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- Technological Innovation  
and Transnational Networks:  
Europe between the Wars



Alexander C. T. Geppert

Space *Personae*:

## Cosmopolitan Networks of Peripheral Knowledge, 1927–1957

«Planetarier aller Länder, vereinigt Euch!»

*Berlin Radio Broadcast, ca. Summer 1930*

For much of the twentieth century, outer space has constituted one of the major sites of utopian thinking. From the aftermath of the Second World War through to the mid-1970s, it was a popular assumption in the United States and in Europe that the future was destined to take place in outer space. In a few years, experts agreed, gigantic space mirrors, nuclear wonder weapons and constantly-manned space bases would be stationed in the near-earth orbit while the permanent colonisation of first the Moon and later Mars seemed merely a question of time. Humankind's steady development towards a genuine <three-dimensional civilization> (Krafft A. Ehrlicke) appeared as an inevitable, yet welcome consequence of the continual progress of science and technology.<sup>1</sup>

Always lurking behind any of these enterprises was a much older question of fundamental importance, which, if answered affirmatively, would literally revolutionise the human condition: would it be possible to prove the existence of extraterrestrial intelligence by, for instance, finding an artifact left in our solar system or even by establishing direct contact?<sup>2</sup> Far-fetched only at first thought and unanswered to the present day, the question has nonetheless had very real socio-cultural effects. The number of attempts to deploy technical devices to establish contact has been vast. <Here men from the planet Earth first set foot upon the Moon, July 1969, A. D. We came in peace for all mankind> can still be read on the

<sup>1</sup> W. Ley, «The End of the Rocket Society», in: *ASTOUNDING Science-Fiction* 31/32 (August/September 1943), 64–78, 58–75, here pt. II, 58. C. Penley, *NASA/Trek. Popular Science and Sex in America* (New York, 1997), 22. Sincere thanks are due to David Blackburn, Dorothee Dehnicke, Rita Hortmann, Heinz Hermann Koelle, Bruce Mazlish,

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lunar plaque bequeathed by the Apollo 11 mission at *Mare tranquillitatis*. Likewise, the most remote human-made object in the cosmos, the *Voyager 1* spacecraft, carries carefully composed messages intended for an unknown but certainly not human audience.<sup>2</sup>

## 1. Science, Fiction and the Rise of the Space Expert

How exactly did European Astrofuturism develop into a central element of the project of Western modernity?<sup>3</sup> Who were the key protagonists, leading figures and early advocates who together formed the spaceflight movement in interwar Europe? In what way did they establish their authority, expertise and respectability *vis-à-vis* the general public and the pre-existing scientific communities? These questions of agency need to be addressed more directly than hitherto the case when historicising the societal impact of outer space in general and the European space effort in particular. The present article looks at a number of cases in Germany and Great Britain and, to a lesser extent, France, Austria and the United States. It concentrates on the period between the establishment of one of the world's first amateur societies exclusively devoted to the cause of spaceflight, the German *Verein für Raumschiffahrt*, in June 1927, and the launching of Sputnik I, the first artificial satellite, thirty years later. Thus, the focus of this article is restricted to the West, particularly Europe. The various Russian societies are not explicitly treated because they received far less attention. Cooperation with the West was limited even before Stalin began to eliminate all international contacts in the early 1930s, thus cutting the Russian groups off and shrouding their activities in secrecy for decades to come, certainly until Sputnik.

«The true birth of the Space Age [...] may be said to have begun», Smithsonian curator Frank H. Winter has argued, «when applied science entered the picture in the 1920s and 1930s.» «Rocketry and astronomical societies represented the core of the international astronomical movement [...] and helped lay the groundwork for the true beginnings of what may be called «modern astronautics.»<sup>4</sup> While the late 1920s and early 1930s were certainly the formative phase within this thirty-year period, the entire pre-Sputnik I history is frequently referred to as the «pioneering» or «visionary» era of spaceflight, at times quite naively. However, there is no rectilinear development from «fiction» to «science». «Science fiction» and «science fact» overlap and continue to affect each other.

2 C. Sagan et al., eds., *Murmurs of Earth. The Voyager Interstellar Record* (New York, 1978).

3 This term was first introduced by the American literary scholar De Witt Douglas Kilgore (idem, *Astrofuturism. Science, Race, and Visions of Utopia in Space* (Philadelphia, 2003)). Here, it is understood as a specific variant and sub-category of Astroculture, in itself a conceptual counterpart to

the more familiar notion of Astropolitics. An alternative option would be «E.T. culture», developed by anthropologist Debbara Battaglia (idem, ed., *E.T. Culture. Anthropology in Outerspaces* (Durham/NC, 2006)).

4 F. H. Winter, *Prelude to the Space Age. The Rocket Societies, 1924–1940* (Washington/D.C., 1983), 13.

Yet, the one has never been fully absorbed by the other. Carefully distinguishing between <science> and <fiction> in the first place, we must ask whether it is their different epistemologies or, rather, orientation to diverging modes of narrativity that configures the pivotal difference. A second factor further complicates any retrospective assessment of the early spaceflight movement: In the interim, at least some of these <engineers' dreams> have come true.<sup>5</sup> Over the years, members of the space community have taken great pains to historicise themselves. Nevertheless, writing their history as a simplistic success story *à la* <from imagination to reality> is to homogenise a far more complex historical development, leading one too easily to endorsing the type of facile master narrative that professional historiographical scholarship above all seeks to avoid.

The present article focuses on the international and, almost literally, cosmopolitan character of the early spaceflight movement. It suggests that transnational personal contacts among rocket enthusiasts and space engineers *avant la lettre* went hand in hand and often preceded the establishment and proliferation of amateur societies in Western Europe, thus emulating a much older model successfully developed by scientists since the seventeenth century. Intensive individual cooperation existed before the respective exchange fora were created, established and eventually institutionalised. The Second World War was a significant catalyst as it simultaneously disrupted and accelerated this process of internationalisation. In Germany, at least, it meant the end to an already widely dispersed movement and led to a complete transformation of its protagonists' public standing. While the amateur clubs had already become internationalised by the early 1930s, it was not until the early 1950s that a persistent public demand for their especial kind of peripheral knowledge developed. Only then were their expertise and authority widely acknowledged by the general public. Consequently, the activists' social status rose from being perceived as <a bunch of crackpots>, <deviant> outsiders and marginal men to that of widely accepted specialists and space experts. In the process, they also laid the foundation of the <rocket scientist>-myth in popular culture, itself a prototypical figure emblematic of 1960s and 1970s techno-scientific modernity, even though most of them were engineers by training, not scientists. Yet, as they moved from the margins to the center of society, protagonists of the spaceflight movement had to pay a high price. Once activities were resumed after the war, intellectual streamlining was a necessary precondition in order to attain wider societal acceptance, a process ultimately detrimental to the movement's long-term development and one which finally led to its being absorbed by state- and industry-sponsored enterprises.<sup>6</sup>

5 W. Ley, *Engineers' Dreams* (New York, 1959).

6 C. Gibbs-Smith, «By Rocket to the Moon?», *The Listener* (3.02.1949), 175f.

Heuristically, this article operates with the rarely employed concept of *persona*, originally developed by social theorists as diverse as C. G. Jung and Marcel Mauss, and only recently rediscovered by anthropologists and historians of science interested in the creation of a particular scientific type of person.<sup>7</sup> The *persona* is best described as a supra-individual type, a particular figure intermediate between the individual biography and the social institution, presupposing a certain degree of socio-cultural recognition. Criticised by some as being necessarily vague and somewhat idiosyncratic, the concept is applied here pragmatically, not the least as a possible alternative to the often overused and frequently under-theorised notion of collective or group identity. It serves as a tool to find a common denominator for an otherwise heterogenous social body, to analyse the making, composition and self-understanding of a comparatively small lobby group and to study the forging of a professional, subjective expert mentality among historical actors by adopting a specific <Gestus> from other, sometimes competing research organisations. Thus, its epistemological interest differs greatly from what classical professionalisation theories seek to explain. In the present context, the aforementioned curator Frank H. Winter was the first to observe and emphasise the importance of individuals and their personalities in what he characterised as the <subtle creation of a sort of prespace age space «lobby»>, referring to their <imagination> as the only common denominator and motive for investing enormous human resources in the cause of spaceflight.<sup>8</sup> Yet, while <personality> seems a rather weak historiographical category, intention and motivation are all the more difficult to analyse in retrospect. As an alternative, the present article suggests comprehending these processes as one of the formation of a particular type of space *persona* that would eventually give rise to the still familiar figure of the <rocket scientist>.

To establish such an argument, the article proceeds in three steps: First, it sketches the formation of various national rocket societies and briefly characterises some of their key protagonists, in particular the German-American space travel expert and populariser Willy Ley (1906–1969) and the legendary British science fiction author Arthur C. Clarke (1917–2008). Having recently passed away, Clarke was not only the renowned author of *2001: A Space Odyssey* (1968) but also served as Chairman of the influential *British Interplanetary Society* for several decisive years. Second, the article follows their attempts at expanding transnational

7 C. G. Jung, Die Persona als ein Ausschnitt aus der Kollektivpsyche, in *Die Beziehungen zwischen dem Ich und dem Unbewussten* (Zurich, 1933), 171–188; M. Mauss, «Une catégorie de l'esprit humain. La notion de personne, celle de «moi»», in: *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 68 (July-December 1938), 263–281; R. Blomeyer, «Aspekte der Persona», *Zeitschrift für Analytische Psychologie* 5 (1974), 17–29; C. Matta-

lucci, «Persona, self, emozioni. Antropologia e individualità», *La ricerca folklorica* 35 (April 1997), 81–91; L. Daston and H. O. Sibum, «Scientific Personae and Their Histories», *Science in Context* 16 (March 2003) 1/2, 1–8. Quite surprisingly, Daston and Sibum do not even mention Jung in passing although he coined the term half a decade prior to Mauss.

8 Winter, *Prelude*, 15f.

contacts and cooperation before and after the Second World War, thus establishing and institutionalising a <space international>. Third, it examines the movement's concerted activities in relation to the public's renewed post-war enthusiasm for space matters long *before* Sputnik and its decreasing significance prior to the foundation of large state-sponsored research programmes in Western Europe and the United States. In so doing, this article contributes to a long overdue historicisation of the European space effort, its societal impact and imaginative dimension in the broadest sense, thus helping to move beyond Space History's self-imposed <splendid isolation> and to integrate it more closely into mainstream social and cultural historiography.<sup>9</sup>

## 2. Rocket Men: Amateur Clubs in Interwar Europe

Ironically, the history of the early spaceflight movement was indeed one of <great men>, even if they were not necessarily recognised as such at the time. In a brilliant sociological study, William Sims Bainbridge has estimated that there were only some 100 exclusively male protagonists of very different backgrounds and education, <rocket scientists> *avant la lettre*, who played significant roles in spaceflight development prior to the establishment of military missile programmes.<sup>10</sup> Beginning with the legendary *Verein für Raumschiffahrt* (VfR) in June 1927, space travel enthusiasts formed amateur societies not only in Germany but also in the United States, Great Britain and the Soviet Union. The *American Interplanetary Society* (later renamed the *American Rocket Society*) was founded in April 1930, the *British Interplanetary Society* (BIS) three and a half years later, in October 1933. Even smaller, less active groups formed in Austria in connection with engineers Franz von Hoefft (1882–1954) and Guido von Pirquet (1880–1966), and in France under Robert Esnault-Pelterie (1881–1957) and later Alexandre Ananoff (1910–1992). Ananoff was a writer, Esnault-Pelterie an engineer and early aviator who is said to have coined, if not created, the term <astronautics> in 1930.<sup>11</sup> In both cases, small predecessor groups had already established themselves before the Second World War, i.e., in 1926 and 1928, respectively. But the equivalent national societies were only formed after the war, the *Österreichische Gesellschaft für Weltraumforschung* in 1949 and the *Groupement Astronautique Français* in 1947.

9 W. A. McDougall, *...The Heavens and the Earth. A Political History of the Space Age* (New York, 1986); H. E. McCurdy, *Space and the American Imagination* (Washington/D.C., 1999); H. Trischler and K.-U. Schrogl, eds., *Ein Jahrhundert im Flug. Luft- und Raumfahrtforschung in Deutschland 1907–2007* (Frankfurt am Main, 2007); A. C. T. Geppert, «Flights of Fancy. Outer Space and the European Imagination, 1923–1969», in *Societal Impact of Spaceflight*, eds. S. J. Dick and R. D. Launius (Washington/D.C., 2007), 585–599.

10 W. S. Bainbridge, *The Spaceflight Revolution* (New York, 1976), here 36, 128.

11 R. Esnault-Pelterie, *L'Astronautique* (Paris, 1930). Other sources credit the term to the French writer of adventure stories and science fiction J.-H. Rosny, a pseudonym of two brothers best known for their prehistoric novel *La Guerre du feu. Roman des âges farouches* (Paris, 1911).

While the actual contexts of origin, social composition and religious background of their members differed widely, these groups shared a common belief in the same objective: to build a spaceship, to undertake extraterrestrial voyage and eventually to colonise other planets. <The ultimate aim of the Society, of course, is the conquest of space and thence interplanetary travel>, Philip Ellaby Cleator (1908–1994), founder and first President of the BIS, declared in January 1934. Independently, Ley and Esnault-Pelterie made almost identical statements. To achieve such an ambitious objective, the European societies initially set themselves two more manageable tasks. First, they considered a certain amount of publicity, propaganda and concerted media activities indispensable <to spread the idea of space travel and to prove that no natural law opposed this idea.> Second, they aimed to undertake practical technical work, the VfR more so than the BIS, thus effectively making Germany <the hub of all rocket experimentation.><sup>12</sup>

The *Raketenverein* – as the VfR became to be called – was founded by space enthusiast and church administrator Johannes Winkler (1897–1947) and popular writer Max Valier (1895–1930) in June 1927. Soon they were joined by scientist Hermann Oberth (1894–1989), school teacher and author of the seminal study *Die Rakete zu den Planetenräumen*, sometimes hailed a father figure and later to become the Society's President, and young Willy Ley, shortly its Vice-President and Secretary. Oberth was a flamboyant, yet quarrelsome personality whose later, somewhat unconventional work would never again achieve the same impact as his first two book publications. Other influential members included renowned science-fiction author Otto Willi Gail (1896–1925), Essen-based engineer Walter Hohmann (1880–1945) and a young university student by the name of Wernher von Braun, soon to become Oberth's chief protégé. Experimental work was intensified after the VfR's headquarters were moved from Breslau to the German capital and, in particular, after the opening of the legendary *Raketenflugplatz* on September 27, 1930 under the auspices of another engineer, Rudolf Nebel (1894–1978).<sup>13</sup>

<sup>12</sup> P. E. Cleator, «Retrospect and Prospect», *Journal of the British Interplanetary Society* [hereafter *JBIS*] 1 (1934) 1, 2–4, here 3; idem, «Die Raketenbewegung in England», *Das neue Fahrzeug. Mitteilungsblatt des «E.V. Fortschrittliche Verkehrstechnik»* 1 (1934) 3, 17–19; Ley, «End of the Rocket Society», pt. I, 78f.; pt. II, 75; idem, «German Society Busy», in *Bulletin of the American Interplanetary Society* 5 (Nov.-Dec. 1930), 4: «The final goal [...] is the space ship.»; R. Esnault-Pelterie, in W. Brügel, ed., *Männer der Rakete. In Selbstdarstellungen* (Leipzig, 1933) 25; P. E. Cleator, *Rockets Through Space. The Dawn of Interplanetary Travel* (London, 1936), 148.

<sup>13</sup> H. Oberth, *Die Rakete zu den Planetenräumen*

(München, 1923), and idem, *Wege zur Raumschiffahrt* (München, 1929). Most of the early German-speaking space protagonists have been subjected to some form of biographical treatment, albeit with an enormously varying degree of quality. Cf. H. Barth, *Hermann Oberth. «Vater der Raumfahrt»* (Esslingen, 1991); B. Rauschenbach, *Hermann Oberth 1894–1989. Über die Erde hinaus* (Wiesbaden, 1995); F. Sykora, «Pioniere der Raketentechnik aus Österreich», *Blätter für Technikgeschichte* 22 (1960), 189–204; W. G. Brandecker, *Ein Leben für eine Idee. Der Raketeningenieur Max Valier* (Stuttgart, 1961); I. Essers, *Max Valier. Ein Vorkämpfer der Weltraumfahrt 1895–1930* (Düsseldorf, 1968); idem, *Max Valier. Ein* →

The site was far less glamorous than its name suggested. The *Raketensflugplatz* was in fact a huge, disused ammunition dump and former shooting range off Tegeler Weg in Reinickendorf, a Berlin suburb, with only five concrete buildings scattered over four square kilometers. Still, its sheer existence generated an enormous media stir, probably orchestrated by the ever-active Willy Ley who seems to have invented its ingenious, somewhat pretentious name in several identical articles simultaneously published in various Berlin newspapers on November 2, 1930; <With these facilities Berlin is the first European metropolis to have a research centre for this specialised area of technology which captivates the spirit of humankind and is perhaps in the future even destined to disclose planetary spaces>. Other papers soon joined in the enthusiasm. While the *Raketensflugplatz* ceased to exist in June 1934 and never had little more than a dozen otherwise unemployed handicraft enthusiasts and engineers working there, it was still the first of its kind. Twenty years later and with a global war in the interim, a newly released *Handbook of Space Flight* already listed ten similar rocket fields worldwide, seven of which were located in the United States, but remained obviously ignorant of similar Soviet facilities.<sup>14</sup>

As Figure 1 shows, notwithstanding contradictory claims and in spite of its far-reaching, almost mythical legacy, the VfR never had more than 700 paying members. Activities came to a halt in September 1933. It has been argued that the Nazis would have <killed> the German spaceflight movement, yet as a registered society, the VfR was never officially dissolved and still existed on paper as late as March 1941. Its disintegration was a two-pronged process. On the one hand, a <psychological explosion> amongst the members of the VfR together with the

*Pionier der Raumsfahrt* (Bozen, 1980); R. Guder, *Astris – zu den Sternen. Der Raketenspionier Johannes Winkler* (n.p., 2002); and, above all, the superb M. J. Neufeld, *Von Braun. Dreamer of Space, Engineer of War* (New York, 2007). See also idem, «The Excluded. Hermann Oberth and Rudolf Nebel in the Third Reich», *Quest* 5 (1996) 4, 22–27. For brief ego-documents by Oberth and other protagonists, see A. C. Clarke, ed., *The Coming of the Space Age. Famous Accounts of Man's Probing of the Universe* (New York, 1967). Rudolf Nebel's autobiography *Die Narren von Tegel. Ein Pionier der Raumsfahrt erzählt* (Düsseldorf, 1972) is rich yet self-aggrandising. See also H. H. Koelle, *Werden und Wirken eines deutsch-amerikanischen Raumfahrt-Professors* (Berlin, 1994).

<sup>14</sup> See, for instance, [W. Ley], «Raketensflugplatz Berlin! In Reinickendorf-West», *Berliner Tageblatt* (2. 11. 1930), 1. Beiblatt (MA) and «Raketen-Flugplatz Berlin in Reinickendorf-West, am Tegeler Weg», *Berliner Volkszeitung* (2. 11. 1930), 7 (MA);

«Der erste Raketensflugplatz der Welt», *ibid.* (4. 11. 1930), 1 (AA); «Der Raketensflugplatz des Vereins für Raumschiffahrt», *Luft- und Kraftfahrt* (15. 02. 1931), here 1; Ingenieur Küttner, «Richtung Mond! – Bitte einsteigen! Ein Besuch auf dem Raketensflugplatz Berlin», *Wissen und Fortschritt* 5 (1931) 4, 49–53; «Raketen-Flugplatz Berlin», *Berliner Tageblatt* (20. 01. 1931); «Mond-Rakete wird gebaut!», *Berliner Volkszeitung* (26. 02. 1932), 7 (MA). W. A. Proell and N. J. Bowman, *A Handbook of Space Flight* (Chicago, 1950), 165. These ten rocket fields were: White Sands, NM; Fort Bliss, TX; Aerojet Corporation, Azusa, CA; Reaction Motors, NJ; Inyokern, CA; Florida, Banana River to Bermuda Islands; US Naval Rocket Test Station, Dover, NJ; Peenemünde, Germany; Bleicherode, Harz, Germany; Woomera, Australia. Meanwhile, Peenemünde and Bleicherode had obviously gone out of business.



economic crisis of 1929 had led to a serious drop in numbers and hence in available revenues. Nebel, its newly elected president, did not manage to stop the group's disintegration, and it collapsed due to internal conflicts. Simultaneously, however pressure on the part of the *Reichswehr*, especially on the *Raketenflugplatz*, increased together with the growing interest of the former in liquid-fuel rocketry, and the latter was raided in June 1934. The subsequent suppression of all public rocket activities included the censorship of technical publications.<sup>15</sup> The Society having fallen apart and the military taking over all experimental work, rocket development in Germany was no longer a private matter by 1934. Several smaller, short-lived succeeding organisations such as the *E.V. Fortschrittliche Verkehrstechnik* (1934–1940), founded by engineer Otto Steinitz (1885–?), and the *Gesellschaft für Weltraumforschung e.V.* (GfW; 1937–1942), first based in Breslau, then in Berlin and presided over by physicist Hans K. Kaiser (1911–1985) and rocket-propulsion engineer Krafft A. Ehricke (1917–1984) were created in the Third Reich but never attained the same prestige. Membership was restricted to persons with technical and professional expertise. Their attempts at popularising space travel were less audaciously formulated and proved far less effective, not the least because these groups lacked similar *personae* compared to those of the VfR.<sup>16</sup>

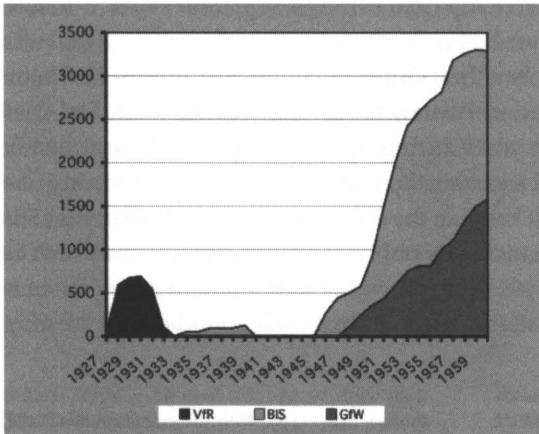


Fig. 1: Membership Statistics of the Verein für Raumschiffahrt (VfR), the British Interplanetary Society (BIS) and the Gesellschaft für Weltraumforschung (GfW), 1927–1960<sup>17</sup>

15 M. J. Neufeld, *The Rocket and the Reich. Peenemünde and the Coming of the Ballistic Missile Era* (New York, 1995), 13–32.

16 See correspondence between Rudolf Nebel, Amtsgericht Berlin N 65 and Polizeipräsident Berlin, Landesarchiv Berlin, A Pr.Br.Rep. 030 Tit. 148 2239, for instance the cover letter dated 7.03.1941 [hereafter LAB]. The statutes of the *Gesellschaft für Weltraumforschung e.V.* can be found *ibid.*, A Pr.Br.Rep. 030–04 2844. W. Ley, «The Story of European Rocketry», *Astronautics. Journal of the*

*American Rocket Society* 32 (Oct. 1935), 5–9, 18; *ibid.*, «How it all Began. An Authority Recalls the Early Days of the Space Age», *Space World* (June 1961), 23–53; *ibid.*, «End of the Rocket Society», pt. II, 63; H. K. Kaiser, «The Spirit of Astronautics in Germany in the last 15 Years», *JBIS* 8 (March 1949) 2, 45–51; H. H. Koelle, «Astronautical Activities in Germany», in: *ibid.* 14 (May/June 1955) 3, 121–131.

17 Information in this graph is compiled from a variety of sources including *Die Rakete. Offizielles* →

By comparison, the pre-war BIS was an even smaller organisation, established at a time when the VfR had *de facto* but not *de jure* ceased to exist and the German space movement was marginalised. Even if members insisted that it was ‘not destined to become the British VfR’, the BIS took over its work in many ways and became, especially after the Second World War, of equal significance. Founded on October 13, 1933 at the house of Philip Ellaby Cleator, a 25-year-old engineering contractor from Liverpool and its first President until headquarters were moved to the capital in 1937. The task of making England interplanetary minded was begun, Cleator was later to comment. Any potential ambitions towards undertaking practical work, however, were thwarted by the Explosives Act of 1875, which had forbidden private testing of liquid-fuel rockets in the United Kingdom. Later attempts to begin experimenting on the part of a specifically established committee failed because of lack of both funding and experience. Another committee focused on developing several instruments such as a coelostat and designing a moonship. Early influential BIS members included not only Cleator and Clarke, but also aeronautical engineer Arthur Valentine ‘Val’ Cleaver (1917–1977) and, of special interest, ‘Professor’ Archibald Montgomery Low (1888–1956). Author, prolific inventor and a man of some professional standing even if technically not a professor, Low had been introduced to Cleator by Willy Ley and acted as the Society’s President from early 1936 through September 1951.<sup>18</sup> Before the Second World War, the BIS never had more than 100 members [Fig. 1] and was by no means the only British society either. Other, small pre-war groups had been formed independently in Manchester, Paisley, Leeds and Hastings. All activities were suspended for more than five years during the war but promptly resumed in December 1945. The various small societies then joined the BIS, thus forming one new, combined national society but keeping the old name. It was only then that *The Times* began to take notice by announcing its public meetings and activities such as a screening of five captured German films on rocket development at the Science Museum, South Kensington, in March 1947. Its post-war membership of 269,

*Organ des Vereins für Raumschiffahrt e.V. in Deutschland* (1927–1929), *Raketentflug. Mitteilungsblatt des Raketentflugplatzes Berlin* (1932–1934); K. Rohrwild, «Verein für Raumschiffahrt (VfR). Chronik eines Vereins», 5. *Tag der Raumfahrtgeschichte*, ed. idem (Feucht, 2001); *Journal/Annual Report of the British Interplanetary Society* (1934–1960); *The Times* (1934–1960); personal communication with Bob Parkinson, BIS, 8.05.2008. No statistical difference is made between Honorary Fellows, Fellows and ordinary BIS members. «Die Entwicklung der GfW/DGRR in Zahlen», Deutsches Technikmuseum Berlin/Historisches Archiv, 1.3.008VV, 2/07 [herafter DTM/HA].

(May 1950) 3, 93–101, here 98; Cleator, *Rockets through Space*, 139. With the exception of Clarke, reliable biographical information on the early British space cadets is difficult to find. But see «Mr A. V. Cleaver», *The Times* (21.09.1977), 16; «Mr A. M. Low. Popular Science», *ibid.* (14.09.1956), 11; and U. Bloom, *He Lit the Lamp. A Biography of Professor A. M. Low* (London, 1958), 178–189. Only the very last volume of S. Thomas’s voluminous series *Men of Space. Profiles of the Leaders in Space Research, Development, and Exploration* (8 vols., Philadelphia, 1960–1968) is devoted to the «international space scene» – meaning Europe – and offers sketchy excerpts from conversations with Clarke (14–16) and Cleaver (16–20).

<sup>18</sup> H. E. Ross, «Gone with the Efflux». *JBIS* 9

already twice as much as in 1939, would multiply tenfold during the next ten years, making the BIS eventually one of the world's largest space flight societies.<sup>19</sup>

To reach a wider audience beyond these narrow circles, both societies followed the same strategy. From the outset, they published a professionally designed journal, complete with illustrations, for existing members and to attract prospective ones. The VfR's monthly bulletin, *Die Rakete: Offizielles Organ des Vereins für Raumschiffahrt E.V.*, published for the first time in June 1927, brought forth a wide variety of scientific articles, opinion pieces and futuristic short stories about the conquest of space, mostly written by its members. After three years, publication had to stop due to financial constraints; the limited resources available were redirected toward experimental work instead. *Die Rakete* was replaced by a host of far less lavish, self-typed newsletters that in turn precipitated the withdrawal of several hundred members. The BIS emulated this model but without repeating the same mistake. «With the loss of the Journal», Cleator realised, members of the VfR had been «deprived of their only real link with the Society.» At its very first assembly, with only the six founding members present, the creation of the *Journal of the British Interplanetary Society (JBIS)* had already been decided upon, and the first issue appeared in January 1934. The articles' themes and topics were not unlike those of *Die Rakete*, save for three decisive differences. First, the early issues featured fewer illustrations. Second, the scope of themes treated was wider, allowing space to articles ranging from rocketry and science to interplanetary communication, interstellar «philosophy» and questions of extraterrestrial life. Third, the journal was international from the beginning. Following a long dispute among members over a strictly scientific versus a more popular orientation, an additional publication, *Spaceflight*, was created in October 1956, directed towards the general reader.<sup>20</sup>

In their twin-track attempts to convince the public of their cause and to undertake preliminary experimental work, thus establishing the field and their authority alike, both societies were aided by the timely advent of popular films, in

19 *The Times* (5.10.1946), 5; *ibid.*, (15.03.1947), 5; «Interplanetary Society's Coming of Age», *ibid.* (16.10.1954), 8; P. E. Cleator, «Matters of No Moment», *JBIS* 9 (March 1950) 2, 49–53; M. F. Allward et al., «Astronautics in Britain», *Spaceflight* 9 (May/June/July/August/September 1967) 5/6/7/8/9, 150–152, 201–206, 234–236, 264–267, 299–304, here 234f.; H. E. Ross, «The British Interplanetary Society's Astronautical Studies, 1937–39», in *First Steps toward Space*, ed. F. C. Durant III. and G. S. James (Washington/ D.C., 1968), 209–216.

20 *Die Rakete. Zeitschrift des Vereins für Raumschiffahrt e.V.* (1927–1929); *Mitteilungen des Vereins für*

*Raumschiffahrt e.V.* (1930ff.); *Raketenflug. Mitteilungsblatt des Raketenflugplatzes Berlin* (1932–1934); *Das Neue Fahrzeug. Mitteilungsblatt des «E.V. Fortschrittliche Verkehrstechnik»* (1933–1937); *Weltraum. Mitteilungsblatt der Gesellschaft für Weltraumforschung* (1939–1942); *Weltraumfahrt. Zeitschrift für Astronautik und Raketentechnik. Offizielles Organ der Gesellschaft für Weltraumforschung e.V., Stuttgart* (1950–1966); *Journal of the British Interplanetary Society* (1934–); *Spaceflight* (1956–). Cf. P. E. Cleator, «Editorial», *JBIS* 1 (April 1934) 2, 13–15, here 13, and «The History of B.I.S. Publications», *ibid.* 8 (May 1949) 3, 117f.

Courtesy National Air and Space Museum, Smithsonian Institution. SI 2006-26085



Fig. 2: Otto Kanturek, Hermann Oberth, Gustl Gstettenbaur, Fritz Lang, Willy Fritsch, Hermann Ganswindt and Willy Ley on the set of *Frau im Mond*. UFA Studios Berlin-Neubabelsberg, August 1929.

the case of the VfR, Fritz Lang's last silent film *Frau im Mond* (UFA 1929); in the case of the BIS, the rather ominous science fiction film *Things to Come* (1936), based on H. G. Wells' novel of the same title. Both films featured a spaceship as a futuristic, yet realisable symbol for human progress. While far too rich to be fully exploited here, the earlier and more significant of the two, the melodrama *Frau im Mond*, is especially noteworthy for its close, multiply entangled collaboration between <fiction> and <science>. Lang employed scientist Oberth and publicist Ley as counselors. Figure 2 shows these <space cadets> and VfR members standing on the set in Berlin-Neubabelsberg together with Lang himself and some of the actors. In turn, UFA, the production company, agreed to finance experiments and supported Oberth with a view to developing a fully functional <Propagandarakete> to promote the film. Hence, fiction preceded science – which then in turn affected fiction. Although Oberth did not manage to complete his part of the deal, the film still premiered on October 15, 1929 at UFA-Palast am Zoo, attended by such eminent persons as the American ambassador, Alfred Hugenberg and Albert Einstein. Soon after, it was also released in Great Britain and the United States. *Frau im Mond*, historian Michael J. Neufeld has judged, <was not the first spaceflight movie, but it was certainly the first significant and technologically plausible one.><sup>21</sup>

21 H. Wollenberg, «Frau im Mond», *Film-Kurier* (16.10.1929); R. Arnheim, «Die Frau im Mond».

*Die Weltbühne* 25 (22.10.1929) 43, 629–631; «New German Film. A Journey to the Moon».

But above all, with this film an imagery of outer space was established and made a genre of the visual arts which was *ab initio* characterised by manifold and complex transgressions between science and fiction.

The same can be said with regard to the creation of the space *persona*. There was a strong element of both self-stylisation and self-historicisation in the protagonists' accounts, with Ley soon transforming into not only the cause's main populariser but also the movement's unofficial annalist. In his many, partly overlapping historical accounts, Ley usually reconstructed the development of rocketry and <space travel thought> going back to ancient China. Other practitioners, however, frequently emphasised the absolute novelty of their activities, interpreting their cause simultaneously as a radical break with the past and a far-reaching, Pascalian promise for the future. <The idea of interplanetary travel is revolutionary, and, until recently, unheard of>, Cleator proclaimed somewhat pompously when the BIS was barely a few months old.<sup>22</sup> Both contemporaneously and in retrospect, members often referred to themselves or their colleagues in this scientific field under construction as <pioneers>, <prophets>, <visionaries> or simply as <Männer der Rakete> – rocket men. Under this title, young journalist Werner Brügel (1915–1998) published in 1933, six years after the establishment of the VfR, the first collection of 13 autobiographical sketches by the <most distinguished rocket researchers> from five different countries, including Hermann Oberth, Johannes Winkler and Willy Ley from Germany, Robert Esnault-Pelterie from France, and Franz von Hoeffft and Guido von Pirquet from Austria. The book's futuristic cover, in vivid blue, white and orange, featured a stylish streamlined rocket halfway between the globe and the moon, with its programmatic title <Männer der Rakete> superimposed on the slim vehicle's obvious goal [Fig. 3].<sup>23</sup> Similarly, *Die Rakete* regularly featured brief biographical articles on space enthusiasts, dead or alive, and the BIS's journal ran a column *Know Your Council*, later to

*The Times* (25.10.1929), 12; P. Dubro, «Frau im Mond, Fritz Lang und ein Interview», *Film-Illustrierte* 44 (30.10.1929), 864f.; W. Ley, «Die Kosmopiloten», *Reichsfilmblatt* 41 (12.10.1929), 13. M. J. Neufeld, «Weimar Culture and Futuristic Technology. The Rocketry and Spaceflight Fad in Germany, 1923–1933», *Technology and Culture* 31 (1990) 4, 725–752, here 740. There is no thorough, entirely satisfying historical analysis of *Frau im Mond*, but see R. Eisfeld's epilogue «Frau im Mond. Technische Vision und psychologisches Zeitbild», T. von Harbou, *Frau im Mond* [1928], ed. R. Eisfeld (München, 1989), 207–237; G. Geser, *Fritz Lang. Metropolis und Die Frau im Mond. Zukunftsfilm und Zukunftstechnik in der Stabilisierungszeit der Weimarer Republik* (Meitingen, 1996); F. Beyer, «Die Erfindung des Countdowns», *Frank-*

*furter Allgemeine Zeitung* (14.10.2004), 37. More material in National Air and Space Museum Archives, Smithsonian Institution, Washington, D.C., Willy Ley Collection, 30/4 [hereafter NASM/WLC].

22 W. Ley, *Rockets, Missiles, and Space Travel* (New York-London, 1952/1957), 4, 50f.; idem, «Die Geschichte des Raumfahrtgedankens», in *Handbuch der Astronautik*, ed. K. Schütte and H. K. Kaiser (Konstanz, 1958), 1–28; Cleator, «Retrospect and Prospect», 3f.

23 U. Andres, «Men of Space», in: *New Outlook* 164 (October 1934) 4, 26–33; Brügel, *Männer der Rakete*; postcard Werner Brügel to Walter Hohmann, 17.11.1932, Erfatal-Museum Hardheim, exhibit W 9.7/9.8.

be replaced by a series called *Profiles*. It is striking how meticulously protagonists of the early spaceflight movement tried to first shape and then control their public image as space *personae*, and how effectively they managed to establish a widely shared genealogical canon of ‹space pioneers› that has defied the test of time. Up to the present day much of the existing historiography has relied heavily on the protagonists' attempts at prescribing their own history, occasionally leading to outdated forms of antiquarian hagiography.

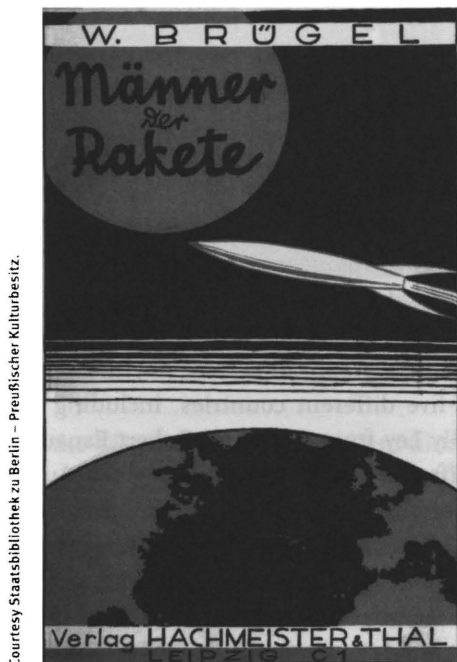


Fig. 3: Cover of Werner Brügel, ed., *Männer der Rakete. In Selbstdarstellungen* (Leipzig, 1933). Unknown Artist.

At the very centre of this ‹small circle of men whom we today call pioneers of spaceflight› stood Willy Ley, developing his transnational activities ever since he had entered the scene in 1926, at the age of twenty, with the publication of his first book, *Die Fahrt ins Weltall*, and, two years later, editing the anthology *Die Möglichkeit der Weltraumfahrt: Allgemeinverständliche Beiträge zum Raumschiffahrtsproblem*.<sup>24</sup> In 1934, a journalist described him as the ‹No. 1 man of rockets in Europe› – an informal title which he managed to keep until his death in late June 1969, a few weeks before the Apollo landing. ‹Mr. Willy Ley, who helped usher in the age of rocketry and then became perhaps its chief populariser, died yesterday›,

24 H. Gartmann, *Träumer, Forscher, Konstrukteure. Das Abenteuer der Weltraumfahrt* (Düsseldorf, 1955) (Eng. *The Men behind the Space Rockets*, New York, 1956), 11. W. Ley, *Die Fahrt ins Weltall* (Leipzig,

1926); idem, ed., *Die Möglichkeit der Weltraumfahrt. Allgemeinverständliche Beiträge zum Raumschiffahrtsproblem* (Leipzig, 1928).

began his obituary in the London *Times*.<sup>25</sup> For reasons that are not entirely clear – rumor has it that he was *Vierteljude*, other sources list him as Lutheran, according to a third opinion he had got into difficulties with the Gestapo for not ceasing to write space articles in foreign journals, others again claim that he felt simply restricted in what he could publish on rocketry under Nazi rule – Ley emigrated in 1935 to New York via London, disguising his effectively long-prepared escape as a journalistic trip. Once arrived in the United States, Ley established himself as a leading authority on *Rockets, Missiles, and Space Travel*, thus the title of the comprehensive, self-historicising textbook, which he kept revising in subsequent editions from 1944 through 1968. «Rocket experts do not exist as yet», Ley himself had stated in the same year in which he left Berlin, and then continued during the following decades to transform himself into precisely that, thereby effectively forming both the field and, at least in the public's eye, contributing to the creation of the figure of the «space» or «rocket scientist».<sup>26</sup> Thus, Ley came to symbolise the permeability of alliance boundaries during the Cold War and the yearning to leave Earth's gravitational forces behind. Not at all a classical scientist at the top of his field but rather a zoologist by training and freelance journalist for most of his life, Ley enjoyed renown because his dreams of movement beyond earthly boundaries turned him into the prototypical space *persona* and cosmopolitan celebrity.

The BIS, by comparison, lacked such a single, central networker. In 1936 – the same year in which the film *Things to Come* was released – Cleator published the first British popular book on the subject, *Rockets through Space: The Dawn on Interplanetary Travel*. The first account authored by a British protagonist intended to historicise their efforts, yet the author's influence on the Society he had founded was already diminishing. As a result of internal conflicts, Cleator resigned from his position, and soon after a newly-formed London branch took over and named «Professor» Low President, not least in order to increase the Society's scientific respectability and public standing. However, in terms of media activities, long-time efficacy and widespread popularity, an equivalent to Ley can be found in the person of Arthur C. Clarke. Having joined the Society in 1934 before its move to London, Clarke became first Treasurer and then, after the war, Chairman in 1946/1947 and from 1950 through 1953. In this capacity, Clarke not only invited

25 Andres, «Men of Space», 28; «Mr Willy Ley. Popularizer of Space Travel», *The Times* (26.06.1969), 10. In 1950, *Der Spiegel* had described him as «a naturalised American, himself a rocket pioneer and probably the most financially successful author dealing with rocketry [naturalisierter Amerikaner, selbst Raketenpionier und wahrscheinlich bestverdienender Raketenautor]», with reference to Ley's numerous publications and public

appearances. Cf. «In fünf Jahren zum Mond», *Der Spiegel* (29.06.1950) 26, 26–30, here 30.

26 Ley, *Rockets, Missiles, and Space Travel*; starring in 1944 as *Rockets* and evolving into *Rockets and Space Travel* (1947) and *Rockets, Missiles, and Space Travel* (1951), the last edition of this comprehensive textbook was entitled *Rockets, Missiles, and Men in Space* (1968). Idem, «The Story of European Rocketry», 6.

British philosopher and renowned science fiction author Olaf Stapledon (1886–1950) to deliver his seminal lecture ‘Interplanetary Man’ but also began to author brochures, propaganda material and articles for the Society’s journal. Having just published his legendary paper on ‘extra-terrestrial relays’ – which, in 1945, effectively laid down the concept of geosynchronous-orbit communication satellites – Clarke began to treat a wide array of topics in his contributions. Subject matters in the late 1940s and early 1950s alone ranged from ‘Electronics and Space-Flight’ and ‘Astronautics and its Impact upon Human Society’ to ‘Astro-nautics and Poetry’ and ‘Space-Travel in Fact and Fiction’. In the early 1950s Clarke also critically reviewed George Pál’s 1951 Hollywood movie *When Worlds Collide* and repeatedly commented on the first cross-border and indeed transnational wave of UFO sightings to be seen in the European skies in the decade between 1947 and Sputnik.<sup>27</sup>

Yet, the ever-active Clarke proved – and remained – the exception to the rule. In comparison to the *Gesellschaft für Weltraumforschung*, the largest and most important, yet only one of several small German societies formed after the Second World War, the BIS did develop and cultivate an elaborate interest in Astroculture and ‘philosophical’ aspects of space exploration, conceivably a counterreaction to the impossibility of undertaking experimental work. But there is no doubt that both societies, as they increasingly transformed themselves from small amateur clubs into professional engineering organisations, sought to win recognition within the established technoscientific community rather than remain being seen as a haven for lofty utopians and cranky fantasts. The only possibility to do so was to write fiction out of science.

### 3. Per scientiam ad astra: The Making of the Space International, 1931–1951

The pace and sustainability with which these so-called ‘space cadets’ formed contacts across borders and established transnational networks long before World War II contrasted sharply with the size of the various groups and their social standing. Ley managed to make Berlin and with it the *Raketenflugplatz* the hub

27 O. Stapledon, ‘Interplanetary Man?’, *JBIS* 7 (November 1948) 6, 213–233; A. C. Clarke, ‘Extra-Terrestrial Relays. Can Rocket Stations Give World-wide Radio Coverage?’, *Wireless World* 51 (October 1945) 10, 305–308; ‘The Challenge of the Space-ship (Astronautics and its Impact upon Human Society)’, *ibid.* 6 (December 1946) 3, 66–81; ‘Astronautics and Poetry’, *ibid.* 2 (February 1947) 2, 21–44; ‘Electronics and Space-Flight’, *ibid.* 7 (March 1948) 2, 49–69; ‘Space-Travel in Fact and Fiction’, *ibid.* 9 (September 1950) 5, 213–230; ‘When Worlds Collide’, *ibid.* 11 (January 1952) 1, 1–3; ‘Flying Saucers’, *ibid.* 12 (May 1953) 3, 97–100; ‘Astronautical Fallacies’, *ibid.* 13 (No-

ember 1954) 6, 324–328. Among Clarke’s numerous publications cf. only *The Exploration of Space* (New York, 1951); *Prelude to Space* (London, 1953); *The Making of a Moon. The Story of the Earth Satellite Program* (New York, 1957); *The Promise of Space* (New York, 1968); 2001. *A Space Odyssey* (New York, 1968); *Astounding Days. A Science Fictional Autobiography* (New York, 1990) and ‘Memoirs of an Armchair Astronaut (Retired)’ [1963]; *JBIS* 46 (November 1993) 11, 411–414. See also N. McAleer, *Odyssey. The Authorised Biography of Arthur C. Clarke.* (London, 1992) which, however, appears at times more ‘authorised’ than ‘biography’.



of a newly-emerging space international, the «Mecca of all rocket enthusiasts». In April 1931, G. Edward Pendray (1923–1971), President of the recently founded *American Interplanetary Society* and one of the earliest proponents of space flight in the United States, was visiting Berlin, and Ley gave him an extended tour. Afterwards, they signed a memorandum on behalf of their respective societies, agreeing on mutual cooperation. Three months after the foundation of the BIS, Cleator followed suit: In January 1934, he flew to Berlin to confer with Ley. Together, they visited the – in Cleator’s words – «famous Raketenflugplatz» and toured the capital, with the «conversation centred round rockets and rocketry.» Moreover, Ley introduced Cleator to other prominent members of the movement and provided him with contacts in Austria, France, Russia and the United States. «Here was encouragement indeed», Cleator later reported, apparently somewhat envious of the situation in Germany:

«Here, in fact, were famous men freely devoting their valuable time to an immature foreign organisation, while our own countrymen, for the most part, had evinced not the slightest interest. Such generosity of action not only exemplified the true international nature of the scientific spirit, but it showed a sympathetic understanding, born of bitter experience, of the difficulty in raising a spark of interest in the interplanetary idea.»

This was more than simply employing the rhetoric of internationalism in science so typical of the era. Cleator, on *his* part, persuaded Ley to become a Fellow of the Society and invited him to contribute an article to its journal. By early 1931, there had already been talk of creating a supranational organisation, tentatively entitled *International Commission for Astronautics*, *International Interplanetary Commission* or *Internationales Zentralbüro für Raumfahrt* with a view to uniting the various national amateur clubs in one federated group, thus doing justice to the cosmopolitan character of their cosmic enterprise.<sup>28</sup>

Henceforth, the journal of the BIS not only regularly reported news on international developments, especially in Germany, France and the United States, but they also solicited articles from foreign supporters. Thus, Willy Ley placed the promised essay on «Rocketry in Germany» in the second issue published; four of the 14 pages of the entire volume were «International Interplanetary News». A year later, the twenty-year-old editor of *Männer der Rakete*, Werner Brügel, contributed an article presenting his plans for setting up an *International Bureau of Information on Rocketry* (abbreviated I.R.K.A. for *Internationale Raketenfahrt-Kartei*) that was supposed to combine in one single institution the functions of a global spaceflight

28 For the motto quoted in this section’s title, see H. H. Koelle, «Beginnende Weltraumfahrt?», undated pamphlet, LAB, 3 Rep. 020, Nr. 750. G. E. Pendray, «The German Interplanetary So-

ciety and the Raketenflugplatz», *Bulletin of the American Interplanetary Society* 9 (May 1931), 5–12; Cleator, *Rockets Through Space*, 133f., 139f.; Nebel, *Narren von Tegel*, 121.

agency, an archive of the movement's history and a continuously updated database of space research ongoing worldwide. And in the fourth volume, published in 1937, Robert Lencement reported from the *Exposition internationale des arts et techniques dans la vie moderne*, held in Paris in 1937, in which astronautic exhibits including a model of a spaceship and an oversized photograph taken from *Frau im Mond* had been prominently featured at the *Palais de la découverte*, the science museum located on the *rive droite*, next to the *Grand Palais* of 1900. Closely involved in assembling the much admired display was the aforementioned Alexandre Ananoff.<sup>29</sup>

Connecting with other space *personae* and quickly establishing a space international within a few years enabled the protagonists to counter the skepticism, disbelief and hostility often experienced at home. True, as Neufeld has compellingly shown, for more than two years, in 1928 and 1929, an unforeseen spaceflight fad, the so-called *Raketenrummel* or *Weltraumfieber*, was a central element of Weimar popular culture, culminating in the release of *Frau im Mond*.<sup>30</sup> Yet, there is strong evidence that the movement's protagonists did not immediately profit from growing popular interest and certainly not on the level of their self-image. Their interplanetary project seemed too far-fetched, their knowledge too deviant and remote. Ley, for example, reported time and again to have encountered 'the barriers of skepticism and ignorance', and with this Winkler agreed. 'In the beginning', he stated in 1933, reflecting on the VfR's marginal significance in spite of all their success, 'work was not easy. We had to put up with many superior sneers in those days.'<sup>31</sup> In the British case, public reactions seem to have been even more drastic and judgements harsher. Central figures of the early spaceflight movement repeatedly reported how they had been treated as marginal and as crazy outsiders at whom the established scientific community would jeer and audiences would laugh after public lectures, albeit 'in a perfectly courteous English way.' Cleator later described how, in 1933, he had specifically sought 'isolated enthusiasts, outcasts of conventional thought as myself' to form the nucleus of a society that would develop into 'a small group of enthusiasts and cranks', in retrospect described by its own members as 'pixilated' and 'unorthodox'.<sup>32</sup>

29 W. Ley, «Rocketry in Germany», *JBIS* 1 (April 1934) 2, 9–12; W. Brügel, «I.R.K.A. An International Bureau of Information on Rocketry», *ibid.* 2 (May 1935) 1, 6; R. Lencement, «Astronautics at the 'Palais de la Découverte'. Paris International Exhibition, 1937», *ibid.* 4 (December 1937) 2, 20–22; *idem.*, «Astronomy at the Palace of Discovery in Paris», *Popular Astronomy* 48 (December 1940), 188–194; A. Ananoff, *Les Mémoires d'un astronaute ou l'Astronautique Française* (Paris, 1978), 94–97.

30 Neufeld, «Weimar Culture and Futuristic Technology»; Nebel, *Narren von Tegel*, 65.

31 Ley, in *Männer der Rakete*, 122: «Schranken der Skepsis und des Unverstandes»; J. Winkler, *ibid.*, 102: «Im Anfang war die Arbeit nicht leicht. Viel überlegenes Lächeln mussten wir uns damals bieten lassen.»; Gartmann, *Träumer*, 95f.

32 Bloom, *Lit the Lamp*, 53; Cleator, *Rockets Through Space*, 136f.; *idem.*, «Autopsia», in: *JBIS* 7 (May 1948) 3, 97; A. V. Cleaver, «The Post-war Contribution of the B.I.S.», *Spaceflight* 3 (September 1961) 5, 169–172, here 169; Ross, «Gone with the Efflux», 101; Bainbridge, *Spaceflight Revolution*, 147.

As indicated before, the Second World War marked a divide. Between 1939 and 1945, the space international was entirely disrupted and all activities were put on hold. The history of rocket development under National Socialism in general, and that of the V-2, *Peenemünde* and the international missile race in particular, has generated and received more scholarly attention than any other aspect of the socio-cultural history of outer space in Europe. This oft-told story does not have to be repeated here.<sup>33</sup> Suffice it to say that the objective of developing a *Wunderwaffe* under engineer Wernher von Braun (1912–1977) led, within nine years, to a breakthrough in rocket technology, an unforeseen rise in its significance and, as a consequence, a degree of expertise, professionalisation and respectability hitherto unheard of. It proved also, *mutatis mutandis*, a decisive precondition for the American *Project Apollo*, inaugurated by President John F. Kennedy after Soviet cosmonaut Yuri Gagarin, on April 12, 1961, became the first human being to fly in space. As part of *Project Paperclip*, roughly 120 German rocket engineers together with more than 100 brand new V-2 rockets had been translocated, first in 1945 to Fort Bliss and White Sands, New Mexico, and a year later to the Army's Redstone Arsenal in Huntsville, Alabama, where they would develop a more powerful ballistic missile, the Saturn rocket family, to fly to the Moon. The fact that von Braun managed to keep most of his team together and continued working with its members in the United States was not only of the utmost importance for subsequent technological development but also led to the formation of a small, closely-knit community of rocket engineers and scientists. Although it has always been well known that about a half of them had been NSDAP members and helped to build the V-2 rocket for Hitler, still today, the *Peenemünders* – mostly long deceased – remain a household word with unambiguously positive connotations in NASA circles. Numerous German voices at that time, however, lamented the American exploitation of 'scientists as war booty' and, in consequence, a wide 'dispersal of brains', for instance the Protestant weekly *Christ und Welt* in 1950.<sup>34</sup>

Yet surprisingly and despite its enormous consequences, the Second World War hardly affected the internal manner of operation among the space *personae* and the shared sense of identity of the international space community. Many of its members had been translocated physically but their professional networks and personal contacts, quickly established and carefully cultivated before the war, could easily be reconstituted. On Friday, December 6, 1946, Willy Ley met with

33 Most notably by Neufeld, *Rocket and the Reich*. See also R. Einfeld, *Mondsüchtig. Wernher von Braun und die Geburt der Raumfahrt aus dem Geist der Barbarei* (Reinbek, 1996), and J. Erichsen and B. M. Hoppe, eds., *Peenemünde. Mythos und Geschichte der Rakete 1923–1989* (Berlin, 2004).

34 «Forschung heißt Leben. Die Zerstreuung der Gehirne», *Christ und Welt* 3 (23.02.1950) 8,

1, 3f.; J. Gimbel, «German Scientists, United States Denazification Policy, and the 'Paperclip Conspiracy'», *The International History Review* 12 (August 1990) 3, 441–465; idem, «Project Paperclip. German Scientists, American Policy, and the Cold War», *Diplomatic History* 14 (Summer 1990), 3, 343–65.

Wernher von Braun at Ley's home in New York City, the former being an émigré, the latter having considerably profited from the war. They opened a bottle of wine (two more would follow that night), toasted <to space travel> and <to the spaceship>, respectively, and started talking. By the early morning hours, all possible points of conflict had been removed. <In my opinion>, Ley reported to a friend the next day, reflecting on von Braun's Nazi past, <the man simply wanted to build rockets. Period.><sup>35</sup> Yet, such express reconciliation and the ability to quickly bury differences were common not only between the fellow compatriots or former members of the VfR but also between wartime enemies. Only four-and-a-half years after the last V-2 had hit London on March 28, 1945, the BIS' Council unanimously agreed to make Wernher von Braun an Honorary Fellow, a recognition which the honoree happily accepted <despite the grief the work of me and my associates brought to the British people>, apologising <for the wartime abuse of our V-2 baby> against England as one of his <most disappointing experiences> in life. In the ensuing longstanding correspondence between von Braun and Council Chairman A. V. Cleaver, the latter candidly conceded that he and other BIS members had been utterly impressed with the V-2's performance during the war, despite the self-evident fear of being hit.<sup>36</sup>

Thus, few ideological obstacles remained to resuming the pre-war attempts to institutionalise and internationalise the movement at one and the same time. Taking the initiative was the *Gesellschaft für Weltraumforschung* (GfW), refounded in Stuttgart on January 29, 1948 by Heinz Hermann Koelle (1925–), an engineering student and eventually a professor at *Technische Universität Berlin*. Six months later, during their meeting on June 22, 1949, a resolution on behalf of its board of directors was passed and signed by Koelle and Heinz Gartmann (1917–1960), an engineer and prolific writer about to assume Ley's role as the leading popular space author in post-war Germany. Subsequently, they circulated the resolution worldwide among the 23 astronomical societies known at that time and invited them to join their initiative. With a view to strengthening relations with the BIS, during the same meeting members of the GfW decided to appoint Val Cleaver Honorary Member of the GfW.<sup>37</sup>

A first international meeting, the *Premier Congrès International d'Astronautique*, was held in Paris on September 30, 1950 with the BIS agreeing to organise the second conference in London a year later in September 1951 when the

35 Willy Ley to Herbert Schaefer, 8./9.12.1946, NASM/WLC/30/5.

36 L. J. Carter to Wernher von Braun, 27.08.1949; Wernher von Braun to L. J. Carter, 29.09.1949; A. V. Cleaver to Wernher von Braun, 2.11.1949, all in Von Braun Papers: British Interplanetary Society, U.S. Space and Rocket Center Archives, Huntsville, Alabama [hereafter WvBP-H]. Parts of

the correspondence have been published by I. P. Willhite, «The British Interplanetary Society. Val Cleaver and Wernher von Braun», *JBIS* 54 (September/October 2001) 5, 291–299.

37 Protokollbuch der Gesellschaft für Weltraumforschung, 22.06.1949, DTM/HA, I. 3.008VV, 1/02, 29f.; «G.f.W. Conference», *JBIS* 8 (September 1949) 5, 202–204.



Courtesy British Interplanetary Society.

Fig. 4: Members of the BIS delegation visit the rocket and spaceflight exhibition held at the *Landesgewerbemuseum* during the *Third International Astronautical Congress*. Stuttgart, September 1–8, 1952. *Journal of the British Interplanetary Society* 11 (1952), 313.

momentous Festival of Britain was still being celebrated on the South Bank of the Thames, just across the congress venue. On this occasion about 40 delegates from ten nations representing 14 rocket societies founded the *International Astronautical Federation* (IAF), with the sole aim of promoting the realisation of space flight as a peaceful project and stimulating public interest.<sup>38</sup> When the GfW agreed to organise the third meeting, held in Stuttgart in 1952, it was combined with a rocket and spaceflight exhibition at the *Landesgewerbemuseum*, featuring models, salvaged parts of V-2 rockets and spaceflight drawings. Figure 4 shows members of the British delegation together with some of their German hosts, including H. H. Koelle (fifth from right), standing at the entrance in front of a huge film-still taken from *Frau im Mond*. Despite its transcontinental alignment, the IAF was predomi-

38 A. V. Cleaver, «Report on First International Astronautical Congress, Paris 1950», *Annual Report of the British Interplanetary Society* (1950), 315–325, including an incomplete list of rocket and space flight societies known in 1950; «Promotion of Space Flight. New International Body Set Up», *The Times* (5.09.1951), 6. Subsequently, annual congresses were held in Zurich (1953), Innsbruck (1954), Copenhagen (1955), Rome (1956), Barcelona (1957), Amsterdam (1958), London (1959) and Stockholm (1960); they continue to the pre-

sent day. L. R. Shepherd, «Prelude and First Decade, 1951–1961», *Acta Astronautica* 32 (July/August 1994) 7/8, 475–499; idem, «The International Astronautical Federation», *Spaceflight* 1 (October 1957) 5, 159–163; Gartmann, *Träumer*, 311–316; F. C. Durant III., *The First Decade of the International Astronautical Federation* (Wilmington/MA, 1959); J. Weyer, *Akteurstrategien und strukturelle Eigendynamiken. Raumfahrt in Westdeutschland 1945–1965* (Göttingen, 1993), 69–80, 101–105.

nantly a Western European organisation during its first decade. Although the *American Rocket Society* had been among the signatories in 1951 and the USSR sent, for the first time, two observers four years after its inception, their participation and presence remained limited. It was only in 1958, the year after Sputnik, that Wernher von Braun attended such a conference in person, and the first meeting *not* held in Europe was the 12<sup>th</sup> congress, taking place in Washington, D.C. in 1961. But five years later, in 1966, the IAF was already composed of 50 societies from 32 different countries.<sup>39</sup>

#### 4. Renewing the Promise of Space: European Astroculture and Utopian Cosmopolitanism before Sputnik

With the establishment of the IAF in September 1951, the institutionalisation of the <international trade-union of space men> (Wernher von Braun) came to a preliminary conclusion. The Second World War had previously disrupted the movement's long-held plans for setting up such a supranational federation and had caused a sudden standstill in its first phase of internationalisation (1931–1939). Although not all plans for the foundation of an International Institute for Astronautics and the direct involvement of the United Nations could be immediately realised, post-war reconstitution was now complete. With the end of the second phase reached (1946–1951), the age of the space amateur was indubitably over, giving way to that of the <doer> (*Verwirklicher*), as Gartmann wrote.<sup>40</sup>

At the same time, the Second World War had accelerated technological development to a hitherto unforeseen extent. Wartime atrocities, the use of machinery and the ongoing mechanisation of everyday life had only increased the widespread belief in a steadily progressing technoscientific modernity of which outer space was considered a paramount element. With actual space travel remaining far from a reality, its societal impact was more broadly perceptible than ever during the incipient <Golden Age of Space Travel>. <What is now happening in the field of physics will completely change our lives>, *Der Spiegel* concluded with some amazement in 1950, <Atomic energy and mega-rockets are more significant than occupation statute and peace treaties.><sup>41</sup>

Concomitant with this general shift in attitudes came a new social respect for the technician and expert in general, and the rocket engineer in particular – the

39 DTM/HA, I.3.008VV, 4/28. I.A.F. Membership List 1966–1967, NASM/WLC/16/5.

40 Wernher von Braun to A. V. Cleaver, 2.06.1951, WvBP-H: BIS. G. Loeser, «Die erste Aufgabe der internationalen astronautischen Föderation. Ein internationales Institut für Astronautik». *Weltraumfahrt. Beiträge zur Weltraumforschung und Astronautik* 2 (August 1951) 4, 74–77; Gartmann, *Träumer*, 222.

41 «Wohnbirne unterm Himmel», *Der Spiegel* (5.01.1950) 1, 35f.: «Was in der Physik jetzt geschieht, wird unser Leben vollkommen umgestalten. Atomenergie und Großrakete sind bedeutungsvoller als Besatzungsstatut und Friedensvorträge».

long prefigured space *persona* now well established and accepted. «The utopian Messianism of technology is no longer the product of enthusiastic bystanders but of design engineers working at the very centre of progress», an editorial observed. Realising and appreciating this newly-won respectability, Cleaver and Clarke would retrospectively agree in describing this decade between the reconstitution of the space international after 1946 and the rearrangement of state activities with a Churchillian phrase as the movement's «finest hour». «Not that there is much hostility from the public to the idea of space travel as there was before the war», a third BIS member agreed in 1953: «After the atomic bomb and the V-2, the man-in-the-street is prepared to believe anything is possible to the scientists and engineers.»<sup>42</sup> Largely uncontested by any lobby groups, government agencies, supranational organisations or industrial firms, at least for the time being these crackpots-turned-scientists enjoyed a space monopoly. Thus, when Sputnik eventually began circling the skies in October 1957, triggering a global «reality effect» (Roland Barthes), though by no means a worldwide «shock», the stage had long been set on earth. European space experts were well positioned to react to a rapidly rising demand for what was publicly no longer conceived as peripheral but absolutely central knowledge, indispensable to survive in a bipolar world increasingly pervaded by the East-West conflict.<sup>43</sup>

However, that this societal respectability had its price became clear when, as early as 1947, the first wave of UFOs was sighted in not only the American but also the European skies. The epistemological challenge threatened to get out of hand in the early 1950s when unconventional authors such as Donald E. Keyhoe (1897–1988), George Adamski (1891–1965) and Desmond Leslie (1921–2001) landed on bestseller lists with titles such as *The Flying Saucers Are Real* (1950), *Flying Saucers from Outer Space* (1953), *Flying Saucers Have Landed* (1953) and *Inside the Space Ships* (1955).<sup>44</sup> From the outset, the fundamental tension between «science» and «fiction», so inherent to Astroculture at large, had manifested itself in the activities of the rocket societies, more so in the BIS than in the VfR and its self-declared successor organisation, the GfW. In a letter written in December

42 R. Held, «Offerte in Lenkgeschossen. UnsachgemäÙes zum Raketenzeitalter», *Frankfurter Allgemeine Zeitung* (20.07.1957), Bilder und Zeiten 1 f., here 2: «Der utopische Messianismus der Technik geht nicht mehr von Schwärmern am Rande, sondern Konstrukteuren im Zentrum des Fortschrittes aus.»; Clarke, «Memoirs of an Armchair Astronaut (Retired)», 411; Dr. Derek Lawden to Wernher von Braun, 12.02.1953, Wernher von Braun Papers, Manuscript Division, Library of Congress, Washington, D.C., 1/4.

43 A. V. Cleaver, «The Post-war Contribution of the B.I.S.», here 169. A. C. T. Geppert, «Anfang – oder

Ende des planetarischen Zeitalters? Der Sputnik-Schock als Realitäts-Effekt, 1945 – 1957», in *Im Zeichen des Sputnik*, ed. I. J. Polianski and M. Schwartz (Frankfurt am Main, forthcoming).

44 D. E. Keyhoe, *The Flying Saucers Are Real* (New York, 1950); idem, *Flying Saucers from Outer Space* (New York, 1953) (D: *Der Weltraum rückt uns näher*, Berlin, 1954); D. Leslie and G. Adamski, *Flying Saucers Have Landed* (London, 1953); G. Adamski, *Inside the Space Ships*. (New York, 1955); H. Schäfer, «Die «Flying Saucer Story». Eine neue Form der Okkultkriminalität», *Sterne und Weltraum* 1 (Oktober 1962) 7, 140–143.

1943, Clarke explained this conflict to literary scholar C. S. Lewis (1898–1963), with whom he corresponded extensively after the Christian writer had opposed the idea of space conquest as blasphemy, attacking potential explorers as overindulging agents of interplanetary imperialism. «The interplanetary societies», Clarke reasoned,

«are composed partly of those excited by the ideas of science-fiction and anxious to see space conquered in their own lifetimes, and partly of engineers interested in a technical problem. The latter often despise science-fiction but although claiming to be pure scientists realise the stupendous implications of space-flight and are in reality thrilled by the idea as much as the science-fiction «fan».»<sup>45</sup>

To increase societal acceptability and for the sake of professionalisation and institutionalisation, activists had, over the years, succeeded in shifting priorities by undergoing a self-imposed process of intellectual streamlining and devaluating these «ideas of science-fiction». In 1950, the GfW even added a new clause to its statutes forbidding its members to «propagate fantastic or pseudo-scientific ideas». <sup>46</sup>

Yet, now that the pendulum was swinging back and the public's interest was growing with each new wave of UFO reports covered extensively, if not uncritically, by the most respectable newspapers such as the *Times* and *Der Spiegel*. Now established space experts such as Clarke and Ley did not know how to respond without endangering their hard-won professional respectability. Although unremittingly at great pains to debunk what they considered utterly irrational claims and which they termed, along with C. G. Jung, author of a most insightful treatise on the subject, as a myth in the making, the BIS did not entirely succeed in distancing themselves from the phenomenon. The GfW's decision to simply not issue any official statement also failed to strengthen their position. «The Flying Saucers caused us considerable embarrassment and annoyance», Clarke conceded in retrospect, «because there was a danger that in the public eye we should be associated with the cranks and crackpots who were spearheading the cult.» Twenty years earlier, in the 1930s, almost verbatim expressions had been used to depreciate them. <sup>47</sup>

There was a second, equally ironic reason for which the societies' Churchillian moment did not last beyond the late 1950s. Visionary as they may have been in the

45 Arthur C. Clarke to C.S. Lewis, Dec. 1943, *From Narnia to A Space Odyssey. The War of Ideas between Arthur C. Clarke and C.S. Lewis*, ed. R. W. Miller (New York, 2003), 8, 37.

46 «Protokoll der Mitgliedervollversammlung vom 21.6.1950», in: Protokollbuch der Gesellschaft für Weltraumforschung, DTM/HA, I.3, 008VV, 1/02, 81: «§4 der Satzung (Aufnahme) wird durch

folgende Neufassung ersetzt: Wer phantastische oder pseudowissenschaftliche Ideen propagiert, wird nicht aufgenommen.»

47 Ibid., 64. C. G. Jung, *Ein moderner Mythos. Von Dingen, die am Himmel gesehen werden* (Zürich, 1958) (Eng. *Flying Saucers. A Modern Myth of Things Seen in the Sky*, London 1958). Clarke, «Memoirs of an Armchair Astronaut (Retired)» 413.



1930s, the self-made experts had not anticipated that the state could easily progress without them once space, with Sputnik, had transformed into a new arena of traditional foreign policy and formed part of the fight for global hegemony. Thus, their role during the complex institutional setup of what would later become the *European Space Agency* (ESA), begun with the creation of its two precursor organisations, the *European Launcher Development Organisation* (ELDO) in 1962 and the *European Space Research Organisation* (ESRO) in 1964, was, again, entirely marginalised in different national contexts for a variety of reasons but to the same effect. In the end, Willy Ley's conclusion that, with the establishment of the VfR in 1927, <the idea of space travel had found a legal and so-to-speak official platform from which to speak> could be extended to the entire early spaceflight movement. By forming a closely-knit community of internationally connected space experts who, through transforming themselves, created the space *persona* and laid the foundation to the <rocket scientist> myth, its members demonstrated at a pivotal, yet short-lived historical moment how outer space could effectively be made imaginable *and* socially respectable while remaining a central element within European cosmopolitanism. Yet, by the time space travel seemed to come into actual reach, this fleeting, futuristic moment had already passed, giving way to large-scale Cold War geopolitics.<sup>48</sup>

48 Ley, «End of the Rocket Society», pt. I, 65.