physicist who wrote Rolf's biography. Pedro passed on Rolf's version of the reason for the decision and more or less satisfied himself with that. From his conversations with me, he originally believed Rolf's explanation that the prospect of helping his brother was decisive, although at the same time he clearly saw the Germans' technological interests in having him in Germany. In the foreword to the biography, where Waloschek is speaking with his own voice, he presents Rolf's stay in Germany during the war simply and unequivocally:

In the hope of being able to help his brother out of prison in Germany, Rolf Widerøe agreed in 1943 to go to Hamburg to build his youthful dream, a 'radiation transformer' or 'betatron' that could produce very strong X-rays. His brother Viggo was one of the pioneers of aviation in Norway and had taken part in the Resistance. Some experts in the German Air Force believed at that time that one could use X-rays to shoot down planes. But Widerøe didn't believe this, and serious physicists also considered it impossible.⁹

But after Waloschek had finished writing the book, he started on a project about arms research in general during the war. During this he came across Rolf's betatron again, and he now suggests explanations other than Viggo's plight as the reason for Rolf's decision:

His Norwegian employer NEBB was in agreement with the decision, or must have been involved in it. But judging from what happened later, NEBB and the Swiss parent company BBC were also interested in building this type of accelerator themselves. We can also assume that while Widerøe was in Oslo working on ideas for his two radiation transformers in 1942 and 1943 he had support from NEBB, as this must surely have taken up a lot of his time. (...) Obviously the German authorities at that time had no objections to his continuing good relationships with NEBB and BBC.¹⁰

In a later conversation I had with Waloschek, he said right out that he had come to the conclusion that the brother could not be the only reason for Rolf going to Germany during the war.¹¹

As the Family Saw It

The family has never made any public comment on Rolf's stay in Germany during the war, but in conversation with me during the preparation of this book his sister Else summarised the situation:

- We said 'Don't you realise that it will be seen in a bad light?' But Rolf wasn't interested in politics, he was absorbed in his life's work. There was no use in talking with him. And you can't talk *down* to a grown man.¹²

What did he say himself about why he went? I have listened repeatedly to the tape-recording of the interview with the physicists in Oslo when he was over 80. I've read the transcript from that time and his own later translation of it into German. Tried to find out what he said, both on and between the lines. In the interview he was asked directly how the project in Germany came into being. He referred then to the fact that he had tried to find out

more before he moved and had said that ‘I obviously can’t do this without further discussion. I’ll need to hear a little more about it all.’ They had replied to him, ‘We can talk about that in Berlin.’ He said that they had then mentioned his brother:

They also implied that it could make a big difference for my brother. My brother, Viggo Widerøe, was the Director of Widerøe Airlines, which was dormant, naturally, but had helped several chaps travel from Norway to England and that had naturally been discovered and he was arrested and condemned to ten years corrective detention in Germany, severe detention. And then they implied the possibility that he could be set free. So then I went down to Berlin, and we talked a lot about it there. They had thought of building a small betatron in Hamburg, and they said that if I went along with that and helped them there, they would set him free. So they would do what they could to have him set free. Then I said yes, I’ll do it. I didn’t know anything then about all the business with Schiebold and that there was the anti-aircraft weapon and all that behind it, I didn’t know anything about that because it was all so strictly secret, I wasn’t allowed to hear anything about that.

‘Transported There’

In a whole page featured interview in a Saturday issue of *Aftenposten*, Rolf uses the phrase ‘transported there by the Germans’ when talking about his stay in Germany during the war. This was the only comprehensive interview with Rolf that ever appeared in a Norwegian newspaper. Rolf was 69 then, and the interviewer was an experienced journalist who in the course of his career interviewed major figures such as Sartre, Adenauer and Golda Meir. He had been the foreign correspondent connected to The International Press Institute in Zurich when the betatron was being installed in the Radium Hospital in Oslo.

This obviously tells us a lot about the media, who at that time were considerably less critical and less probing than they are today, but it also says something about how totally unknown Rolf must have been in Norway when a heavyweight press reporter can let him off so lightly when he talks about his time in Germany, without suggesting that there might be other points of view:

- The first betatron to be built here in Europe was the one I built in Hamburg during the war. I was transported there by the Germans to build such a machine for them.¹³
- *Was it of military importance?*

- Absolutely not! It was a pure experiment. They thought that something might come out of it for medical use, or in other fields. That worked out, but the machine in Hamburg was too small for subsequent needs.

Earlier in the same interview Rolf had said two other things about his time in Germany:

that in 1943 he had taken out a German patent on ‘collision between high-energy particles’—his pride;

and that the patent ‘proposed collecting protons in two rings where they move in opposite directions and using special arrangements to steer them onto colliding paths.’

He adds:

‘So the idea is originally Norwegian.’

That is literally all that is said about the war years in the featured interview. As a journalist one generation later, I am burning to ask follow-up questions. The interviewee must surely have more to say about this. Why did the Germans want him to work for them? And why was he willing to do it? Whether I would have got any reply is another question.

Interpreting the Biography

Rolf himself translated the transcript of the interview with the physicists from Norwegian into German. Pedro Waloschek used Rolf’s translation as the basis for this section of the biography, which was read through and approved by Rolf:

Whatever the Luftwaffe had thought to do with the betatron, they didn’t tell me. I only got to know about that later. At any rate, I didn’t know then – nor did I have any idea that the betatron could or would be put into use as a weapon. Nor did I think that it was technically possible. There must have been a strong motivation to regain the lead the Americans had in this field – in other words what betatrons could later be used for.

Officially it was always about the development of unique, high-quality X-ray equipment for use in medicine and non-destructive material testing. In connection with the betatron it was about small, relatively convenient apparatus to take the place of normal high-tension installations.

So I agreed to go to Hamburg later or to be more precise, with my own more or less voluntary consent (and obviously with consent from NEBB), I was set to compulsory work.¹⁴

In a video recording Waloschek made with him in autumn 1992, Rolf repeats more or less the same account, with a few minor additions including an introductory comment that we must remember that the situation in Norway in spring 1945 was not normal. People were hunting for traitors. This interview is mainly variations on the same theme, and repetition doesn't make us any wiser. But this is also connected to the fact that the text has been translated back and forwards and that the written sources are partly based on the transcript of a tape-recording.¹⁵

The interview with the physicists in Oslo was in Norwegian. The transcript was then translated into German and quoted in Waloschek's book, which was later translated into English and Russian. In the biography Rolf uses the phrase that we have quoted above as 'my own more or less voluntary consent.' This concept is open to various translations and interpretations of the nature and degree of 'voluntary consent.'

Freely and voluntarily? What does that mean when the enemy is asking the question? And anyway, what is the alternative? Was there really any choice? It is war.

Perhaps Rolf's conclusion about this was just as uncertain as mine. Perhaps it was his best understanding forty or fifty years after the event. But to admit that he had been in doubt whether to go or not would have been conciliatory towards his critics. Tor Brustad thinks that he was in doubt. If he was not, that in itself would be enough to provoke people to judge him with moral indignation.

Bitter?

I approach the question of freedom of choice from another angle and try to find out whether Rolf felt bitter about what had happened. The answer will be interesting from a human aspect but will also throw light on the reasons for going to Hamburg. In the absence of answers from himself, his family are the most likely to know. First, someone from his wife's family:

*Jørgen Holmboe (son of his wife's sister Anna Margarete, interviewed in 2006):
Did you have the impression that he was bitter about his arrest and the fine and
the way he was treated after the war?*

I don't know anything about that. It was never a topic of conversation and this is all so new to me; I never knew anything about it before. But I now know – I've spoken with my parents more recently – and I have heard that it could be a rather, shall we say, difficult family relationship about this, not in the Widerøe family but in my mother's family, where people had slightly different judgements and slightly different experiences in connection with the war. Another uncle, Egil Reksten, who was married to Ragnhild's sister Louise, was a prisoner in Germany. There was certainly something or other there, but it was never a topic. But my father said relatively recently that there could be some very difficult Sunday lunches at Ragnhild's parents' house right after the war.

What about the lack of professional respect in Norway. Did that upset Rolf?

I really wouldn't have noticed that. No, I think he joked about that, with all his honorary doctorates from various medical faculties. I once heard him say 'Now I've received all the possible prizes except the Nobel Prize, and it's too late for that.' And that was probably when he was 75 or 80. The fact that he was with Brown Boveri, an industrial firm, whether that had anything to do with it, well – it is the case that research carried out in industry is not always accepted with equal status in academic circles. I don't know how much we should read into that, but the fact that research also happens in industry is much more widely recognised abroad.

Do you mean by that, that it was the professional environment and resources that lured him to Hamburg in 1943?

Yes, the most likely explanation may well be that since that was where the resources and the milieu were – and being the slightly blinkered scientist that he was – so he decided to go. But that is guesswork on my part. It's not entirely unusual to be in a research environment that is financed by industry and at the same time has academic connections, but it is more usual in countries other than Norway.

Is it problematic for Norwegians to give an engineer with commercial connections academic status? That they take out patents instead of publishing academic papers?

Yes, in a way. But the possibilities of making progress may be better if you have strong industrial backing. So it can work both ways.

Rolf Widerøe jnr. (youngest son, five years old when they moved to Switzerland):

Could you in the family see whether your father was sad that he couldn't stay in Norway?

No, we didn't notice any signs of that. We knew that Father had worked in Germany for a year or two during the war. There were people in Switzerland who said that he had worked on the development of the V2 rockets. But it isn't the case that I then went straight to Father and asked

him if that was true. I didn't go into that. I thought that if there was something of the sort, my parents would sooner or later get round to telling me about it. But he did once hear that within the family his mother was referred to as "poor soul."

Then he goes on to talk about the professor at the Radium Hospital who went through the case documents from that time and rehabilitated his father's reputation with an article and a meeting at Hardanger.

We were all there, Mother, Per, Arild and myself. I got to hear what had happened. In addition there was Waloschek's book, published a few years earlier, that had also told us a little. As regards what you asked about, whether father regretted not being able to work in Norway, we didn't get that impression at all. We always went on holiday to Norway. He said once or twice that when he retired he would return to Norway to die. That was the only sign we saw that he longed for Norway, when he was able to say that. How seriously he meant it, well, but he was rather – with all the business during the war and all that – he was rather more concerned that he basically in a way was forced to move out of Norway. I think he felt that a little more than Mother. That's what I think.

That they had to leave the country because of public opinion after the war?

Yes, I do think so. But it's not as if he was really bothered by it. Not at all, for he was really – for the most part – very positive and happy, and satisfied with everything as it was. But it isn't the same thing whether one moves willingly or not, you understand.

How willingly do you think it was?

Hm...

Really? Do you think that he went to Germany willingly?

That's possible, for when he had the idea of the betatron and this task he had set himself, fifteen or twenty years before, and now he sees that the possibility was there to carry it out... And he knew that there were others who would be trying themselves. In England and the USA there were people who had also started developing this sort of apparatus. I think that may be possible.

It fits the picture you have of your father, that he could be so absorbed?

Yes. Yes, perhaps that, yes. He was never really interested in politics. And going to China to deliver a lecture during the Cultural Revolution, that was no problem for him. On the contrary, he thought that what they were doing in China was really fine. He was uncritical in that way.

And then Rolf jnr. pauses to think a little before he continues. Reminds himself of the question:

Whether Father went willingly or not, that is difficult to say. I really can't think anything definite about that. But you should speak with Per, who

lived with my parents from when he was 7 until he was 24, and with my brother Arild, he may have a slightly different impression.

So I still haven't had any unambiguous answer to take me forward in my search. I don't think that is just because the people I ask are being diplomatic. I think they genuinely don't know. They respectfully refrain from expressing confident opinions when they are unsure. Each person who replies reminds me to ask somebody else. They refuse to claim a monopoly on the truth.

Then I go to somebody with a prison number tattooed on his arm, a man who has married into the family. Maybe he will have a sharper point of view.

Egil Reksten (married to Rolf's wife's sister Louise):

I've been wondering why your brother-in-law went to Germany in the midst of the war. Why do you think he did it?

I think he didn't really think it through. He was so buried in his own thoughts that he didn't think there would be anything wrong. That was where he had the chance to make progress with his project, anyway that's how I have understood the situation. It fits with how I saw him afterwards too. He was so obsessed by thinking about technical and scientific matters that he just had to follow them through. I'm convinced he was so deeply immersed in his own ideas and work that he didn't have space in his brain for other things.

If you had had a brilliant idea, what would you have done? Would you have followed up your idea in Germany if you got the chance or would you have followed the flow, postponed the research until later and been a good Norwegian?

Yes, what would I have done in such circumstances? I would have gone to England and developed it from there. But I don't have the basis to assess how a researcher such as Rolf would see it.

But is it conceivable that Rolf could have moved to England? Was it a practical possibility? Moreover, he had spent several years studying and working in Germany; that's where his contacts were.

Yes, I wouldn't exclude the possibility. If he had really wanted to he could well have gone to England. Some people travelled round the whole World to get there. But I don't think that really occurred to him.

Name and Shame

Some people didn't ask openly why Rolf worked for the Germans, but nevertheless had opinions about it and spoke about it among themselves. To them, Widerøe's name became shameful. 'Remember what he did!' End

of discussion. Many of the Oslo University physicists in the Norwegian Academy of Science and Letters were opposed to Rolf being given any honours. One person who has observed this is his nephew, Aasmund Berner, formerly Professor of Pathology. When I interviewed Professor Berner in his office at the Radium Hospital, he had a copy of his uncle's biography on the desk and his doctoral thesis on the bookshelf. He told me about the reaction when his colleague Tor Brustad suggested as part of a lecture that Widerøe should be given some honorary recognition:

Aasmund Berner (son of Rolf's sister Grethe):

Uncle Rolf was still alive at that time, but he was ill and was not expected to live very long. Brustad wanted to arrange some sort of recognition while he was still alive, but it didn't come to anything. Remember that nobody understood very much about Rolf's research. That was one thing. The other thing is that the research environment in Norway at the time of Rolf's imprisonment wasn't ready for his ideas. They hadn't reached that level. The professors in the expert committee during the legal case labelled them as just nonsense; he wasn't a real researcher.

How could they say that?

I don't know them, so this will just be speculation. But we can think that – well, people in prominent positions often have self-important traits. And if you think that you know best and then somebody comes in from outside, and especially somebody who is thought to have acted suspiciously, then ... For example, there was a bust of Uncle Rolf sculpted for the Radium Hospital and when the Physics Department at the university was asked if they wanted a copy they said 'No, thank you.' I know this only at second hand, I know a little at first hand. But it is striking – even though we have a small presentation about radiation in the foyer here at the Radium Hospital - it is striking that when I mention Rolf's contribution it seems to me to be undervalued. I've tried to say something to the management, both past and present, but I feel I'm talking to deaf ears. Professor Brustad is an exception. He has done a lot for Rolf's reputation.¹⁶

The lecture that Professor Berner referred to was organised by the Norwegian Academy of Science and Letters, of which Brustad was a member. The meeting was arranged in connection with the anniversary of the discovery of X-rays, on the theme of researchers who had made advances in this field.¹⁷ Brustad said that he thought Widerøe had been overlooked, and he proposed that a committee be set up to consider whether the Academy should take the initiative to honour him in an appropriate way. He based his proposal both with a view to the Academy's own reputation and on 'what we as its members owe to this pioneering scientist.' According to Brustad

himself, he contacted the leadership of the Academy several times both verbally and in writing to remind them of his proposal. Eventually he was informed that it would be sent to senior academic members to be dealt with, one of whom confirmed to him that his proposal had been rejected. Rolf died three or four months later.

‘The proposal came to nothing, and I’m not surprised if the reason was that powerful men were opposed to commemorating him,’ Brustad commented.

Membership or not

There had been similar controversy 25 years before, about whether Rolf could become a member of the Academy. Powerful forces were opposed to him. Other members said yes, that it was high time and that it was a shame he had been neglected for so long. Then as now, The Norwegian Academy of Science and Letters was a venerable institution for leading scientists, not a club that just anybody could join. One was invited. Although the constitution of the 150 year old academy has been adapted over the years, it still states that ‘Admission of Norwegian and foreign members happens after an evaluation of the significance the proposed candidate’s scientific contribution has had in the relevant subject area.’ The fact that Rolf was ageing didn’t make the proceedings any less dramatic. It also says in the constitution that ‘New members shall normally not be older than 65 years. Specified reasons are required when the nominee is older than 65 years.’

Tor Brustad said that finally in 1973 the time was ripe for Rolf Widerøe to be voted into membership of the Scientific Academy. It was then seven years since the death of the powerful chairman of the expert committee in connection with the legal case.¹⁸ As a newly appointed member Rolf delivered a lecture in the mathematical-scientific section entitled ‘Radiobiology and Radiotherapy,’ his new subject area. It was an important victory for him and for those who had argued his case, but it didn’t really change very much either in scientific circles or beyond. He delivered a variant of the same lecture at The Radium Hospital. This was printed as an article in *Fra Fysikkens Verden* (‘From the World of Physics’)¹⁹ with a whole series of scientific degrees and honorary titles piled beside his name—‘Dr. Ing.; Dr. Ing. e.h.; Dr. med. h.c. R.’—and with the additional information that ‘Widerøe is Professor Emeritus at E.T.H. Zürich.’ Whether this was him now getting his own back or whether it was the editor who had wanted it thus, the message was clearly that he was an academic and not an engineer from industry.

Professor Berner said that as there was no doubt about Rolf's contribution to science it was amazing that he hadn't also been recognised at home in Norway. He wondered how much politics was behind that.

Looking at it in isolation, it's difficult to understand that we can't recognise somebody who continues his professional work even during a war.

Yes, I don't know what it is.

Really?

No, I don't understand it at all.

We need to be able to disperse the fog of war and see more clearly. Is that what you mean?

Many weren't up to that. They were so obsessed by past events. I think many people are wrongly condemned. Even today, people still have strong feelings about the war.²⁰

Viggo was the Hero

The public mood in Norway after the war honoured Viggo as strongly as it rejected Rolf. Viggo had distinguished himself as a resistance fighter and had acquired heroic status. Gunnar 'Kjakan' Sønsteby, the highest decorated of Norway's resistance workers, said that Viggo Widerøe was among those who laid the foundations of the resistance organisation, *Milorg*:

I got to hear about him right away. We were already beginning to think on 9th April, and he was among the very first pioneers who brought *Milorg* into being. I didn't meet him personally then, as that would have been too risky. The more you knew, the greater the danger. He didn't know my name either, just my codename "24."²¹

In a document presented to the Norwegian Parliament in 1948—'The Government and the Home Front During the War'—Viggo Widerøe the aviator is among those named as having taken part in the historic meeting where the decision was made to set up a military council.²²

'But it was because of the traffic of escapees that he was caught,' Sønsteby said. 'And he was caught early on. Somebody had been a little sloppy. He was helping people to escape to Great Britain. That was one of the most important things people could do, to get people out who had to leave, over to England or to Sweden'.

Viggo had been doing one of the things the Germans cracked down upon hardest. He was arrested and condemned to death but had the sentence commuted to ten years corrective detention. He survived. After the war he and Sønsteby became close friends. And to complete the picture, we should add that Viggo's wife Solveig was also active in the Home Front. She was one of the women who worked in immediate contact with central parts of the resistance movement, in the circle around Gunnar Sønsteby. With two young children in the house, she sheltered British officers on missions in Norway. When Birger Rasmussen, a member of *Kompani Linge* and of The Oslo Group, was shot and wounded she hid and looked after him before he escaped to Sweden. Sønsteby wrote in her obituary that she was 'an important person in the resistance movement from December 1942,' in other words nearly all the time her husband was in prison.²³

A Handful of Norwegian Physicists

In fairness, it should be put on record that if we look carefully we can find contemporary Norwegian physicists who recognised Rolf's contribution. Particularly deserving of mention are the two scholars who arranged and took part in the interview with Rolf when he was in Norway on summer holiday in 1983. Jan Sigurd Vaagen has since lectured about Rolf's betatrons to his students in Bergen, and he has also spoken about Rolf's contribution in a lecture at an *Academia Europea* seminar about accelerators. Finn Aaserud in his role as Manager of the Niels Bohr Archive has been interested in Rolf as part of the big picture of the history of science.

Another professor from Bergen who has since expressed great respect for Rolf's contribution is Egil Lillestøl, who worked at the CERN Research Centre in Geneva. He has held regular courses for physics teachers and written popular scientific articles, and Rolf is included all the way. Lillestøl's explanation of why Rolf did what he did during the war sums up the thoughts of many:

- He knew within himself that he hadn't done anything wrong. What other people thought was not important to him. I think that Rolf saw his great research opportunity, followed his chosen path and decided to ignore everything to do with the war.²⁴

Odd Dahl, also from Bergen, is another who has taken an interest in what happened to Rolf. He and Rolf had worked closely together in the starting phase of CERN. This was Dahl's judgement:

When the war came, he went back to Germany to continue his work – not from ideological convictions but rather because he was totally absorbed in his research. That made things difficult for him in Norway after the war. He was arrested, but some of us who knew him quietly managed to get arrangements made for him to be allowed to leave the country. He did well in Switzerland as Director of Research at Brown Boveri, and I have worked with him on several occasions.²⁵

There were some others. One of them was Gunnar Randers, the colourful astrophysicist and Alsos Captain whom Rolf though had been instrumental along with Dahl in getting him out of prison. This is the same Randers who was a member of the expert committee set up by Oslo Police Department during the legal proceedings, and who wrote in *Dagbladet* that Rolf should be treated as a traitor. And—he is the same Randers whom Rolf communicated with after the war, about establishing a research institute to help rebuild the country. But despite his professional curiosity, Randers never took upon himself the role of rehabilitating Rolf. It can be claimed with some justification that Randers pumped Rolf for his knowledge and then stabbed him in the back in connection with the legal case.

So some did see and recognise his genius. But the Norwegians who over the years have advocated Rolf's case loud and clear in his homeland can be counted on the fingers of two hands. What they all have in common is that they have spent a lot of time abroad. Randers and Dahl in the USA and Geneva. Lillestøl also in Geneva. Brustad in the USA. And the colleagues Aaserud and Vaagen with experiences from USA, England, Denmark and Russia. In leading position are the two foreigners who have taken a special interest in Rolf. One is Søren Bentzen, the Dane with special expertise in ethics who has lived for long periods both in England and in the USA. The other is Rolf's biographer, physicist Professor Waloschek—born in Vienna, grew up in Argentina, long resident in England and finally many years in Germany.

The entry about Rolf in The Norwegian Biographical On-Line Dictionary states simply and uncontroversially that 'After the Second World War Widerøe moved to Switzerland.' It says nothing about where he was during the war. Skilfully omitted. But it does say that the reason he moved back to Norway *before* the war, after several years with AEG in Berlin, was among other things because 'the new political circumstances were not to Widerøe's taste.' A sort of indirect answer to our question. Several other articles in works of reference say much the same.

A Nobel Prize, Him?

Even several decades after the war it was suspect to be too positive about Rolf, lest there was anything in the rumours that he had been a Nazi. In the 1980s, when he was over 80 years old, there was a move to have him nominated for a Nobel Prize. This was initiated by people from what is now The Norwegian University of Science and Technology, in Trondheim. Two who disregarded the fear of being associated with Nazism were the Professor of Technical Physics, Sverre Westin, and the holder of a government scholarship, Olav Aspelund. They both gathered documentary evidence and mobilised their contacts. But they didn't win support among Norwegian physicists, especially in Oslo.

Aspelund had written an article in *Morgenbladet* for Rolf's eightieth birthday in 1982, and had arranged for Rolf to deliver a lecture both in Geilo and in Oslo the following year. A problem with Aspelund's involvement in Rolf's rehabilitation was that he was not always taken seriously by colleagues who thought that he was too submissive and uncritical in his admiration for Rolf. To some people, his enthusiasm to support Rolf seemed self-defeating. Aspelund was a nuclear physicist who was living in Germany in 1971 when he read the featured interview with Rolf in *Aftenposten*. Until then he had only associated the name 'Widerøe' with the airline, but now he immediately got in touch with Rolf, as he told me in an interview during the preparation of this book.

I think it was scandalous how he had been treated. I think the verdict should have been nullified.²⁶

He told me that he then wrote a recommendation to The Royal Swedish Academy of Sciences, recommending Rolf for a Nobel Prize in Physics.

That is to say, I wrote it and then I got Sven Oluf Sørensen at the Physics Institute at Oslo University to send it, for he was a professor and I was not. I also tried to get several other people to nominate him, but my impression was that Rolf was regarded as a non-person.

But other, more powerful voices were calling for a Nobel Prize for Rolf. Parallel with the Norwegian initiative, things were also happening during the 1980s in the USA.²⁷ Professor Robert Hofstadter at Stanford University, himself a Nobel Prize-winner, nominated Rolf for the Physics Prize before the 31st January nomination deadline in 1985. He proposed a treble-shared prize with the Americans Kerst and O'Neill. Hofstadter's nomination proposal was based both on Rolf's pioneering studies of the principles of particle accelerators and on the use of the technology in cancer treatment, 'to the benefit of humanity.'²⁸ But the proposal didn't succeed.

In 1992 the Director of the DESY Laboratory in Hamburg took a new initiative with a view to nomination.²⁹ Sverre Westin was involved in this attempt too. He wrote to the director, saying that from a purely objective point of view:

...there can be no doubt that Widerøe is worthy of nomination for either a whole or a shared Nobel Prize on the basis of his unique contribution to accelerator technology. He has surely made a contribution on a global level, even though so far as I know he has not personally made any discoveries in nuclear and particle physics.

This was an objection many people raised, that Rolf had not made a discovery in physics itself, but in the *application* of the laws of physics. Sverre Westin thought that the same could be said of Lawrence, who had found Rolf's betatron sketches in the library and got the idea of building the cyclotron that had won him the Nobel Prize. He commented:

So far as I know, no nuclear physics results were put forward in that instance as a basis for the Nobel Prize.³⁰

Sverre Westin took up the case with the President of The International Union of Pure and Applied Physics,³¹ who was a former Chairman of the Swedish Nobel Committee, but he thought it was now too late. It was now many decades since Rolf had launched his theories and built his betatrons. Westin considered that this need not be a hindrance, as Lars Onsaker had received the chemistry prize almost thirty years after presenting his theory. Nor should Rolf's own age be any obstacle, even though he was now 90, as the Norwegian Trygve Haavelmo had received the prize in economics when he was almost 80. But anyway, and despite the fact that he was looking for good arguments, he was cautious enough to write to the DESY Director:

I really fear that there is not much hope of achieving a break-through with a proposal for a Nobel Prize for Widerøe when not even Hofstadter's proposal won support.

And that was presumably their conclusion, for there is no knowledge of any nomination being submitted.³²

In Switzerland, the thought had already been aired in the 1970s, when a physicist at a meeting arranged by the Technical College in Zurich said 'I

wonder why my colleague, Professor Widerøe, has not received the Nobel Prize for his works.³³

The Danish physicist and medical doctor, Søren Bentzen, is in no doubt, however, and he says plainly:

He was cheated out of a Nobel Prize. Because Widerøe should quite certainly have shared the Nobel Prize that was given to Lawrence. There can't be much doubt about that. If what Nobel Prizes do is to reward original and ground-breaking ideas, Widerøe should certainly have had his share of it. Lawrence did the right thing afterwards in always recognising him. He has said on many occasions that he read Widerøe's dissertation and that he understood the idea immediately and went ahead with it. But Widerøe was the trail-blazer. He met strong opposition and had many doubters, even among well positioned people who thought that it would never work. But he won the battle. Modern accelerator technology stands in great debt to Widerøe. And to Widerøe's discoveries. His professional reputation is undisputable. He is a major figure in the history of radiotherapy and radiation physics.

The former director of IBM's research centre in Switzerland, Karsten Drangeid, says the same:

Widerøe should have had the Nobel Prize for Physics.

Sharing the prize with one or more of the three Americans Lawrence, Kerst and O'Neill is what was most often suggested when people discussed the possibility of a Nobel Prize for Rolf. Lawrence invented the cyclotron, on the basis of Rolf's doctoral thesis. Kerst built the world's first betatron, on the basis of Rolf's doctoral thesis. O'Neill, who developed storage ring technology, did so independently at the same time as Rolf was taking out a patent on the idea in 1943. Rolf was proud of this idea but kept it secret for many years because of the war, and machines using this technology were not built until the 1950s, at CERN and elsewhere. O'Neill and Rolf understood that they had been working in parallel on the same topic. They admired each other's work and they later met several times.

After several years Rolf received a letter from one of the key people in the Accelerator Department at The Brookhaven Laboratory in the USA. The author of the letter was concerned on Rolf's behalf. He had noticed that people referred to Kerst and O'Neill, but not to Rolf, when they discussed colliding beams. He said that he had checked the documentation the Americans had presented at a conference at CERN in 1956 and had not found any reference to Rolf. He had now written an article to rectify this omission, but he wanted to show it to Rolf before it went to print.

In the article he wrote that ‘It has recently become clear to us that this was suggested much earlier by the multi-talented inventor Rolf Widerøe.’ He described Widerøe as the man who had founded accelerator technology with his doctoral thesis in the 1920s and who had made an important discovery while on holiday in Telemark in 1943. And then follows the now legendary story that begins with the words ‘One fine summer day as I lay on the grass, watching the clouds roll by...’

He went on to write that Rolf had immediately tried to register a patent, but that it had not been granted until many years later. In the meantime Rolf had developed the idea further and drawn up several proposals for the construction of a machine with ‘colliding beams.’ The article concluded with references to publications that confirmed the truth of this and stated that ‘It is our impression that Dr. Widerøe deserves a large share of the credit for CERN’s success with the ISR machine.’³⁴

Behind the Scenes

The close relationship between Lawrence’s research and Widerøe’s research is mentioned in a book published in the USA about what goes on behind the scenes in the selection of Nobel prize winners.³⁵ The book is written by a scientific historian, and it is generally critical of how individual people or groups have tried to use the prize to advance their own scientific, cultural or personal agenda. The book claims that in Lawrence’s case the committee awarded him the prize for his promising work on the cyclotron—rather than to somebody who really had made a discovery—because they wanted to help him to obtain the vast sums of money he needed for the work.

A chapter entitled ‘Cyclotronists of the World Unite,’ tells of the discussion prior to the award to Lawrence in 1939. One of the objections was that he was part of a team with many assistants and therefore could not be given sole credit for the achievement. There is mention here of Rolf as one of the people who inspired him and of how this happened, but without suggesting Rolf as a candidate. The book describes the 1930s as a hectic time scientifically, with an active climate that made it difficult to promote candidates. There were few nominations in the time before the outbreak of the Second World War and Hitler’s ban meant for example that Germans were excluded. The growth of a new international way of doing physics, Big Science, was also a weighty consideration. Some people thought that the Europeans, Cockcroft and Walton, deserved the prize before the American, Lawrence, though they too finally got it.

The book starts with the words ‘The Nobel medallion is etched with human frailties. Both those who select winners and those who receive the Nobel Prizes are, well, mortal.’ A warning that both to receive and not to receive the Nobel Prize can be the result of error. A Nobel Prize is not a last judgement of ones contribution to research.

One person who cannot professionally assess Rolf’s eligibility for a Nobel Prize but who has a purely personal view of it, is his grandson and adopted son, Per Trifunovic. He sums up soberly:

He could perhaps have got it if the war had not been an issue, if he had just worked in Norway.

If I had not been for the war ... well, perhaps. But the war was real, and so this was just speculation. And even if the war had not happened, the ‘perhaps’ would still have been there.

In the Wrong Place

In later times, Rolf had support from unexpected directions. Finn Lied, an electrical engineer by profession, was admitted to the Science Academy in the 1970s. He had been critical of Rolf’s stay in Germany during the war, but he was not dismissive of the suggestion of a Nobel Prize for Rolf.

It wasn’t so unnatural to think of him. He was very early with linear accelerators, which have later proved to be a very important tool. But there was something or other that prevented him from being embraced by the Norwegian people.

Lied couldn’t remember whether there had been talk of setting up a bust of Rolf at the university:

I don’t remember, I can well imagine – that if somebody asked me today whether he should have a statue at Blindern – then I would say no. Simply because we don’t set up statues like that. It would be inappropriate. No; no statue for Widerøe. No, I must admit that after four years at war I have become less sympathetic, no. But I can’t remember being opposed to the proposal. But I have opposed so many things, so it may well be that my memory fails me.

I’ve been told that when this was under discussion, either you or Jens Chr. Hauge said that he shouldn’t be remembered, and shouldn’t have a statue.

I can’t remember that. Myself, I haven’t been interested in him or his subject area, which was particle accelerators, that has never interested me. But he was an important man. There’s no doubt about that; very important.

In what way?

He was ahead of this time. The accelerator he was working on for his doctoral thesis, it was not achievable with the electronic technology of that time. But he later became a consultant at CERN and these other Norwegian physicists of the time, such as Tangen and others, they were just children in comparison with Widerøe.

Hylleraas too?

No, Hylleraas was really a theoretician. But Odd Dahl, he was a pioneer. He had a real understanding of exactly what Widerøe was working on. But there is a danger there, I would advise against making Widerøe into some great hero. He wasn't. He was a very clever engineer. But there was something about Widerøe I haven't managed to grasp. I've never really understood his stay in Germany during the war. There may be some unsolved puzzles there. But if his conscience was clear, he behaved stupidly. The public impression was that he was in the wrong place at the wrong time. But that he hadn't done anything particularly wrong; he just worked in Germany during the war. Many Norwegians did that, he wasn't the only one. It's different now, we are more relaxed. We don't have the concern we had at that time in relation to those who had not been in the right places. But when I try to put myself back to that time, then it couldn't be accepted.³⁶

... And in the Right Place

A parallel—and contrasting—case to Rolf is the four years older chemist Odd Hassel, who did the 'right' things. Grew up in Oslo, student in Germany, doctorate in Germany, wrote his scientific articles in German. And then—when the war came—he began to write in *Norwegian*. In Norwegian journals. And after the war—then he published in English, not German. He got a bust in the science library at Oslo University. And he got a Nobel Prize, shared with a Brit.

This is the man whom 'The Griffin,' the German Paul Rosbaud, probably used as a courier to British intelligence services and whom the Americans are said to have tried to recruit as an agent. In 1943—about the time Rolf went to Germany—he was arrested and sent to Grini where he gave lectures for his fellow-prisoners. His publishing in Norwegian may have provoked the occupying power.³⁷

Most Norwegians say that they don't know enough either to condone or to condemn Rolf's stay in Germany during the war. This applies both to scientists and to others. One person who said that he felt the lack of

information about Rolf was Haakon Sandvold, former Director-General in Årdal and Sunndal Verk, himself a civil engineer in a related field and an important figure in the politics of research for many decades:

I have never been totally clear about what Rolf's contribution was. I have heard a lot of opinion that he was a Nazi, but I don't know enough to assess that. But he must certainly have been so committed to work through his ideas that he looked for German contact.³⁸

Among other things, it was this lack of factual information that Tor Brustad at the Radium Hospital wanted to put right. He thought there was a responsibility to ensure that the public got to know about Rolf's contribution to science, so that he didn't remain the 'footnote' in the history of physics in Norway that Brustad thought he had become.

But documentation and facts are not always enough. Feelings don't follow factual answers. It doesn't necessarily help if the formulae and formalities are correct. Everybody who lived then, knows that. You just don't go to Germany in 1943. Not unpunished. And Rolf *had* worked there during the war. On a project under the wing of the Luftwaffe, even. How could he? Be so stupid? Much of the scepticism was because of lack of information. But some people didn't want to know. Or they didn't want to let other people know what they knew. And where information is lacking, rumours flourish.

Nothing is just black or white. In the interview with the physicists, Rolf said that he had been described in an article as an 'obscure' person, and that he wasn't sure himself what the author meant by that. One possible interpretation is 'morally doubtful.' Many people thought that was hardly an exaggeration. Even after Tor Brustad's input at the X-ray conference in 1997 and his article in *Acta Oncologica* a year later, the physics community in Norway hesitated to be persuaded. Nor did the institution of a special prize in his name help very much. There was no big recognition. All the demonstrations of respect abroad—the prizes, the talks, the honorary professorships—counted for little. Brustad had washed his name by digging out the case papers, and his little group of Norwegian followers arranged for some articles in strategic places. In *Morgenbladet* for his eightieth birthday, in *Bergens Tidende* and *Aftenposten* for his ninetieth birthday. That didn't make him a hero. But more recently he has appeared on the website *forsking.no* and in the on-line lexicon. Little by little, as the wartime generation dies out, he is finding his place in the history of science even in Norway. Not as big a place as he could have had if the circumstances had been different, but a place. At last, people will ask not 'What was that business with him during the war?' but 'What was his contribution to science?'

‘Something’

Karsten Drangeid, one of the people who worked with Rolf in Switzerland in the 1950s, said he had the feeling that his boss didn’t want to speak about the war.

I think he had a difficult time afterwards, but he never said anything about that. There were some things I didn’t know until I read Waloschek’s biography – that he had been in Germany during the war, and that he had done what he did in order to help his brother. The fact that something is legally permissible is not the same as that it is morally acceptable, and if he believed that his brother’s life depended on him going, I can understand from my own experiences during the war that it must have been difficult for him.

It is difficult to say how many people were fully informed about Rolf’s situation right after the war. Maybe no-one. There is much to indicate that even those closest to him didn’t have the full picture. Neither his siblings nor his parents. His wife, possibly. Yes, his wife, according to Vaagen. But the children were too small when things were at their worst and the day never seemed to come when the grown-ups would sit down and say ‘Now we’ll tell you the truth about Daddy’s stay in prison.’

Those whom it most affected found ways to live with what they knew—and with what they didn’t know. They heard a little here and understood a little there. People didn’t speak about details from the war; neither those most affected nor those round about them. With children around and people needing to be rehabilitated, consoled, helped to find their feet again—that is not the time to bring out painful and difficult topics. Not then, and not since. It is done thus with best intentions, not to hold things back but to be done with it, put it behind. Sometimes deliberately. Move on. The war is over.

The fretful, anxious confusion that must have lain over people because they didn’t know, or knew something but not everything, is long gone. Children and grandchildren, brothers-in-law and sisters-in-law and their children have picked up the pieces, carried them onward and thought their own thoughts. Each generation has understood it in its own way. Everybody knows that there is ‘something,’ as Rolf’s adopted son expresses it. But nobody knows entirely what that ‘something’ is. Interviews with close family members tell us mostly how little they have been informed, and how late they were in getting to know what they do know—often only after Waloschek and Brustad looked into it in the 1990s:

Per Trifunovic (grandson and adopted son):

We didn't talk about that. I never discussed it with Father. And when I heard about it, heard that there had been a "dark chapter," then I got a sort of explanation – what the official version was – and then nothing more was said about it.

Did you get it from him?

No, from Mother.

So it was your grandmother and adoptive mother, Ragnhild, who had to tell you about "the dark chapter?"

Yes. I had heard that there was something about the war. I don't know how I got to hear about it. I haven't thought so tremendously much about it, but I could never imagine that he was a Nazi. And therefore it wasn't so important for me either.

How did she explain it then?

What I learned, was that Viggo was in the resistance movement in Norway and ended up in a concentration camp in Germany, and that Father had agreed to work for the Germans so that Viggo would get better conditions in prison. Father apparently had no real problems with this afterwards. He was a short time in prison, and then there was an investigation, and then he was free again. And then they went to Switzerland. To develop the beta-tron, but otherwise I don't think this was any hindrance.

But there is a legal document saying that he worked for the Germans during the war. He had written a pro-German article and he had given money to a pro-German organisation. And these two things, the article and the donation...

as if that was the main evidence?

The time and the mood in Norway at that time were such that if you had spoken with a German, then you were a Nazi. And if you had been in Germany you must surely have been a Nazi.

Yes, he did work for the Germans, but I don't know what impact that had on the war. But he worked contrary to his fellow-countrymen's feelings of loyalty. We just have to accept that's how it was.

Other people might have thought that if they felt themselves unjustly treated they must fight back.

Yes, the question is how unjust it was – that's the other side. I don't know. I only know what I have heard – and that he collaborated in order to help his brother.

Do you know if it bothered him that his reputation wasn't restored in Norway while he was alive?

I don't think he was concerned about that. I don't think he was really so excited about getting honours and honorary doctorates here and there.

He was given many honours internationally.

He was indeed. But I don't think he worked to get them. They just came. And if they came, that was fine. He was pleased about them. But if they didn't come, that was OK too. The honours weren't what motivated his research.

Has it ever occurred to you that he might have been a double-agent?

No, never.

The person who was his administrative manager when he worked in Germany during the war, and whom everybody believed was a Nazi, was really a British spy.

Ah, yes, that was interesting. No, I've never thought about that. It could be, but I don't know. Do the official investigations say that he was a Nazi, either?

No, they don't say anything about that.

Now young people hear about war every day and are doubtful about national boundaries—he was ahead of his time there.

Yes, the world just didn't think like that. But I believe he thought like that.

I think he went because the work was interesting. And the whole political business interested him so little that he didn't foresee the consequences.

And if he could also help his brother, then it's understandable.

Have you met his brother, Viggo?

Yes. We were always in touch with Viggo. The two brothers always had a good relationship. And what I heard was that Viggo was in a concentration camp in Germany and that Father had agreed to work for the Germans so that he got better conditions. In the family – even in the Widerøe family in Norway – none of the brothers and sisters was basically very concerned about the war. What I believe – if you think it's alright to write this – was that he was politically very naïve. It's quite possible that there was more than just wanting to help. A bit of naivety. He did travel a lot, and lectured all over the world. In China he was very impressed by Mao. And when he was working in the garden, he always wore a blue Mao tunic. He didn't see anything wrong with that. He thought Mao had achieved a lot. What definitely impressed him was how they planned and were focussed on science. But the fact that he could be fascinated by Mao, who was so extreme, shows that he basically wasn't really interested in politics.

Per Trifunovic also refers me to the others and doesn't want to claim a monopoly of the truth. When I thank him for our conversation, he says:

It's exciting for us too, that we need to think a little. You've also given me lots of information I didn't know about.

It is symptomatic that when the members of the Widerøe family are interviewed, the situation is often a little inverted, not quite upside-down but to the extent that the questioning turns into a dialogue. Everybody wants to

know more and to share what they do know. The pictures should be completed. The nuances should be explored. Speak to this person and this person. Maybe they have a different understanding.

What does this tell us about Rolf? That he was a man of many facets, and that people saw different aspects.

The Sons and the War

It is interesting to fill in the picture by asking the generation between Rolf and his grandson, i.e. his own two sons, what lasting impressions they have of what happened during the war. Arild, the elder, was four when his father went to Germany during the war and eight when they moved to Switzerland. He answered thus:

Did your father tell you anything about his work in Germany?

No. No. But, I don't know, I suppose I could have asked him. I didn't think it was anything particularly interesting to know about. Perhaps I preferred not to know. Because I knew that Viggo had had a very bad time during the war.

The younger son didn't ask either.

Rolf Widerøe jnr. (younger son):

All of that business about the war – I really didn't know all that until Waloschek's book came out in 1993. I had no idea about it. Only heard about it later. But I knew that he had been in Germany. And when we came here to Switzerland, some people said that he had worked on these V1 and V2 rockets. But it wasn't as if I went straight to Father and asked him if that was true. I just let it be. And then it became apparent that there had been nothing to do with the V2 or the V1. People here knew that the Germans had used these rockets. I may have heard about it from some of my classmates at school, and they may have heard their parents talking about it, who may have known about Father and his job during the war.

And with the mood in Norway as it was then, can you understand the reaction?

Absolutely, yes. Yes, I'm saying nothing about that. Oh no.

When you as a family were in Norway, did you notice any suspicion towards you?

No. No.

Or antagonism?

No. Never. Never.

Was there any sign that the other parts of the family didn't want you to visit them during the war because your father was in Germany?

No, no.

Have you yourself subsequently experienced any consequences of your father's stay in Germany during the war?

Some years ago, here in Switzerland there was a lot of concern that people were being subjected to secret surveillance, and the authorities had to allow anyone who wanted to do so, to ask for copies of the contents of the folder. I asked for that, and do you know what was in it? Everything possible about my father having been in China and so on.

Rolf jnr. referred to his grandmother's German ancestry. He pointed out that his father spoke German well, studied in Germany and then worked there for several years. So he probably did not see Germany as the great enemy in the way that people did who had never had anything to do with the country. He had many friends and acquaintances there.

The last member of the family to whom I asked the question was Egil Reksten:

Egil Reksten (brother-in-law, married to Ragnhild's sister Louise)³⁹:

What is your view of your brother-in-law's activity during the war and his arrest when he came home? You were in a concentration camp.

We can say that what ought to have been done was for example to find out whether he had done anything directly wrong. That was what I think nobody tried to find out. Was that so?

Now afterwards Professor Tor Brustad has been in the National Archives and read the case documents, which state that there was no basis for the accusation.

I have never in any way thought of him as a traitor, I've not done that. I couldn't see him that way.

According to Brustad he shouldn't have been imprisoned.

No, I really don't think so either. On the other hand, feelings were running very high, weren't they?

Yes, but how much is one allowed to ascribe to that?

No, I really don't know what I should say about that. In a situation like that, things are done that are later found out to be unjust. And it can be that there is a sort of necessity in that, yes, that there is a sort of psychological need – people are much stricter and less reflective than they should be.

Why, Why?

Yet again. The big question remains. Even after speaking with those who were close to him. What made him travel to Germany in 1943? There are several explanations.

One is that he was absorbed in his research and looked neither to right nor to left. That is the simplest explanation, and many members of the family incline towards it. But some qualify it by questioning whether he went voluntarily. They say ‘more or less voluntarily.’ Or even that it was forced labour, something he was called up to, *dienstverpflichtet*.

Others, such as Tor Brustad at the Radium Hospital, maintain that he went to help his brother and add that he was politically naïve. But he also puts weight on Rolf being attracted by the professional opportunities.

All this may be so, but then along comes Søren Bentzen who reads the scales a little differently. Just as much in Rolf’s favour, but casting doubt on the explanation involving the brother and advancing instead the possibility that had arisen for Rolf to realise his dream.

Perhaps the thought occurred to Rolf that there were not many people who were capable of understanding this, appreciating the professional and scientific implication. It was better to keep it simple for them with the explanation that he went to help his brother, and that the Germans got his work on the betatron in exchange. For he held consistently to the explanation that he went with a view to helping his brother.

Perhaps he thought quite objectively that what he was doing was not significant for the war effort. What other people thought was not so important, as they didn’t have the technical knowledge. So he chose to rise above public opinion and rumour. Did what *he* thought was right. His conclusion was that the development of a betatron with the energy level that was being spoken about could have no possible importance for the conduct of the war. History has proved him right.

It is not easy to pass judgement on this. When everything has been relived and turned over and weighed—and come to a distance—only then can we possibly see and say what was really going on. Or perhaps not even then. Life moves on, even in time of war. We must also take into account that not everything was spoken about. Neither then, nor since. That was part of the package and of the pact. There were obvious security reasons for this, but also some personal reasons that should not be discounted. This, combined with the fact that after the war it was disruptive to talk about things that might have a Nazi element, has led to there being things for which it is difficult to find a good explanation retrospectively.

Tor Bustad called it the ‘tragedy’ in Rolf’s life, the contrast between on the one hand his success and everything that went so well for him in the wider world, and on the other hand that he didn’t receive recognition in Norway—all because of the treason case. Rolf’s grandson, Per Trifunovic, called it ‘The Dark Chapter.’ But Rolf should not be seen as an unfortunate

victim because of this. He used the opportunity, even if he was forced to it. Either way, he rose above the public rumour and he was not concerned to do anything about the judgement. That wasn't important. At any rate other things were more important, according to Brustad:

I think he knew that many people didn't like that he had been in Germany during the war, obviously he knew that. But his fanaticism for utilising his talents at whatever cost, plus his brother's position, led him to go. He would become famous for bringing his idea to reality. And then the matter of his brother crops up, which leads to the Germans serving the opportunity to him on a tray. The fact that he kept in not only with Brown Boveri but also with both Siemens and Philips, also shows his capability and his will to go to where there was something to be had. This 'cynicism' was part of his character.

We can continue asking: What was going on in his head in 1943 when representatives from the Luftwaffe met him outside his office and in best spy style invited him to accompany them to a meeting at the Grand Hotel? Why did he go with them to negotiations in Berlin? Why did he settle in Hamburg? Did he have no choice? Was he tricking the Germans or were they tricking him? Was he naïve? Blind? Cynically calculating? Who was using whom? Who was a liability or an asset to whom? Was Rolf using Viggo rather than trying to help him—as a pretext, a cover for something else? Was the story about helping his brother just an excuse? What did he really do for Brown Boveri during the war? What was really going on?

We cannot know. The answer becomes a repetition of what people thought then, what they have thought since and what they think now when they are asked about things that happened so long ago. It becomes digging for source material, investigations and analyses. The more we learn, the more questions still face us. Sometimes an interview inverts to the interviewee asking the interviewer. And the more objective facts emerge, the more curious I become about what I don't know. Not about what he did, not even who he did it for. But why. That is what I wonder about. The human factor. Call it the psychological, philosophical, existential side if you wish.

Going to Germany in the middle of the war? He must have been mad.

But then this business about his brother sneaks back into the story. The factor that some say is the main driver and others just call a vicarious argument. His brother, who had been so close to him as they grew up, when they were students, while the family was founding the airline. The pair who had walked to Sognsvann after school, drunk beer in the student flat in Karlsruhe, gone on ski holidays in the Alps, been surrounded by their loved ones on Easter holiday in the Norwegian mountain home, watched

their children bathing together in their grandparents' summer paradise on the Oslo Fjord. And who long, long after, when they were pensioners, still holidayed together every year at Viggo's country house in Spain.

Is the answer to the big 'Why?' a combination of reasons? Is it so human? That he is absorbed in his project, suddenly gets the chance of his lifetime and wants to arrange it so that he combine it with a possibility of doing something for his brother? Or is he so cunning and cynical that he uses the latter to justify the former? The thought is painful.

There are many unanswered questions. But I think there are enough answers to give us reasonable grounds to know that he was not in league with the enemy. I haven't found any documentation directly to the contrary, to show that he was working with the Allies, but I have wondered about it. The Allies did however want to get a hold of him as the war was drawing to a close. This is shown by study of the British and American intelligence archives. And in the Norwegian National Archives the monstrous accusation of being involved with the V2 bombs is boiled down to three small points that resulted in a fine. But nowhere have I found anything to indicate that he was a double agent, even though his contact Hollnack was. Or is working for the enemy sufficient evidence of being in league with them? Many people think that, but fewer think he was a double agent. A Nazi in the sense of a member of the National Socialists he was not. Nor was he a Nazi ideologically. Quite the contrary. He came home from Germany at New Year 1932–1933 in protest against the situation in Hitler's Germany.

If he had refused when they wanted to take him to Germany in 1943, in the same way as his brother refused to allow the Germans to control his activities, what would have happened? Rolf chose the opposite, to comply with them. Seen in that way, the question of how freely he went becomes a philosophical and existential question more than a practical and political one. There are other solutions than the one we reach by logic and judgement, supported by all we have heard and read and allowing a little for contingencies. As one event follows another in most people's everyday lives. As we all navigate as best we can through whatever happens, with some grounded values as anchor-points.

I haven't found any master plan behind Rolf's engagement in Germany during the war. It is always possible in retrospect to analyse and try to see a pattern. Whether it was a temptation or a threat that directed him. Simply laying bare the facts is not sufficient to judge that. Nor is intuition. How much can we really know about somebody else? We know Rolf's official version and response, but nobody can read another's innermost thoughts.

If I could only have reached behind the façade, understood even more of his personality and what moved him. For there is something alluringly attractive in being able just to ‘forget’ the war and realise the dream. And then, in addition, perhaps being able to help a brother in need. Yes, when opportunity knocks, grasp it with both hands.

But what if he had afterwards done what another famous person did who had made a politically controversial journey and had the world against him? Paul Simon went to South Africa, played with African musicians and recorded his big Graceland album when the country was boycotted because of apartheid. What rescued him from judgement was that he bowed his head and said that he had been naïve. Paul Simon had understood that. The world forgave him. The record became a major hit and Simon became heroically famous.

But Rolf bow his head? Far from it. Not him, no. In his own eyes he had nothing to ask forgiveness for.

The Dream

He had his dream, a dream of a distant goal with many names. He had the results, and even more results. Responsibility. Self-denial. ‘Now I must see to completing it soon.’ ‘It is expected of me.’ ‘I expect that.’ He had a vision of great things that would happen one day. Now all the lines join up. Now all the formulae are found. Lucky are those who have a dream. He would have been in agreement with the founder of ‘Apple’ who said that the only way for people with such an obsession to be completely satisfied is to carry on with what they consider their great work, the task they dream of completing. Steve Jobs, ill with cancer at the time, must have known what he was talking about when he told graduating students at Stanford ‘How to Live Before you Die.’⁴⁰

Dreams and visions don’t operate by closed thinking, but they are more than loose flights of fancy. They say something about what kind of life we want to lead, and they can be realised.

For some people the dream is to create. Make something. Get something to work. Design something beautiful. Find connections. Do something nobody else has done, something that is just mine, that has my maker’s mark. Make a table. Write a novel. Plant a garden. Have a child. Arrange a festival.

For others, the dream is exactly the opposite—just absorb the experiences, sense the surroundings, let things happen and don't fret about the everyday things of life.

The dream is your own. It shapes you. It characterises you, but it doesn't excuse you.

Rolf followed the dream, *his* dream, mingled with the events and circumstances of his life. That is why his life was as it was.

The people around only saw it from the outside.

Notes

1. *Fredrikstad Blad* 4th April 2008.
2. Their sister, Maalfried Sørheim, in conversation during preparation of the book.
3. Guri Hjeltnes: *Hverdagsliv* ('Daily life'), *Norge i krig* ('Norway at war'), vol. 5, Asschehoug 1987, p. 27, separate edition, new edition 1990.
4. The biography.
5. The talk was given in English.
6. Interview with Søren M. Bentzen 22.11.06.
7. Finn Lied: *Dramaet Copenhagen* ('The Copenhagen drama'), *Forskningspolitikk* no. 1, 2000, published by The Nordic Institute for Studies of Innovation, Research and Education (known at that time as *Norsk Institutt for studier av Forskning og Utdanning, NIFU*).
8. In conversation during preparation of the book.
9. Waloschek's biography, foreword, pp. 5–6 (The prison stay was detention in custody, and strictly speaking 47 days.)
10. Waloschek: *Todesstrahlen* ('Death Rays').
11. 15th November 2010.
12. In conversation with me, 30th November 2006.
13. *Aftenposten* 17th July 1971 morning edition, p. 11, whole page 'Saturday Portrait: *Mange Columbi egg I hans kurv* ('Many dove's eggs in his basket'), written by Henning Sinding-Larsen.
14. The biography.
15. Video-interview recorded over two days, 22nd–23rd October 1992.
16. Interview in connection with the book 6th November 2006.
17. *Det Norske Videnskaps-Akademi Årbok* ('The Norwegian Academy of Science and Letters Yearbook') 1996. Meeting 11th January.
18. The initiative was dated 10th January 1973 and signed by Professors Aadne Ore, Alexis C. Pappas, Nico Norman, Per Finholt and Arnold Nordal.

19. 73, no. 2 pp. 39–47.
20. In conversation 6th November 2006.
21. Interview in connection with the book 5th January 2011.
22. London 28th October 1941, Jacob Schive to General Fleischer, *Regjering og Hjemmefronten under krigen. Aktstykker utgitt til Stortinget* ('The Government and the Home Front during the war. Documents published for the Parliament'), 1948.
23. Birger Rasmussen and Gunnar Sønsteby: Solveig Widerøe's obituary, *Aftenposten*, 25th September 1989.
24. In conversation in connection with the book.
25. Odd Dahl: *Trollmann og rundbrenner* ('Wizard and Maverick'), Gyldendal 1981.
26. Interview with me on 15th October 2009. (Aspelund used the word *dommen* [here translated as 'verdict'] in the sense that a *forelegg* that has been accepted and signed is equivalent to a formal judgement.)
27. Letter from Robert Hofstadter to Sverre Westin 23rd January 1985. Letters from Sverre Westin to Robert Hofstadter 8th January and 14th January 1985.
28. The proposal read: 'Rolf Widerøe—Nobel Prize for Physics 1984, for pioneering studies of particle acceleration principles, for fundamental and practical discoveries and inventions in the field of particle acceleration technology (a discipline founded by Rolf Widerøe), and for outstanding life-long work concerned with adaptation of particle acceleration technology to the requirements of industrial radiography, of nuclear and elementary particle physics, of radio-biology, and of high-energy photon, electron and pion cancer therapy, and all efforts purposely dedicated to the benefit and to the welfare of mankind.'
29. Letter from Sverre Westin to Bjørn Wiik 15th January 1992.
30. Letter from Sverre Westin to Bjørn Wiik 22nd January 1992.
31. Kai Siegbahn.
32. Letter from Sverre Westin to Bjørn Wiik 20th January 1992.
33. *Gespräch über Elektronenoptik* ('A discussion about electron optics')/ Participants: Rolf Widerøe, Enis B. Bas, Giovanni Induni, Lien Wegmann, Herbert Sprenger, Walter Willy Zürich: ETH-Library [Prod.], 1974, 2 digital audio tapes (total 169 min) + supplement (typescript, 91 pages, various publications and photos) *Aufzeichnung der Gesprächsrunde in der Phonotheek der ETH-Bibliothek, 29th August 1974/Widerøe, Rolf 1902–1996 Elektroingenieur Norwegen/Schweitz* ('Recoding of the discussion in the acoustic laboratory of the ETH Library, 29th August 1974/Widerøe, Rolf 1902–1996 Electrical Engineer Norway/Switzerland')//BGWFTS/Tape D 237:1–2.

The physicist who spoke about the Nobel Prize was Enis B. Bas.

34. John Blewett: 'The First Proposal for Colliding Beams,' News and Views, Particle Accelerators, April 1972.
35. Robert Marc Friedman: 'The Politics of Excellence. Behind the Nobel Prize in Science,' A W. H, Freeman Book, Times Books, Henry Holt and Company, New York, 2001.
36. Conversation in connection with the book 15th October 2009.
37. Edgeir Benum: *En forskerskole bygges. Odd Hassel og strukturkjemien 1925–1943*, ('Building a research school. Odd Hassel and structural chemistry 1925–1943') *Historisk tidsskrift bd. 88, s. 639–670, Universitetsforlaget 2009*. ('Historical Journal vol. 88. p. 639–670, University Press 2009') Vivi Ringnes, viten.no.
38. In conversation in connection with the book 14th September 2009. Sandvold died in 2010. He was born in 1921.
39. In conversation 21st December 2006. Reksten died in 2009. He was born in 1917. (He knew Odd Dahl well, among other things from his time at the Chr. Michelsen Institute and in 'The Royal Norwegian Council for Scientific and Industrial Research (NTNF.)
40. 'How to live before you die.' Graduation address by Steve Jobs the founder of Apple, at Stanford University June 2005, You Tube Video.

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