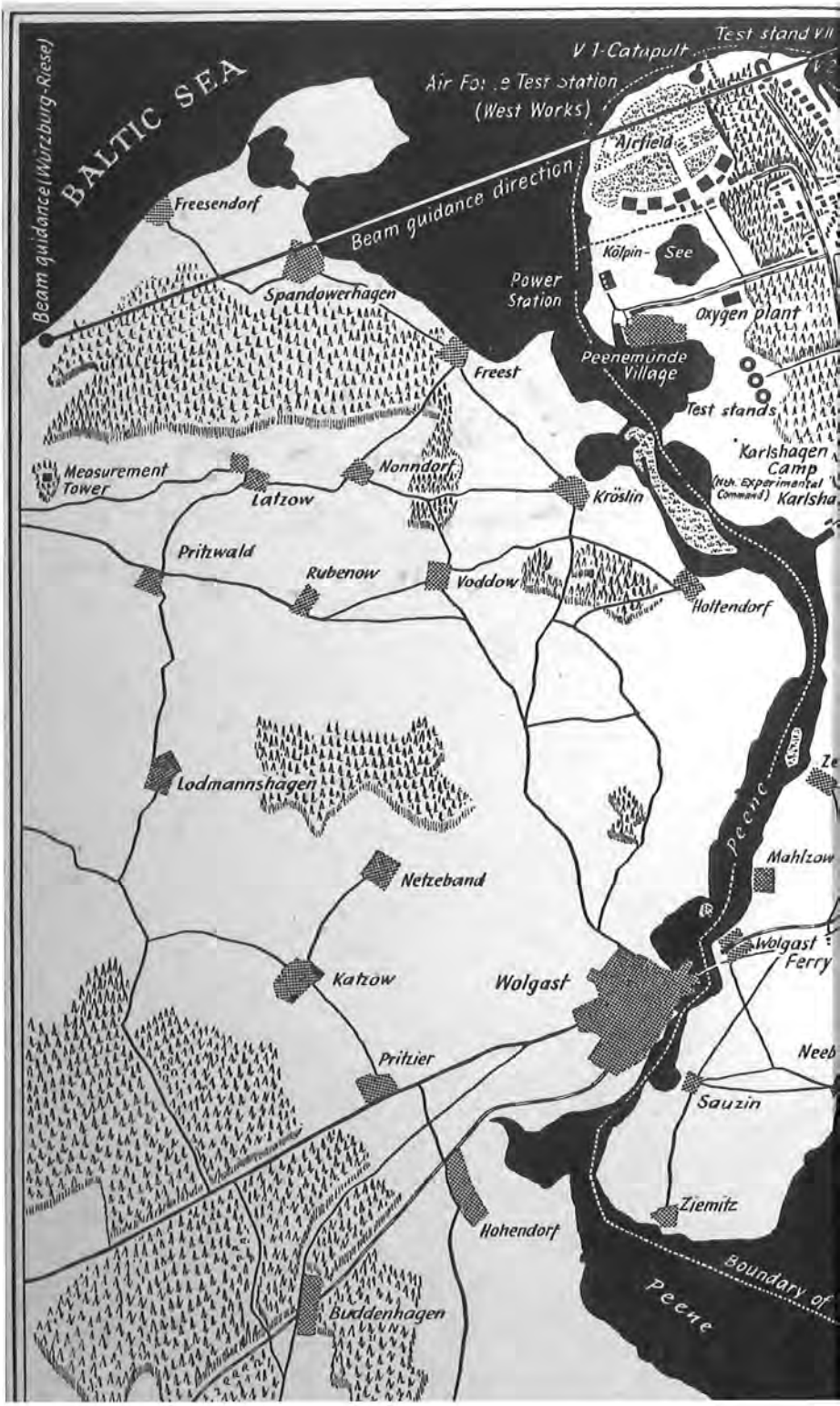
V 2

Major-General Walter Dornberger


BALTIC SEA
Beam guidance (Würzburg-Riese)
Freesendorf
Beam guidance direction
Spandowerhagen
Power Station
Air Force Test Station (West Works)
V 1-Catapult
Test stand VII
Airfield
Kölpin-See
Oxygen plant
Peenemünde Village
Freest
Test stands
Karlshagen Camp
(Nth. Experimental Command)
Karlsha
Measurement Tower
Latzow
Nonndorf
Kröslin
Pritzwald
Rubenow
Voddow
Holtendorf
Lodmannshagen
Peene
Mahlzow
Netzeband
Wolgast Ferry
Katzow
Wolgast
Pritzier
Neeb
Sauzin
Ziemitz
Hohendorf
Boundary of
Peene
Buddenhagen


Line of fire
Launching site
Test stands
Development Works (Eas Works)
Pre-production Works (South Works)
Settlement
PEENEMÜNDE
and District
0 1 2 3
Miles
N
W
E
S
POW Camp
Trassenheide Hutted Camp
Trassenheide
Boundary of prohibited area
BALTIC SEA
Mölschow
Bannemin
Zinnowitz
Kempin
Krumin
Neuendorf
Achterwasser
Netzelkow
Lütow
prohibited area
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FOREWORD

BY

WILLY LEY

ACCORDING to the official report of Air Chief Marshal Sir Roderic Hill[1], "the first hint that the enemy intended to use a long-range rocket for military purposes was contained in a report received in this country soon after the outbreak of the war. More was heard of the project towards the end of 1942, when agents reported that trial shots with such a missile had been fired shortly beforehand on the Baltic coast. Early in 1943 a connection was established between this activity and the German experimental station at Peenemünde.

Sir Roderic continued that "from that time onwards a stream of intelligence about the rocket reached this country", but towards the end of June 1944 the Allied authorities received more substantial information than mere agent's reports. During that month a German long-range rocket, used to test a guiding device for an anti-aircraft rocket still under development, had strayed towards the Swedish coast and ended its career in an airburst high over the Kalmar area. When a rocket breaks up at a great height the pieces, slowed by air resistance, never attain a high falling speed and 'flutter' to the ground without suffering much additional harm from the final impact. The Swedes had agreed to hand the wreckage over to the Allies and they had been flown to England by an American pilot.

The public, of course, was unaware of all this and received its first hint from a speech by Winston Churchill, delivered on 6th July, 1944, and referring to the flying bomb, V1. In that speech the Prime Minister spoke of Peenemünde, a place vaguely associated with "radiolocation and armament development" on the occasion of the big bombing of August 1943, as the "main experimental station both

[1] *Air Operations by Air Defence of Great Britain and Fighter Command in Connection with the German Flying Bomb and Rocket Offensives*, 1944–1945, published as a Supplement to *The London Gazette* of Tuesday, 19th October, 1948.

of the flying bomb and the long-range rocket", adding "at first our information led us to believe that a rocket weapon would be used". Since the invasion of the Continent was already under way there was some speculation as to whether the weapon would still be used.

It was. The first V2 fell at 6.43 p.m. on 8th September, 1944, at Chiswick, the second 16 seconds later at Epping and the rocket fire did not cease until 27th March, 1945, when at 4.45 p.m. the last rocket fell at Orpington in Kent. It was the 1,115th rocket to fall on England or within sight of the shore, according to Sir Roderic Hill's report: "2,511 people had been killed and 5,869 seriously wounded in London and 213 killed and 598 seriously injured elsewhere."

To the hitherto comparatively small number of people interested in rockets the development of the long-range rocket came as an enormous surprise. I was asked by countless reporters about the size of German liquid-propellant rockets, since I had known them prior to 1935. I could only reply that the biggest, finished in the spring of 1933, had been about man-sized. The largest rocket made by the American physicist Dr. Robert H. Goddard and fired on 31st May, 1935, at the Mescalero Ranch near Roswell in New Mexico had been somewhat taller than the German rocket I had in mind, had weighed a good deal less but had reached a height of 7,500 feet, while the German model stuck in its launching rack.

Every engineer and many military men were intensely interested in detailed information about this long-range rocket and in the story behind its development. A partial answer was supplied by W. G. A. Perring, Fellow of the Royal Aeronautical Society, in a lecture delivered on 1st November, 1945, at the Lecture Hall of the Institute of Mechanical Engineers at Storey's Gate, London. It was a very complete description of the rocket[1] with references to a number of other German developments which were most interesting in themselves but were overshadowed a few score times by the V2. But the lecture was concerned with the finished product only; it did not yet reveal why things were done the way they had been done. To mention just two items which puzzled me personally: why was there a set of eighteen burner cups in the head of the V2 motor? Why this particular number, why not, say, six? Or why had the designers bothered to have a set of external vanes attached to the large tail fins? The graphite vanes in the exhaust blast (the so-called 'internal vanes')

[1] Published in the *Journal of the Royal Aeronautical Society*, July 1946.

seemed to do their job well and the external vanes could work only for a short time, namely for the 30 seconds or so when the rocket was fast enough after its slow take-off but had not yet reached altitudes where the air grew too thin.

In the years that followed several valuable books on the V2 became available, for example, the four successive Upper Atmosphere Research Reports of the Naval Research Laboratory in Washington, D.C., and the volume entitled *Ballistics of the Future* by the two Dutch scientists, Dr. J. M. J. Kooy and Professor J. W. H. Uytenbogaart, who had witnessed V2 firings from Dutch soil. A small German book entitled *Kleine Raketenkunde*, by one Hans K. Kaiser, was the first publication known to me to tell a little about what had been going on at Peenemünde. But it was by no means the complete story; that had to come from somebody who had been much higher up in the organization, preferably at the head.

This book is the story.

Here all the many items which to an outsider were pieces, some fragmentary, of a gigantic jig-saw puzzle, are fully assembled. As will be seen, the Peenemünde Research Institute had its origin in a much smaller research station which is also designated by a place-name: Kummersdorf West. This had been the first rocket research station of the German Army. But even Kummersdorf West was not entirely without a background outside the German Army or any other army.

Just after the First World War, in January 1920, the Smithsonian Institution in Washington, D.C., had published a small treatise with the title *A Method of Reaching Extreme Altitudes*, by Robert H. Goddard. It was the first modern mathematical study of rocket motion and although it was based on some research with solid fuels —various kinds of gunpowder—it did, in one place, contain the hint that liquid fuels might be used for rocket propulsion. Three years later Professor Hermann Oberth had followed with another mathematical treatise entitled *The Rocket Into Interplanetary Space*. This book contained not only mathematical derivations but rather extensive suggestions for design and construction. The important point, however, was the emphasis on liquid fuels; Oberth stated clearly that only the change-over to liquids could eliminate the size limitation inherent in solid-propellant rockets.

It was this book that led directly to the founding of the "Society for Space Travel" in Germany in the summer of 1927. And the

example of this society caused the founding, first, of the American Interplanetary Society (now the American Rocket Society) and secondly, of the British Interplanetary Society, the first three of the many rocket societies now in existence and united in the International Astronautical Federation. The Society for Space Travel did try to raise the money to convert Professor Oberth's theoretical work into practical reality. It succeeded to some extent and built and fired quite a number of successful liquid-propellant rockets; but it must be borne in mind that in those days, from 1930 to 1932, a rocket was considered 'successful' if it worked at all.

It can be taken for granted that it was also Oberth's book which first aroused the interest of the technically trained officers of the German Army. Of course, even though Oberth himself had space travel in mind, and the Society for Space Travel expressed the same idea in its very name, the interest of the army was a military interest.

How this finally resulted in the long-range rocket which went into action during the last year of the Second World War is related in the following pages, by the man who was in command of the development.

CONTENTS

AUTHOR'S INTRODUCTION

THE memoirs of soldiers are generally controversial. War memoirs, especially those of a loser, often serve only one purpose—a congenial interpretation of historical events from the author's point of view.

This book is certainly conditioned by the author's outlook and by the nature and extent of his own experiences, as any factual account must be when it is written with limited access to official documents. Thorough historical research based on full documentation and evidence gathered from the participants may, if it is ever done, conceivably throw a different light on these events. For the understanding of historical actions, however, only the facts known to the protagonists themselves at the moment of their decision are in the last resort valid.

I decided to write this book because it deals with an invention which is certain to exercise a decisive influence on the future of mankind. I have tried to set down everything necessary to an understanding of the development in Germany of the liquid-propellant rocket between 1930 and 1945, including the circumstances in which we lived, worked, and achieved our successes, and finally the end of it all.

After the war a host of contradictory, confusing, and misleading books and articles were published on German rocket development. I do not know where the self-styled experts drew their information. The time now seems ripe to end the confusion and correct mistaken ideas once for all.

WALTER DORNBERGER.

Autumn 1952.