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Rocketry Mentors, Rocketry Practitioners and Unique Space Pioneers

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ABSTRACT

The Apollo operations on the Moon constitute a happening in the 20th Century that will be acknowledged in history for many centuries in the future. Historians and the Apollo participants themselves agree that an essential factor in the success of the lunar missions was the 'team' circumstances that prevailed. Hence, it is historically valuable to identify those team members who began their space careers in Germany and, after World War II, came to the United States and ultimately provided the experienced core of the Apollo rocket transportation team. It is informative to compile special lists of those core team members whose careers satisfy pertinent criteria.

1. Historic timeline

The first time humans left Earth and performed multi-objective operations on another body in our Solar System will be one of the happenings of the 20th Century that will be recalled in future centuries. Therefore, all the members of the team of engineers, scientists and managers whose knowledge made the Apollo missions to the Moon possible have a significant place in history. Obviously, the Apollo astronauts were prime members of this team and they richly deserve the recognition they have received. Also, within the total team of thousands, there was a leadership core of hundreds without which, the Apollo participants agree, the lunar missions could not have been possible.

This core group consisted of the people who, after World War II, were transplanted to the United States from Europe, mostly from Germany, to engage in rocket development for the U.S. Army. These individuals have here been given, arbitrarily, the designation: Transplanted Rocket Pioneers. The most pertinent of these individuals eventually came to the Army facilities in Huntsville, Alabama and subsequently were employed at the Marshall Space Flight Center during the Apollo period. The following text concentrates on these individuals. The focus here is on people, not events or hardware. Nevertheless, the following condensed timeline of events is useful.

In the late 1920's, a small group of European space enthusiasts, many of them young, began experimenting with liquid-propellant rocket systems. This interest led to the formation in Germany of the Verein fur Raunschiffahrt (VfR), or Society for Space Travel. Hermann Oberth, whose books inspired many members, was an early member. An initial milestone by the VfR was the static firing on July 23, 1930 of a liquid-propellant rocket motor designed by Oberth.

Subsequently, the VfR found a site, which they named Raketenflugplaz, where they could flight test rockets. Operations there began in 1931. The VfR activities there were sufficient to convince some German Army Officers that a more professional research and development effort was justified. In October 1932, they engaged Wernher von Braun to be technical director of a rocket development program to be pursued at an Army test range at Kummersdorf. Before long the rocket development and tests outgrew Kummersdorf, and the German military began preparation of a new site at Peenemünde. Von Braun and his associates moved their growing operations to Peenemünde in 1937.

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With the advent of World War II in 1939, a principal objective of the Peenemünde team became development of a military rocket designated A4 and later renamed V2. This development had a notable success on October 3, 1942 when an A4 flew as planned to an altitude of 85 km. The V2 became the first large rocket ever to be manufactured in substantial numbers.

As the Allied forces began capturing large parts of Germany, rocket development activities in Peenemünde and elsewhere terminated and the team closely associated with Wernher von Braun found refuge in Bavaria, where they awaited occupation by the United States forces. When the U.S. troops reached there, the assembled rocket team members surrendered. Subsequently captured missile documentation and V2 hardware were shipped to the U.S. Meanwhile, the U.S. military adopted a policy that offered contracts to key members of the von Braun team if they would come to the U.S. and pursue rocketry activities for the Army. A list of over one-hundred key engineers, scientists and managers was agreed upon and those on the list were transported to Fort Bliss, Texas. By this transplantation operation, the U.S. Army acquired an intact, experienced, rocket development team, the likes of which had not previously existed in the U.S.

After five years in Fort Bliss and adjacent White Sands Proving Grounds, where many reassembled V2 rockets were fired, the team was moved in 1950 to Huntsville, Alabama, where the Army permanently relocated its rocket development programs. In addition to the people who moved from Fort Bliss, during the following decade, there was a significant stream of past Peenemünde participants who now came from Europe to Huntsville to join their former comrades.

Even more importantly, many hundreds of U.S. born citizens were recruited to enlarge the Army Rocket Team. Eventually, in 1960, the then large team was transferred by executive order to the National Aeronautics and Space Administration (NASA) and became the Marshall Space Flight Center (MSFC), with Dr. von Braun as Center Director. In 1969, the team provided the leadership for the Saturn V Rocket that took humans to the Moon.

2. Data base for Transplanted Rocket Pioneers

The Rocket Pioneers arrived in the United States and in Huntsville at various times from 1945 through at least 1959. Also, they left U.S. employment over an even greater spread of dates. Thus, it is not a surprise that the several available lists of them contain some different names, depending on the often unclear criteria used in compiling each list.

To reliably identify those individuals who earned distinction by their contributions to the Apollo successes, it was advisable first to assemble detailed information on the career timelines of every person on any one of the available lists. Further, it turned out that some deserving individuals were found who were on no previous list.

Thus, stating in 2013, the Archives at the University of Alabama in Huntsville built a new collection by forming an individual information file for each of the people who, after World War II, came from Europe and became the core of the Rocket Team in Huntsville or had some significant tie to these Huntsville operations.

The individual Transplanted Rocket Pioneers files facilitated preparation of a one-page standardized summary for each person represented by a file. These summaries are online [1] and have been published [2]. The collection of two hundred eighteen files and corresponding summaries constitutes the base for the following analyses and discussions.

3. The Rocketry Mentors

The data base of individual summaries allows easy identification of informative sets of Transplanted Rocket Pioneers who satisfy various criteria. A first significant set has those people who were associated with the rocket activities at Peenemünde and who later worked for the U.S. Army in Huntsville sometime in the period 1950–1960. During these Huntsville years, these individuals led the development of the Redstone, Jupiter, Pershing and other rockets, using the knowledge and experience they acquired at Peenemünde.

However, it is probably more significant that this set mentored a very much larger group of new Army employees – mostly U.S. born citizens, but including some immigrants. The Redstone and Jupiter programs were excellent opportunities for these newcomers to gain experience with the many rocketry disciplines needed for the successful development of a new rocket system. It is important that they gained this experience under the mentoring of the already experienced rocketry team from Peenemünde. It is therefore appropriate to designate the set of individuals who came from Peenemünde to the Army organizations as the “Rocketry Mentors”, Fig. 1.

The systematic mentoring by the Peenemünde alumni has been recounted by various authors who were the recipients of the mentoring. Perhaps the most informative account of mentoring is by Charles L. Bradshaw in his book, Rockets, Reactors and Computers Define the 20th Century [3]. In 1951, he was an early new-hire by the Army Guided Missile Development Division at Redstone Arsenal, adjacent to Huntsville. He describes rather intense mentoring, during his first few weeks of employment, by Dr. Hans Friedrich, who had been a university professor in Germany. Later, Bradshaw was tutored by Dr. Adolf Thiel.

Dr. Sherman Seltzer gives another example of mentoring in a communication to the daughter of Fritz Weber quoted in a communication from her to the Archives [4]. He writes (condensed) “I came to the Army Ballistic Missile Agency upon finishing my graduate work at the U of Michigan. I was still in the Army then. When I arrived at ABMA I was assigned to the ABMA Project Office as the ‘Senior Pershing Project Officer’. Because my academic training had been in guidance and control, I made a bee-line to Dr. Haeussermann's Guidance & Control Lab. He introduced me to Fritz Weber, who was the Pershing Project Leader for the Lab. Fritz took me under his wing and introduced me to the Pershing G & C system. … As time went on, Fritz introduced me to all the wonderful members of the G & C Lab. This helped shape my whole engineering career.”

Other Army employees from the 1950–1960 Army period, in their oral history video interviews, have acknowledged being mentored by their former German colleagues. Returning to Bradshaw's text, he summarizes the mentoring with the statement “Dr. von Braun had established the procedure