Androgynous Coupling and the Engineering of Peace: A Cold-War Romance in Space

Andrew Jenks

In July 1975, the Apollo-Soyuz Test Project presented a unique opportunity and challenge for a group of space engineers. By designing a docking system for Soviet and American capsules, the engineers were well aware that their task went beyond the normal technical challenge of aerospace design and involved integrating political goals into their technological blueprints. In effect, their mission was to create a technological fix in the form of a docking mechanism that would link the superpower space systems (the Apollo and Soyuz capsules), and in so doing reduce superpower tensions and perhaps even avert Mutual Assured Destruction. This article examines the technopolitics of the Apollo-Soyuz mission and whether or not the docking design actually worked, both in the narrower technical sense (as a functional space-docking system) and for Détente's broader goal of making superpower relations more peaceful and mutually-beneficial.

The term "technological fix" was coined in the 1960s by the Director of Oakridge National Laboratories, Alvin Weinberg. The basic idea was hardly new. Modern faith in technology had produced a mania for technological fixes, a belief that, "solutions founded on technological innovation may be innately superior for addressing issues traditionally defined as social, political, or cultural."[1] The main attraction of the technological fix is that it promises to bypass the cultural and political challenges of changing behaviors and attitudes by shifting the problem to the supposedly objective realm of technical problem solving, and to the experts and engineers who supposedly have only technical rather than partisan goals. For example, advocates of nuclear power in the 1960s, like solar or wind power today, presented it as a solution to the economic and political dilemmas of fossil-fuel dependence. If it worked as planned, politicians would avoid the hard work of changing deeply entrenched behaviors of energy consumption, providing a cheap way to produce and consume power that would also protect the environment. It was a case of having your cake (energy independence and a cheap power source) and eating it too (blissfully tapping into the electric grid without destroying the environment).

ASTP was a technological fix designed to make superpower relations less

1. Sean Johnston, "Alvin Weinberg and the Promotion of the Technological Fix," *Technology and Culture* 59, no. 3 (2018): 621.

Figure 1: The Painting of the Apollo-Soyuz Docking Commissioned by NASA. All photos and illustrations in this article are from NASA and are in the public domain

dangerous and more secure, and it had the added benefit of advancing the cause of space exploration, thus killing two birds with one stone or, in the spirit of joining two different ways of looking at a similar problem, killing two rabbits all at once (as the Russians say). Up to that point, with the US mired in Vietnam and Soviet troops blasting away hopes of reforming communism in Czechoslovakia, little else seemed to be working to mitigate the literally explosive potential of superpower relations. Discussions among politicians and managers in the first Nixon presidency had resulted in various memoranda of agreement for collaboration with Brezhnev, which prepared the handoff (or perhaps a Hail Mary, to continue the American football analogy) of the political challenge of détente into the open arms of aerospace engineers.[2] The technical problem of collaboration was hashed out among Soviet and American engineers in 1970 discussions, who now occupied ground zero in the techno-politics of détente.

Negotiations focused first on a linkup between the Soviets and the nascent Skylab project at NASA (which would be launched in 1973 and 1974). But due to the existing designs of docking systems for both sides, the Soviets quickly rejected this idea as requiring joint construction of not just the docking mechanisms but of all other aspects of launch and capsule systems to permit the docking. This was because existing docking systems, as conceived by Soviet and American engineers, involved one spaceship (the male) penetrating the other (the female),

2. For more details on the political history of ASTP and space collaboration in general, see my book *Collaboration in Space and the Search for Peace on Earth* (London: Anthem Press, 2021).

and neither side had the will, time, or money to figure out who was going to penetrate and who was going to be penetrated, much less how to redesign existing systems to accommodate the penetrating/penetration (they were all men). As is often the case in technological fixes, the fix itself creates a whole new set of problems that make the "fix" seem more like a new problem in need of additional fixing. Such a redesign, from the Soviet point of view, would have meant supplying sensitive information about the design of their systems that might not be reciprocated by the American side. Moreover, the Soviet task seemed primarily to provide support services for the star attraction, that is, the new technology of the American Skylab. Besides, Brezhnev and Nixon both wanted a quick fix as well as a technological one, and linking up with Skylab was neither quick nor technologically simple. While the discussions were at first tense and marked by mutual suspicion, the more engineers and managers from both sides talked, the more relaxed the atmosphere became. As with the political principals and managers, the Soviet engineers appreciated the informality and openness of the American partners, as well as their hard-working, hard-partying spirit, and this facilitated an atmosphere of trust that encouraged the search for a design principle that would maintain parity and mutual respect.[3]

Still, the technical challenges were daunting, and bound to be made even more daunting because of the political demand for parity. "To realize a docking by means of identical mechanisms…was impossible," noted the Soviet flight director Eliseev, because that meant designing and building everything from scratch. The only solution was to find a universal docking mechanism that would connect peripherally to the two existing systems (Apollo and Soyuz), and thus allow both sides to meet each other in space on their own terms and in their own space systems. It would take more than two years from 1970 to work out the design for the mechanism, during which the quest for parity would be challenged by the different nature of both systems. For example, the US used pure oxygen in space, while the Soviets used a mixture that was closer to air on Earth as a blend of oxygen and nitrogen. This meant that the different internal environments would mix during docking, depending on which crew was the visitor and which the host. The visitors would therefore have to enter the docking module and adapt to the air of the host. So if a neutral space between the two could be created – a kind of Switzerland in space -- it could provide for the transfer of one crew to the other system as the transferring crew adopted to the breathing system of the other. As the mission continued, each system would take turns adapting to the needs of the other, practicing survival in a foreign but friendly environment.[4] The engineering challenge thus dovetailed with the socio-political challenge of providing an interface between two fundamentally different systems without one system dominating the other and imposing its will on the other, and the end result was that everyone survived. The outcome of not only the mission but also of

3. A. S. Eliseev, *Kaplia v more* (Moscow: Aviatsiia i kosmonavtika, 1998), 100-102.

4. A. S. Eliseev, *Kaplia v more* (Moscow: Aviatsiia i kosmonavtika, 1998), 103; on the engineering idea for this system for equalizing air systems, see the report from October 1973: ARAN, F. 1678, op. 1, ll. 67-68.

détente would hinge on the ability to maintain the appearance, if not reality, of technical parity, thereby placing engineering into the forefront of finding a way back from the brink of nuclear holocaust that engineers, of course, had also helped to design.

The Buddha of Docking

Vladimir Syromiatnikov, the lead docking engineering for the Soviet side, enthusiastically embraced the challenge of finding a politically and technically functional docking design. He is a remarkable and underappreciated figure in space history who garnered all the Soviet, Russian and international accolades that an aerospace engineer could receive: the Lenin Prize in 1975, the NASA Distinguished Public Service Medal, the prize in his name with the International Association for the Advancement of Safety, and many others. He taught himself English and then French, which he quickly mastered through collaborations with both NASA and the French space program.[5] Until his death in 2006 from leukemia he continued to teach new generations of engineers in a number of institutes. He was an early and enthusiastic advocate of computer systems and technology, which made perfect sense, since the utopian ideas often associated with the early days of computer connectivity dovetailed with his notions about the deep importance, symbolically and physically, of the very act of docking, whether on Earth or in space. His mission was therefore far broader than ASTP and involved nothing less than creating a "school of docking," as the famous Soviet space engineer Boris Chertok noted, with disciples who would carry on his socio-technical vision of a global space network that would link "the space systems of Russia, America and Europe" and, in so doing, provide bridges across cultures, languages, and ideologies.[6]

Born in 1933 in Archangel, Syromiatnikov was one year older than Yuri Gagarin. Like the first cohort of cosmonauts, he was a child of the horrors of WWII, experiencing the humiliation, suffering, and extreme privations of the Nazi invasion. The younger Syromiatnikov went to primary school in the Moscow Oblast' city of Kaliningrad (now named after the rocket engineer and his future patron Korolev), which was a center for military industrial production, and in the late 1940s emerged as the hub of strategic rocket and space programs. The experiences of the war, combined with the romance of space exploration, drew him to aerospace engineering in the late Stalin years. After finishing school – where he excelled in both his studies as well as sports and chess -- he studied engineering at the famous Bauman Higher Technical Institute, and then in 1956 joined OKB-1 NII-88 – the center for the space and missile industry run by the

5. When working with American counterparts he refused the services of translators and insisted on speaking English, and he would double-check and correct all official NASA translations of his conversations into English, which often held up the official acceptance of meeting minutes. Interview with Caldwell Johnson, 12 May 1998, League City Texas, NASA Johnson Space Center Oral History Project, 54-55. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm

6. Vladimir Syromiatnikov, *100 Rasskazov o stykovke i o drugikh prikliucheniakh v kosmose i na zemle, Chast' 1* (Moscow: Izd. "Logos", 2003), 6.

father of Soviet rocketry, or Chief Engineer as he was known publicly until his death in 1966, Sergei Korolev. The young engineer worked in the strategically vital area of developing missile guidance systems and the development and deployment of payloads – satellites, dogs and people -- into orbit.[7]

Syromiatnikov's early inspiration in the Soviet military industrial complex, according to Chertok, was to achieve the strategic parity with the US and thus prevent a repeat of the horrors of invasion and mass death at the hands of the Nazis.[8] It was common for those who came of age and studied in the immediate post-war period to devote themselves to technical fields – rocketry, telemetry, radar, nuclear technology, telecommunications, and computers. This was their way of capturing some of the glory of their elders who fought against Nazis. Too young to fight on the front lines of the war, and thus to enjoy the prestige and honor that came from active military service during the war, Syromiatnikov's generation compensated by developing strategically important technologies to fight the next battle in what soon would be called the Cold War.

With the dropping of the bombs on Hiroshima and Nagasaki, and the fresh memories of the horrors of war, Syromiatnikov's generation needed little motivation to excel in their studies, which they ultimately hoped would contribute to making the Soviet Union the economic, military, and technological equal of the United States. A testament to his talents and personality, Syromiatnikov began working almost immediately after Sputnik as a senior engineer in charge of producing durable objects for use in the vacuum of space. He was enthusiastic, curious, and optimistic, continuing his studies as a graduate student in the mechanical engineering department at Moscow State University in 1962, where he also worked with other professors and students to design and construct objects for the various missions of the Soviet space program. The dramatic successes of Sputnik and then of Gagarin's flight were both a confirmation of the success of the collective efforts of thousands of engineers and a promise of even greater things to come. In 1968 he defended his doctoral dissertation on the gauges that he had designed for long duration in space. Like many of his colleagues, he retained close links between theoretical and academic work and translating those ideas into reality; he thus forged close ties to the academic world until the end of his life, working in the classroom as an engineering and computer science professor (Professor of Technical Cybernetics at Moscow State University), in addition to a manager and designer in the Soviet and Russian space programs. In 1979 he became a Doctor of Technical Sciences and in 1989 achieved the highest academic title in the Soviet Union of "Professor."[9]

He was well liked, curious, good-natured, hard-working, creative and

7. "Vladimir Sergeevich Syromiatnikov: biofrafiia i deiatel'nost'," http://yubik.net.ru/publ/59-1-0-10329?fbclid=IwAR1g55eDTnQMgxoKhA-Lmf_TWxqZPAJ_DvXaG1RJvEvOUrMHzbTv1_pVNls

8. Syromiatnikov, *100 rasskazov Chast' 1*, 6.

9. "Vladimir Sergeevich Syromiatnikov: biografiia i deiatel'nost'," http://yubik.net.ru/publ/59-1-0-10329?fbclid=IwAR1g55eDTnQMgxoKhA-Lmf_TWxqZPAJ_DvXaG1RJvEvOUrMHzbTv1_pVNls

constantly aware of the connections between the technological and human worlds. He often carried a notepad in which he could sketch out design ideas where ever they might appear in his mind's eye. His American colleagues affectionately called him "Big Cheese" ("Syr'" in Russian means cheese).[10] Many have an enduring image of him riding the public trolley, intensely devouring some book – either technical or literary. He attempted to bridge what C.P. Snow in the West called the "Two Cultures" of humanities and sciences and what Soviets referred to as the divide between the lyricists and the engineers. As such, he hardly fit the profile of the narrowly educated Soviet engineer unable to see the broader connections between technology and society.[11] His favorite artist was the poet, actor, and singer Vladimir Vysotsky, whose lyrics and songs he knew by heart (he honored the legendary singer, actor and songwriter at his gravestone in 1980, along with the cosmonaut Georgii Grechko). He developed a long list of colleagues and friends in the secret and open worlds of Soviet engineering and academia, and then internationally (becoming the first Russian citizen in 1995 to become an acting member of the American Institute of Aeronautics and Astronautics as well as the International Academy of Astronautics). A personal talent for connecting with people was reflected in his professional engineering interest in designing mechanisms to link objects in space. Those objects, in turn, would join different cultures and political systems into heterogenous networks that would unite people to other humans, to different political systems and to the technological devices and artifacts that modern industrial civilization had produced. To use the term of the French philosopher and historian of technology Bruno Latour, the new society that he enabled through docking would be "technology made durable": an amalgam of human and non-human actors crossing the Cold War divide between the US and USSR.[12] Syromiatnikov later imagined himself as a Soviet Hermes, the divine trickster of ancient Greek mythology who was a protector of roads and travelers who could move freely between the divine and human worlds and transgress boundaries and barriers, just like the androgynous docking mechanisms he designed.[13]

Engineering for Safety

For Syromiatnikov, docking, whether at sea or in space, is always a moment

10. Patricia Sullivan, "Vladimir Syromiatnikov; Designed Docking System for Space Capsules," *Washington Post*, 1 October 2006, https://www.washingtonpost.com/wp-dyn/content/article/2006/09/30/AR2006093001038.html.

11. For the argument that the Soviet system produced narrowly educated engineers: Loren Graham, *The Ghost of the Executed Engineer: Technology and the Fall of the Soviet Union* (Cambridge, MA: Harvard University Press, 1993).

12. Bruno Latour, "Technology Is Society Made Durable," *The Sociological Review* 38, no. 1 (May 1990): 103–31. Latour developed the concept of Actor Network Theory: Michel Callon, "Society in the making: the study of technology as a tool for sociological analysis", in Bijker, Wiebe E.; Hughes, Thomas P.; Pinch, Trevor, eds., *The social construction of technological systems: new directions in the sociology and history of technology* (Cambridge, Massachusetts: MIT Press, 1987), 83–103.

13. V. S. Syromiatnikov, *100 rasskazov o stykovke i o drugikh prikliucheniakh v kosmose i na zemle, Chast' 1, 20 let spustia* (Moscow: Logos, 2010), 212.

of heightened importance. As a technical accomplishment it requires a carefully planned, precise and choreographed maneuvering of immense objects. Getting it wrong can have disastrous and deadly consequences, but especially in space, with capsules the size of Mack Trucks moving at 25,000 miles per hour. In some ways the act of docking was similar to a mating ritual and act, and it certainly has invited such imagery. But the parallel breaks down if one considers the careful planning required for a successful docking. It lacks spontaneity and is realized through human steering and guidance systems far removed from the points of contact. Syromiatnikov also enjoyed docking as a test of his ability to calculate the trajectory of objects traveling thousands of miles an hour through various atmospheric layers and into the vacuum of space, and under the complex gravitational pulls of multiple celestial objects. Once completed, the act of docking connected humans across physical spaces, allowing for the exchange of much-needed supplies and human company. With the completion of the technical phases of docking that linked one physical system with another, docking then became cultural, linguistic, political, and social, as people from far away, and often living in isolation for long periods of time, suddenly were able to step across the threshold of their ship and into a different world.

For Syromiatnikov, the creative challenge of uniting two very different space systems, designed and built in completely different social and political contexts, was an almost religious experience of experiencing universal connectedness. The feeling was similar to the "overview effect" experienced by cosmonauts and astronauts viewing the earth from space. Making these connections physically possible transformed the docking engineer and planner into a potentially powerful agent of change. No wonder Syromiatnikov thought of himself as a modern-day Hermes. At one point he described his role as a theater director. "Cosmonautics became a specific art under the dome of the universe with millions of people as its audience." He frequently referred to his docking technologies, and the new kinds of worlds their connections created, as instruments of "destiny."[14] He noted that individual space ships, like human beings, had limited utility; they had to be connected with each other to engage in meaningful work, a task he and his Soviet associates began to pursue with the success of the first Vostok missions.[15] The moment of docking was pregnant with transformative possibility, marked by intense emotions, feelings of danger, hope, and the anticipation of new things to come. It made perfect sense, therefore, that political leaders in the original Nixon-Kosygin accords immediately identified docking as the logical starting point for the policy of détente. "Docking, by definition" as Syromiatnikov was fond of saying, "is already a form of cooperation."[16] In one of his many philosophical moments, Syriomiatnikov connected his engineering to his grander vision of a new kind of world:

14. Vladimir Syromiatnikov, *100 Stories About Docking and Other Adventures in Space and On Earth* (Moscow: Universitetskaia kniga, 2005), 14, 18.

15. Syromiatnikov, *100 Stories*, 134-35.

16. Syromiatnikov, *100 Stories*, 13, 391.

> It was just as the first space-rocket scientist K. Tsiolkovskii imagined: the more we penetrate the universe, the more mysterious and inexplicable the world becomes, governed by some unclear first organizing principle. Tsiolkovskii operated with terrestrial and heavenly categories, trying to connect them with the help of his multi-stage rockets. He deified humanity, its origin and intellect. He believed in humanity, in the ability of people to colonize the universe, starting with its own cradle – Earth. In order to continue this journey it was necessary to divorce ourselves of short-term motives and profit, to move away from politics, to transcend the borders that divide people on earth. Perhaps then Hermes would again move closer to people and fulfill his mission: to be a protector of shepherds and travelers, rocket engineers and cosmonauts, and also trade and profit. He will facilitate mutually advantageous international cooperation, to put it into stilted language.[17]

While docking had great potential cultural and political significance, it also reflected an aspect of engineering that had been conspicuously ignored in the early years of the space race and Cold War, that is, safety. The Cold War in the late 1940s had greatly increased the tolerance for risk-taking in politics and technology, dramatically raising the stakes of victory or defeat as both sides began to develop large arsenals of weapons of mass destruction. As scholars have noted, ideas about risks and safety were couched in the language of scientific objectivity but were themselves socially constructed, often in accordance with the desires of powerful economic and political interests.[18] A high tolerance for risk taking and dangerous technology had produced the doctrine of mutual assured destruction and transformed strategic superpower parity into a game of chicken with weapons of mass destruction aimed at each other. The appetite for risk-taking, however, was not limitless and together with high-profile disasters and technological failures it could produce new regimes focused on risk-reduction and safety, as reflected in the new move toward arms control and limiting the testing of nuclear weapons after the Cuban Missile Crisis. An increasing awareness of the negative consequences of excessive risk, including the possibility of destroying the earth, the damage to the environment highlighted by Rachel Carson, the use of Agent Orange in Vietnam, the accidents that led to deaths in the both the US and Soviet space programs – all these things and more helped to generate a new focus on safety in the 1960s and 1970s.

ASTP emerged from an emerging global culture of safety in the 1960s. It marked a transition from a politics based on risk-taking to a politics focused on global and individual security. The "test" of the Apollo-Soyuz Test Project, for

17. V. S. Syromiatnikov, *100 rasskazov o stykovke i o drugikh prikliucheniakh v kosmose i na zemle, Chast' 1, 20 let spustia* (Moscow: Logos, 2010), 216.

18. On the social construction of risk: Scott Sagan, *The Limits of Safety: Organizations, Accidents and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993); Diane Vaughn, *The Challenger Launch Decision: Risky Technology, Culture and Deviance at NASA* (Chicago: Chicago University Press, 1996)

example, was to save lives in space in the event of a catastrophic failure of a manned ship or station in orbit (and speaking more broadly, the saving of lives by preventing nuclear war between the US and USSR). Syromiatnikov claimed that his American colleagues, in part, had been inspired by the 1969 Hollywood movie, "Marooned," featuring a blockbuster cast of Gene Hackman, Gregory Peck, and James Franciscus. It hit theaters as both sides were launching into negotiations in 1970 for the docking project that was to anchor detente.[19] In the film a Soviet spacecraft comes to the rescue of a disabled American spacecraft in orbit. One astronaut has already died and the other two were drifting into unconsciousness. But the Soviet spacecraft was too small to accommodate the two astronauts and lacked oxygen for them. Fatally, it also lacked compatible mechanisms for docking with the American spacecraft. An American rescue vehicle finally arrived and the Soviet cosmonaut helped to rescue the two surviving astronauts. The movie highlighted the central problem of crewed space flight, namely, the extreme risk associated with having no backup safety and rescue system. Flipping the script of the movie and preventing death in space would require a universal docking mechanism that spaceships of any design could use to facilitate rescue.[20]

ASTP was thus an important test case in the creation of both technical and political regimes of safety during the Cold War. In the interests of safety, both sides had to learn to adapt to the system of command and control of the other. The Soviet flight director noted that neither side had the right to take measures that would put the other side's crew at risk. This guiding principle was central to the larger policies of détente, which were based on the notion that the actions taken by one side could put all lives at risk, and creating ever-more elaborate regimes of mutual dependence would in turn heighten a mutual appreciation of safety and security.[21]

Syromiatnikov was thus a new breed of engineer valued for his ability to make the Cold War, and space travel more generally, safer for its participants. He had the added advantage, unlike his American colleagues, of witnessing the horrors and insecurities of WWII, which had inspired the risky quest for parity in nuclear weaponry and rocketry, but paradoxically had also made the world a much more dangerous place in the process. From his privileged vantage point deep within the Soviet military-industrial complex, he had turned space engineering from a weapon of war and into an instrument of peace activism. Of course, the very act of docking was itself a risky procedure. "Docking is never a routine event!," he once wrote.[22] But just as defense intellectuals could imagine that weapons of mass destruction could be "peacekeepers" and prevent war, the risks associated with docking could pay dividends – if the docking worked – by improving the chances that the superpowers could survive the disastrous consequences of their

19. Syromiatnikov, *100 Stories,* 378-79.

20. V. S. Syromiatnikov, *100 rasskazov o stykovke i o drugikh prikliucheniakh v kosmose i na zemle, Chast' 1, 20 let spustia* (Moscow: Logos, 2010), 220.

21. A. S. Eliseev, *Kaplia v more* (Moscow: Aviatsiia i kosmonavtika, 1998), 104-105.

22. Syromiatnikov, *100 Stories*, 375.

own ideological and military divisions.

Moscow to Houston: We Have a Docking Problem

Even before ASTP, both sides were separately working on a docking system that the Apollo-Soyuz test project would dub the "APAS" (*Androginno-periferiinyi agregat stykovki*, or androgynous peripheral assembly system for the American side). Its roots go back to the mid-1960s, when the Soviet engineers, led by Korolev and Syromiatnikov, were attempting to develop a new docking mechanism between different Soviet capsules in the 1960s. Prior to ASTP, the Soviets were using a "mama and papa" docking system (the colloquial reference among Soviet engineers for the "shtyr'-konus) that was obviously gendered and involved a passive and active partner. The Americans had used a similar design referred to more formally by NASA engineers (also all male) as "male-female." These types of docking systems required the penetration of one capsule by the other, which would cause one side (given the male-dominated and macho engineering cultures on both sides) "to feel their position of humiliation," in addition to the added burden of having to design both capsules to accommodate penetration.[23]

The design idea for the mama-papa system, said Syromiatnikov, came from "the age-old principle of mating on Earth mastered by Mother Nature… two free-flying spacecraft, similar to buses in size and mass, would get coupled and then structurally engaged, and then would fly in this mode until separation." Similar to their counterparts in the world of defense intellectuals in the US, the Soviet engineers often imagined their work in sexual terms.[24] Mating thus became a convenient shorthand for complex engineering couplings. Through the mid-1960s docking simulations were popular events among space managers, engineers, and politicians in the OKB-1 NII-88 facility, a kind of mechanical peep show. "Docking became a popular performance, something like an erotic show of a space character," remembered Syromiatnikov. "Hold the stallion," said one engineer, positioning the probe at the entrance of the cone.[25]

Nonetheless, the Chief Engineer Korolev was frustrated by the limitations of the mama-papa docking systems. The Soviets in the early 1960s were moving from merely launching capsules into space to actually joining them together, like lego pieces, for projects involving longer term habitation and space colonization. He pushed Syromiatnikov to design a new kind of docking system, fundamentally different from the mama-papa system, that would create a pressurized tunnel between the two docked spaceships and not require the re-engineering of both

23. Natalya Serkova, World Wide Gold, e-flux, no. 93, 2018, https://www.e-flux.com/journal/93/213267/world-wide-gold/; Viktor Khokhlov, "Kuda khodiat mechty: razmyshleniia v godovshchinu kosmicheskogo iubileia," *Gefter*, March 23, 2015, http://gefter.ru/archive/14617.

24. For the sexual images and language of strategic defense in the Pentagon: Caron Cohn, "Sex and Death in the Rational World of Defense Intellectuals," *Signs*, Vol. 12, No. 4 (1987): 687-71

25. Syromiatnikov, *100 Stories*, 164, 168-9, 177.

ships to accommodate the "mama-papa" penetration (one as the penetrator and the other as the receiver). Syromiatnikov had continued to work on that system even after Korolev died in 1966 and Gagarin's death in 1968. "The docking system we designed and developed in 1968-70 had androgynous docking rings with a set of structural latches," wrote Syromiatnikov, though they had not yet coined the term "androgynous" to describe that system. Those latches were designed to attach to both docking ships and produce a pressurized transfer tunnel once the capsules had connected to each other externally.[26]

While both sides appeared to have been in various stages of producing docking systems based on the androgynous concept, the first meetings in 1970 between American and Soviet engineers on October 24 and 26 in Moscow -- referred to later as "Great October Revolution in the relationship between cosmonautics and astronautics" – initially contemplated using the more conventional docking systems. The Americans thus first proposed "an Apollo-type receiving cone to be installed into the Soviet transfer tunnel," which the American engineer Caldwell Johnson illustrated with slides of a Gemini capsule docking in which "the active part is placed on the nosecone…This is the classic conception of the male and female part." The proposal, however, was a non-starter as the Soviets had no intention of being the passive partner. Said Syromiatnikov: "Our goal was to have a full-fledged and equal partnership on a joint project with such activities as engineering and design, followed by the development and testing of the new concept with actual docking in space, namely – APAS."[27] Truth be told, the Americans were also dissatisfied with the design, and like the Soviets they had also been contemplating a new docking system. Caldwell Johnson, Syromitanikov's NASA counterpart, explained that their male-female system meant that the docking mechanism "occupies the very passageway that you want to open…and it should not be that way, because all kinds of things can go wrong. If you can't get it out of there properly, then it's no use to even have docked it… it's like having everything in the doorway. Even after you connect, you can't open the doors because you've got all this stuff in the way." The Americans therefore came into the negotiations prepared to consider a new design approach after their male-female proposal clearly fell flat with the Soviet engineers.[28]

Johnson then sketched out the desired attributes of a future system, which just so happened to reflect the new docking system that Syromiatnikov had already been designing for link ups between Soyuz and Salyut capsules in the Soviet space fleet for the past two years. "First," said Johnson at the meeting, "the mechanism should be androgynous, that is, it could be grabbed onto from either side and would not have a male and female part." During the docking either side could play the role

26. Syromiatnikov, *100 Stories*, 339-40, 379, 395.

27. Syromiatnikov, *100 Stories*, 339-40, 379, 395. Caldwell Johnson's presentation in Moscow is contained in: Caldwell Johnson Presentation, Moscow, October 26, 1970, ARAN, f. 1678, o. 1, d. 108shch, ll. 43-53.

28. Interview with Caldwell Johnson, 1 April 1998, League City Texas, NASA Johnson Space Center Oral History Project, 22-23. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm

of active or passive partner, meaning that one would agree to be active and initiate docking maneuvers, and the other would agree to be passive and stay still, so that both sides could then grab each other; and either side could likewise be the active or passive partner in disengaging.[29] Years later Johnson recalled: "We had lucked out and had prepared ourselves for the very thing that they wanted to talk about when they got to it." If the Soviets immediately understood the design principle that Johnson was proposing, precisely because they had already been working on it and would propose the same concept at the October meeting right after Johnson, they were a bit perplexed by the word "androgynous," which appears misspelled in the Russian translation of the meeting transcription in the Academy of Sciences archive as "endogennyi" instead of "androginnyi."[30] The Soviet translator apparently did not understand the meaning of the word "androgynous" that Johnson had used. Syromiatnikov admitted as much, noting that Johnson right after the meeting "enlightened" him on the subject. As Johnson explained it in 1998, the idea of an "androgynous" mechanism had been bantered about in NASA conversations even before the meeting with Syromiatnikov. "…we used the term 'androgynous,' that is, no sex, no male, no female type of thing, which, see, the old probe and drogue was. So you couldn't have two male spacecraft or two female spacecraft docked. So we wanted something that was neuter, either one. And so we devised this thing – it's a hole with things around it that would get together this way instead of something going this way. We worked that thing." The American side, like the Soviet side, was "stunned" by the convergence of design, politics, and engineering, and Johnson recalled they "had no idea this thing would move so fast…And I almost dropped my teeth, you know."[31]

The simple idea, then, of an androgynous docking system was that two distinct systems could be docked without one having to be penetrated by the other. The "APAS" would have grabbing mechanisms attached to both objects to be docked, with a passageway created between them when they interlocked. The engineering and design of either object would not depend on the engineering and design of the object to which it would attach. Depending on the circumstance, one side could be the active partner (initiating the grabbing) and the other the passive partner in the docking (waiting for the embrace), but the roles could also be reversed. It was a hug in space. The design itself was both a clever solution to avoiding

29. Caldwell Johnson Presentation, Moscow, October 26, 1970, ARAN, f. 1678, o. 1, d. 108shch, ll. 43-53.

30. Interview with Caldwell Johnson, 1 April 1998, League City Texas, NASA Johnson Space Center Oral History Project, 24 https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm; October 26 Caldwell Johnson Presentation, Moscow, October 26, 1970, ARAN, f. 1678, o. 1, d. 108shch, ll. 43-53. Syromiatnikov's presentation that followed Johnson proposed the same concept as Johnson, though he did not yet call it "androgynous." ARAN, F. 1678, o. 1, d. 108shch, ll. 54-62.

31. Interview with Caldwell Johnson, 1 April 1998, League City Texas, NASA Johnson Space Center Oral History Project, 24-25; 27 April 1999, 58. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm

re-engineering the capsules of both sides so that they could dock, and an attempt to disarm the idea of sexual domination in the Cold War implied by previous "mama-papa" docking designs. In this way the basic docking system design for ASTP had been agreed upon, along with a description that distinguished it from the previous generation of "mama-papa" docking technologies both sides had used. By mid-1971 the mechanism was officially dubbed "androgynous," derived from the "androgyne" of Greek mythology. It was both functionally superior to the mama-papa design and also met the political demands of détente – a seamless blend, seemingly, of technology and politics.[32] Syromiatnikov would spend the next four years working with his American colleagues to develop the new system and translate it into a physical reality that ultimately became a universal interface and docking mechanism for space linkups all the way to the present day.

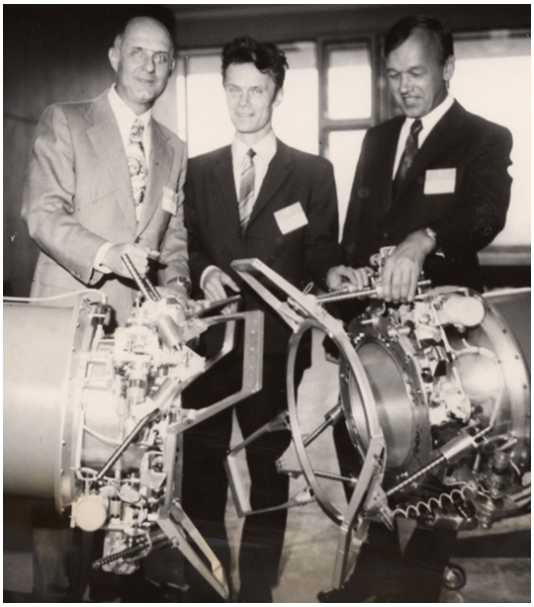

Figure 2: Thomas Stafford, Vladimir Syromiatnikov (in the center), and Aleksei Eliseev pose for a mockup of the androgynous docking mechanism

Syromiatnikov did admit that the "mating of identical parts, such as fire hose flanges or railway couplers," was not entirely novel. The design itself was a simple solution to a complex problem, like so many successful designs for functional objects and mechanisms. What made the approach unique was to apply it to the immensely more complex task of docking superpower rivals in space. "We were to connect two identical docking rings with a complex configuration, comprised of many different elements."[33] Syromiatnikov himself became obsessed with the idea of androgyneity, having just learned it from his American colleague in the October 1970 meeting. He named his dog "Apasik" and after the Soviet Union collapsed produced a line of vodka called Apasnaya, a play on the Russian word for dangerous "opasnaia," and trademarked the term "Androgynovka" for his vodka line. He incorporated androgyneity into his daily conversation after the "October Revolution" meeting, regaling two poor American women at a Houston party after a day of working on APAS "about androgynous creatures and structures that, according to the myths of ancient Greece, were miracle workers."[34] In his memoirs he described his thoughts after the October 1970 meeting:

32. Syromiatnikov, *100 Stories*, 418.

33.Vladimir Syromiatnikov, *100 Stories About Docking and Other Adventures in Space and On Earth* (Moscow: Universitetskaia kniga, 2005), 340.

34. Syromiatnikov, *100 Stories*, 400, 475.

> …the first meeting gave a strong impetus to new androgynous ideas… One way or another, my thoughts were preoccupied with androgynous configurations. Why had the androgynous configuration become so attractive?...Why had these ideas obsessed designers and pushed them to create a fully androgynous apparatus? Why, after the ASTP, were we still attached to these ideas, did we maintain our belief in them and even advance them to a new level? All these are good questions, as the Americans like to say. Surely, along with the subjective fancy attraction, there were good reasons for such persistence, especially since it wasn't that easy to realize the androgynous concept in practice. APAS turned out to be a hard nut to crack for us, its 'parents.' Indeed, there had to be good reasons, or again, as the Americans like to say, one had to feel strongly enough to take this kind of a long and difficult road. Even more so, since in both countries well-developed docking mechanisms had already been built and tested in space by that time. Later [Caldwell] Johnson used to joke, suggesting absolutely different reasons for the unwillingness of engineers to use probe-and-cone, or male-female, configurations: none of the countries wanted to play a female role in space before the eyes of the world. Who knows, maybe there was something to this. Later continuing with the joke, we started saying that with androgens, both partners are on top."[35]

These were ways of looking at engineering and its broader meaning that perhaps only a patriarchal culture could produce. (On the Soviet side all the engineers except one were male, which was true also of the American side.)[36] Vertical orientations during the Cold War were important in expressing dominance, and the aerospace age had produced many new ways to display domination over others from above: through spying cameras, rockets, satellites, lunar rovers, and flags on the moon. The goal of getting higher than the other side had fueled the space race and the quest for lunar bragging rights. The US seemed to win that battle for vertical superiority with the Apollo moon landings, but the Soviets countered with the successful Soviet moon missions beginning in September 1970. It was no accident that the Soviets felt prepared to work out a joint design for a docking project in October 1970, right after the Luna mission, since they now felt they had achieved the same vertical position over the Earth as the Americans. The successes of the Soviet Luna program, said an American space journalist in October 1970, "made it easier for the Russians to consider cooperation with the U.S."[37] The Soviets were also aware that their successes came just as the US was scaling back its ambitions in space, even as the US faced the humiliations of Vietnam and the energy crisis.[38] Meanwhile, the Soviets countered with the

35. Syromiatnikov, *100 Stories*, 395.
36. Syromiatnikov, *100 Stories*, 421-22.
37. "Space Cooperation?," *Christian Science Monitor*, 23 October 1970, p. 1.
38. Intercosmos report assessing scaled-back US ambitions in space and across the globe: ARAN, f. 1678, op. 1, d. 287, ll. 77-78.

Lunokhod 2 rover that landed on the Moon in January 1973, along with a Lenin bas-relief and Soviet coat of arms.

If the Cold War was fueled by the quest for vertical supremacy, having both sides join horizontally at the same altitude above Earth could just possibly end it, or so the engineers and politicians hoped. In the case of the ASTP, the two sides thus approached each other from the same altitude, replicating the meeting on the Elbe in World War II between Soviet and American allies and thereby establishing parity and reducing the focus on submission and domination. The horizontal coupling also marked the chronological dividing line between the earlier space race and the new era of space cooperation. This point was to be made explicitly in the 1973 Paris Air Show with a mock-up of the androgynous coupling. The plan for the joint exhibit – held outside of the country exhibits of the US and USSR in a spot exactly equidistant between the American and Soviet pavilions – was explicit that two capsules would be "situated horizontally in a docked position."[39] APAS was thus a way to engineer parity and to reduce the quest for domination in the US/USSR relationship – although with one important caveat that threatened to reignite Cold War competitive instincts.

Since the Soviets would often claim that the original idea for APAS was theirs, the American endorsement of the Soviet design suggested to some that the Soviet Union had imposed its will on the American side. Johnson, Syromiatnikov's American docking colleague, supported the Soviet claim of priority for the design even though he was aware that he would be criticized for "caving in" to the Soviets back in Houston, and that the American side had been contemplating something similar. He justified the decision as purely technical but understood the political subtext. "Even many years later," noted Syromiatnikov about Johnson, "he often referred to this decision and tried to explain the reasons for making it." It didn't help that Syromiatnikov began comparing himself – he was left-handed -- to the Russian "Levsha" (which means lefty and someone adept at the most finely skilled craftsmanship). The Levsha was a mythical figure in the time of Tsar Nicholas I who could make a horseshoe for a flea and in doing so proved that Russian engineers were superior to their European counterparts. He said he used the term to make a boring story more interesting, and that he did not mean to imply that he was superior to his foreign colleague and good friend, though he admitted he had, "added a witty design decision to optimize the future mechanism that eventually ensured the real international interface." Syromiatnikov also remembered that when his Soviet team came to Houston in the fall of 1973 to work on APAS, hordes of contractors and NASA engineers came visiting to view his docking design, "as if it was a Russian miracle." It was an echo of the docking simulations/shows back at OKB-1 NII-88 in the 1960s. Later, at a press conference after the docking on July 17, 1975, Boris Petrov, head of the Soviet Intercosmos, responded to a Western reporter's question about who invented the design. He answered that the design was primarily Soviet and mostly the idea of Syromiatnikov, who would be available at the next press conference to take

39. ARAN, f. 1678, op. 1, d. 294, ll. 25, 112

provide more details. When that conference occurred the next day, Syromiatnikov attempted to fudge his answer, but in a way that still made clear that he was the inventor: "I don't want to have another sleepless night, and therefore I will not say who personally designed the mechanism." Petrov immediately added: "The docking mechanism is the combined effort of specialists of two countries. It is an international child. And as an international child the child is androgynous." For the Americans it was some consolation that the Soviets ultimately adopted the American design for the latching parts of APAS. At any rate, Caldwell's willingness to let the Soviets claim priority for the androgynous design, despite the risks he took in doing so of making the Americans appear less clever than the Soviets, pleasantly surprised the Soviet side and helped to establish a friendly working environment, within a broader political context of detente, that was now tilting horizontally rather than vertically.[40]

One point of dispute in particular set the tone for further collaboration after the docking agreement was made: the issue of whether or not the androgynous clasping rings would have three or four "fingers" to grab each other. The Americans proposed four and the Soviets three. Johnson said the Soviets were suspicious of the American side and believed that the Americans would never give-in to the Soviet three-finger design, but he surprised the Soviets. As Johnson remembered it, the Soviet side came into the meeting to discuss the number of fingers issue and immediately said to the Americans: "We've decided it's a good idea for you to do it our way." Everyone then laughed and Johnson then did something completely unexpected: He agreed. "…it is very interesting, to have somebody ask you to do something, and you say okay, then they don't know what the hell to do. They wanted to fight, I guess."[41] Johnson's common sense, his willingness to take heat from some American colleagues and bosses, and his ability to leave his ego out of the collaboration played no small role in pushing the project forward. "You son of a bitch," he remembered some American colleagues saying after he gave in to Soviet demands. "You gave away. What did you give in to those bastards for?" But Johnson responded: "we want to get on with the program; we don't give a damn which way it is." It helped that both the Soviet and American engineers who worked together had immense respect for each other's technical capabilities. "The Russian team was first rate," remembered Johnson, who was mightily impressed by their engineering. "They were crackerjack engineers" and Syromiatnikov in

40. Syromiatnikov, *100 Stories*, 426-27, 454, 474; Transcript of ASTP mission communications, Part 5 (SR 61/2 - SR 83/1), Part 6 (SR 83/2 - SR 95/2), https://history.nasa.gov/astp/gallery.html. For Johnson's claim that the US first came up with the androgynous design: Interview with Caldwell Johnson, 1 April 1998, League City Texas, NASA Johnson Space Center Oral History Project, 25. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm In fact, as with many invention disputes, both sides seem to have come up with the design at more or less the same time as they headed into discussion for a joint docking project in October 1970.

41. Interview with Caldwell Johnson, 1 April 1998, League City Texas, NASA Johnson Space Center Oral History Project, 26-27. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm

particular was "brilliant."[42]

Johnson's respect for the Soviet engineers was only reinforced when he saw the impoverished conditions in which the Soviet space program operated. "[E] verywhere you went, you could see that they made do with things that we wouldn't make do with," noted Johnson, marveling at the Soviet accomplishments. "Their labs had wooden oil floors. The plaster was cracked on the walls. There were light bulbs hanging down on a cord that you reached up and turned the switch. You know, all their equipment was kid of crummy, crummy stuff. Now they made up for it with industry. They worked hard and [were] very conscientious people…They didn't spare themselves, you know. They were really dedicated." He remembered that the NASA teams brought gifts of IBM Selectric typewriters to replace "these old mechanical clunkers" that the Soviet secretaries used. "And they just – they just marveled at it." When the Soviet teams in the US first saw a Xerox machine, they were amazed. "Anybody just walks up and makes a copy?," they asked, and one wondered why they didn't just start copying dollar bills. "They were a great bunch, though."[43]

Interfaces and Foreplay

It is perhaps no accident that the Soviet side embraced the idea of APAS as an ideal techno-political design. It was a mechanical mirror of the idea of peaceful co-existence embraced by Khrushchev and Brezhnev in which the Soviets believed both sides could live in peace and interact with each other while still retaining their different socio-economic and political systems. In short, APAS was a technological manifestation of Soviet foreign policy, an example of "society made durable," to use the terminology of Bruno Latour. That was very different from the American conception of containment or the increasingly popular conception of "convergence" in some intellectual circles in both the West and the Soviet Union of the 1960s and 1970s. Convergence connoted the blending of systemic attributes to create something fundamentally new. Androgynous coupling, meanwhile, created a hybrid system that preserved the unique attributes of the separate systems while connecting them to each other and making them mutually accessible. The spirit of hybridity, as embodied by APAS, also explicitly rejected the guiding US policy of containment, designed by the first US ambassador to the Soviet Union George Kennan, who envisioned Soviet capitulation and assimilation to the American system through a policy of pressuring the Soviets economically and politically, thereby exposing the weaknesses of the Soviet system and forcing them to relinquish their own supposedly dysfunctional ideology in favor of capitalist democracy. Clearly distinct from the ideas of convergence and containment, the

42. Interview with Caldwell Johnson, 1 April 1998, League City Texas, NASA Johnson Space Center Oral History Project, 26-27; 27 April 1999, 59-61. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm

43. Interview with Caldwell Johnson, 27 April 1999, League City Texas, NASA Johnson Space Center Oral History Project, 62-63. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/JohnsonCC/johnsoncc.htm

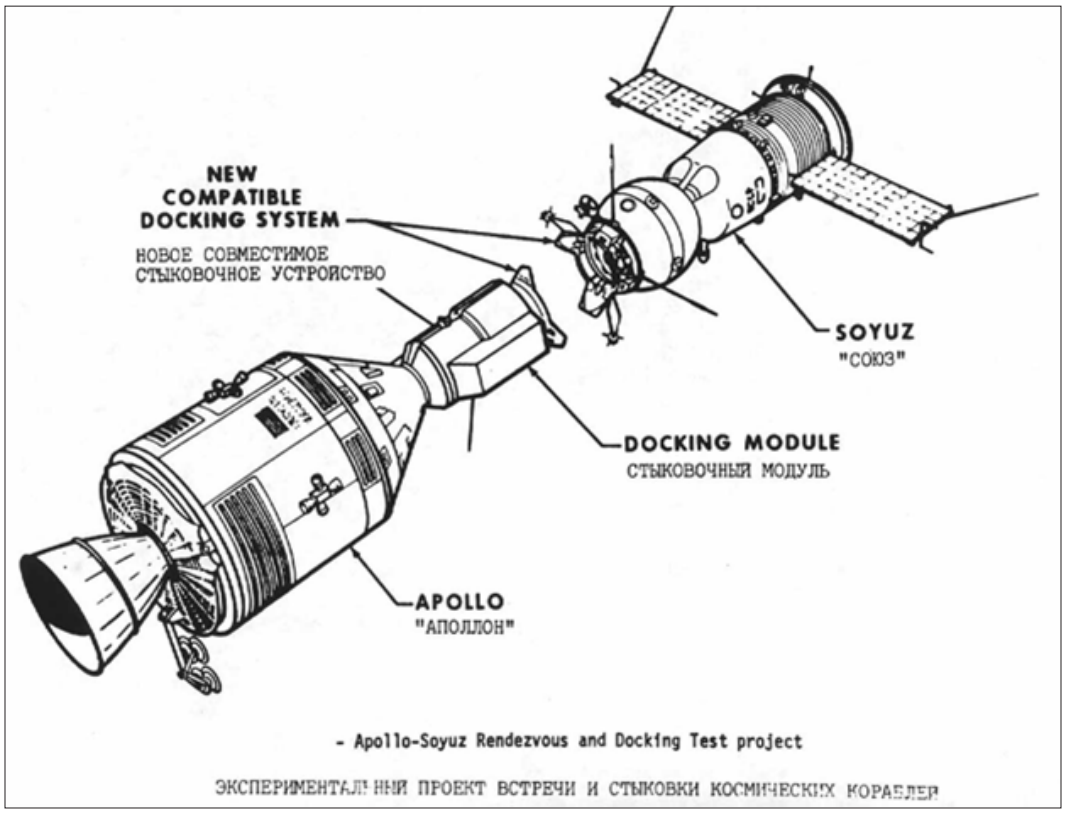

Figure 3: A Drawing of the docking system

docking mechanism of APAS thus embraced the spirit of "peaceful coexistence" (*mirnoe sosushchestvovanie*). This idea later was realized through a policy of Détente with the French in 1966 and with the U.S. in the early 1970s.[44]

Détente, like APAS, created interfaces (economic, technological, political, and cultural) that made both systems accessible to each other. Both sides recognized that to make this scheme work they needed to build a relationship of trust so that they would put aside the fear that mutual accessibility would lead to efforts by one side to sabotage the other side (through spying, theft of intellectual property, or other forms of political subterfuge). Central to the program of training leading up to the mission in July 1975 was thus a series of confidence building measures. Engineering working groups from both sides arranged joint meetings in both the Soviet Union and the United States. The technocratic spirit of problem-solving allowed both sides to meet in the supposedly neutral and non-ideological space of engineering. Feelings of mutual trust were to emerge from the progressive and joint solution of common problems in creating interfaces between the two distinct systems. The fact that the focus of collaboration was on the interface, and that there was minimal need to work together on fundamental capsule design issues, made it possible for country to produce its docking units on its own, "ensured by standardizing a minimal number of interfacing units," allowing both sides "the freedom…to use their own methods, concepts, and components." The experience

44. Brezhnev letter to Nixon, presented by the Soviet US Ambassador Anatolyi Dobrynin, August 5, 1971, Nixon Library and Archives, National Security Files, Henry A. Kissinger Office Files, NSC HAK, Country Files-Europe-U.S.S.R., Box 66.

of meeting to discuss progress, then retreating home to continue the docking system, and then returning again to report on progress, and finally docking, was immensely gratifying for the Soviet engineers. This was precisely the idea of détente as well – that neither side would impose its system on the other and both sides would recognize that there were multiple ways to approach the creation of a political and social system. The Soviet engineers, in particular developed a new vocabulary from their meetings with their American colleagues, starting with the very term "androgynous" that they used to name their docking design. The Soviet engineers, wrote Syromiatnikov, grew especially fond of the American word "interface…denoting inner, facing each other surfaces and other borders of two mediums." Like the word docking, interfacing became an almost higher calling in the context of ASTP that meant making incompatible things – objects, people, ideologies and systems -- suddenly compatible. The Soviets began to see interfaces everywhere. The Soviet Academy of Sciences, for example, had nothing to do with the development of Soviet space technology, yet it was designated as the primary interface with NASA because the Soviet space industry existed within the secret world of the Soviet military-industrial complex. The Academy of Sciences thus became the docking mechanism that permitted NASA to connect with the Soviet space industry. The Paris Air Show in 1973 became a public interface to the previously secret Soviet space industry, as the Soviets displayed a mock-up of the APAS to the world. The Soviets also constructed a new testing site for ASTP, outside of the normal testing sites deep within the secret Soviet military industrial complex, that they viewed as a simple solution – a "neutral zone" just like APAS -- to the problem of connecting secret worlds to open ones (the site later became the center for all testing of Soviet international missions and thus went from being a temporary interface for ASTP to the formerly secret Soviet space industry to a permanent one – once again, an illustration of Latour's idea of technology as "society made durable").[45]

Socializing before and especially after meetings was critical to trust building, as Soviet engineers were taken to Disney World and Disneyland – their interface with American culture -- during visits to Kennedy Space Center and at Rockwell facilities in Downey, California. Similarly, during their social interfaces on Soviet territory, American engineers were treated to the Russian traditions of hospitality (*gostepriimstvo*) which involved icebreakers with usually substantial quantities of food, drink and merriment. Cosmonauts were assigned the job of entertaining their colleagues: Aleksei Leonov, for example, was charged with taking the American crew hunting, while Vladimir Dzhanibekov, of the backup crew, was to host a party at his apartment.[46] At one banquet with his American colleagues, Syromiatnikov made a toast to APAS and their mission, playfully quoting Balzac: "Love begins with a touch."[47] The parties sometimes had a homoerotic quality. At a bash at the hotel Rossiya in the fall of 1973, for Caldwell Johnson's 50th birthday, the Soviets filled a 3-liter Samovar with vodka, took vodka in teacups,

45. Syromiatnikov, *100 Stories*, 429-30, 460-61, 532.
46. ARAN, f. 1678, op. 1, l. 14.
47. Syromiatnikov, *100 Stories*, 440.

Figure 4: The Soviets relax with Mickey Mouse at Disney World

and took pictures of each other holding long sausage.. "Our party was loud and completely male," wrote Syromiatnikov. Soon after, the Soviet engineers – without their secretaries – went to Houston for more testing and drinking to rejoin, as Syromiatnikov put it, "his androgynous brothers." There was a big party in Houston to honor the October Revolution in 1973 that included the American astronauts, as everyone drank from plastic cups and sang revolutionary songs. During a trip to Disneyland the middle-aged Soviet engineers "were just like teenagers." It, too, was an all-male affair. The one Soviet female engineer, who designed the seal for the docking mechanism, was not allowed to travel to the US with her male colleagues, just as the secretaries of the Soviet engineers were forced to stay in the Soviet Union. At a dinner later that evening, looking out over the Pacific Ocean, Syromiatnikov made a toast in which he mentioned his trip five years earlier to the Pacific Ocean in the Soviet Far East and proposed a toast to "pacifists." He had quite a bit of California wine and the best steak he had ever eaten, and before returning to the Soviet Union the Soviet engineers managed to squeeze in a trip to Vegas. Those experiences were among the personal benefits of interfacing with his American colleagues, along with the superior American toilet paper, which they brought back in large quantities to the Soviet Union in their suitcases. They also asked their American colleagues to bring them US toilet paper – another kind of interface with American culture -- for their visits to Soviet space facilities.[48]

Administrators from both programs, and especially cosmonauts and astronauts, frequently visited each other's facilities for training and technical meetings and each other's homes and families for socializing. These pre-flight social and business exchanges provided opportunities for confidence building

48. Syromiatnikov, *100 Stories*, 479, 481, 484, 515.

Figure 5: Aleksei Leonov on downtime from training in the US visits with the Shoshone after a Wyoming hunting trip

and a kind of dry rehearsal for the exchanges during the flight that in turn were crucial for the success of détente by proving that mutual accessibility would not pose a security threat to either side. By all accounts, the business and social meetings proved successful in achieving this goal, though there was some concern on the American side about succumbing to the seductive pleasures of Russian hospitality. In order to build trust and to avoid the impression that one side might owe something to the other side, the visiting side always paid for its travel expenses – something that sometimes conflicted with the Soviet cultural tradition of taking responsibility as a host for the needs of the guest. The American side feared that accepting Soviet hospitality expenses would potentially compromise their independence from the Soviet system.

The Mating

Right before the launch of Apollo on July 15, 1975, President Ford broadcast a message to both mission controls and crews. His message was careful to maintain parity by noting the feats of Yuri Gagarin and John Glenn as the first men to orbit Earth, of both Goddard and Tsiolkovsky as the fathers of modern rocketry, and of Apollo 11 and the Soviet Luna missions as great advances in lunar science and human exploration.[49] Mutual and peaceful accessibility to each other's geographical and political space was central to the carefully choreographed program of activities for the nearly two days of docking. Over the course of the docking four exchanges were planned, beginning with a first visit by American crew members to the Soviet capsule, and then three other exchanges, with the Soviets getting the all-important first visit. During these interactions, a crew member from the capsule's country would always be present in both capsules.

Figure 6: President Ford gets a briefing on the technology before the mission

Parity was to be achieved linguistically by having the crews speak in the native language of

49. Transcript of ASTP mission communications, Part 2 (MC 17/1 - MC 38/3), https://history.nasa.gov/astp/gallery.html.

the people they were speaking to. The Soviet crew thus spoke English to the American crew, and the American crew Russian to the Soviet crew (and both jokingly used the portmanteau "Rouston," for Russia and Houston). In this way the burden was on the native listener rather than the non-native talker to interpret words and act upon them. For example, Thomas Stafford in his thick Texas accent would use the Russian expression, "Kak po maslu," (like cutting through butter) to Leonov as an acknowledgment, and Leonov would respond: "OK" in English.[50] The point of the language protocols was to minimize the extent to which misinterpretation by the listener, leading to mission failure, might threaten the political goals of détente, not to mention the lives of both crew members. Listening rather than talking was thus put into a position of primary importance. In addition, the language training made each side aware of its vulnerability and mutual dependence by forcing the non-native speaker to confront – in halting, thickly accented, and grammatically imperfect words -- the humbling challenge of communicating to a native speaker. Built into the program was an escape plan – or to put it in sexual terms, a withdrawal of consent for mating -- should either system be endangered by the technical difficulties of the androgynous coupling.

The linkup itself, as one would expect, had to be carefully choreographed from a technical point of view. Joining together two capsules weighing nearly 60 thousand tons and travelling thousands of miles an hour was a dangerous and complex affair. While the docking itself constituted a formidable technological triumph, the act of docking was also integrated into the political agenda of detente. The docking was thus to occur at the point in which the two capsules were flying over the two Germanys – whose division had itself been a byproduct of the Cold War and the inability of two former allies to determine the exact conditions of peace for post-war Europe, as well as the terms and conditions under which the German aggressor should admit defeat. The linkup thus provided a kind of fresh start or redo, a turning back of the clock to a time before the Cold War was even imagined as an outcome of the WWII. Not for nothing did the Soviets – though much less so the US side – refer to the handshake in the capsule as the "Elbe in space," in reference to the handshake between US and Soviet forces on April 24, 1945.[51] Seen from the perspective of that moment when the Cold War did not yet exist the ASTP represented a return to a temporal and geographical space in which an open-ended future existed and Germany itself had not been divided by a wall built to separate East from West. In actual fact, the docking did not take place over the Elbe but apparently over Spain, though the Soviets noted that it was somewhere between Spain and the Soviet Union in the first post-meeting press conference. Ultimately, the myth of the Elbe fly-over for the docking was so compelling that the facts about where the docking actually occurred got sucked into the black hole of historical amnesia. In an interview on the 35th anniversary of ASTP Leonov continued to insist that the docking occurred over the Elbe, adding

50. Syromiatnikov, *100 Stories*, 564; " 'Soyuz-Apollon': nad El'boi," *Vesti.ru*, 15 July 2010, http://www.vesti.ru/article/2088534

51. Viktor Khokhlov, "Kuda khodiat mechty: razmyshleniia v godovshchinu kosmicheskogo iubileia," *Gefter*, March 23, 2015, http://gefter.ru/archive/14617.

Figure 7: The Soviet and American crews: Thomas Stafford, Vance Brand, Deke Slayton, Aleksei Leonov, and Vladimir Kubasov

for dramatic effect: "Thirty years before [the docking] our fathers and grandfathers shook hands on the Elbe and thirty years later we shook hands over the Elbe!" The newspaper editors took their cue from Leonov and titled the article: "Soyuz-Apollo: over the Elbe." [52]

The Objects of Peace and the Exchange of Gifts

Both sides used the transport of items into space to commemorate the flight as an opportunity to express the goals of equalization. The list itself of items, hashed out through agreements and conversations between the two sides over a number of years, was itself designed to produce a hybrid inventory of symbols and ceremonial objects. Especially important was the symbolic space occupied by national flags. Ever since the placement of the US flag on the moon, the nationalization of space had been a key way for the US to express its imperial ambitions. That approach nonetheless offended many, as evidenced by the many letters sent to Nixon declaring that the planting of the flag was a violation of the spirt of internationalism and peace that should govern space exploration. In this instance, space was imagined as a process of double but equal colonization by the US and the USSR. The crews would thus exchange five flags with each other, including five small US flags (8" x 12", measured in the US system of inches) to be exchanged for five small USSR flags (205mm. x 410mm, measured in the Soviet

52. Transcript of ASTP mission communications, Part 5 (SR 61/2 - SR 83/1), Part 6 (SR 83/2 - SR 95/2)
https://history.nasa.gov/astp/gallery.html; " 'Soyuz-Apollon': nad El'boi," *Vesti.ru*, 15 July 2010, http://www.vesti.ru/article/2088534

metric system). The flags "symbolized the contribution made by a great many people from all over the United States and the Soviet Union. Such contributions were essential to the first major joint venture by these two spacefaring countries."[53]

While celebrating the flight as a process of managed competitive colonialism – perhaps similar in some ways to the 1885 Berlin agreement between European powers that attempted to set ground rules for European imperialist takeovers of Africa – the two sides also imagined the docking as the expression a transnational project devoted to the advance of all humanity, in line with the increasing view of space exploration as a transnational enterprise. The Soviets would thus carry into space a United Nations Flag (3' x 5', and the biggest of the flags), that would then descend back to Earth on the Apollo capsule, "symbolizing our common goal of peacefully exploring space for the benefit of people all over the world and in recognition of the contribution to this and other cooperative space projects made by people from many nations." An additional set of flags went into space but would not be exchanged in order "to symbolize [the role of each nation] in the first international flight.[54]

The two sides also carried separate pieces of commemorative plaques to be assembled jointly in space. The plaques, representing "two permanent symbols of the first international human spaceflight," formed two individual medallions with crossed flags and docked spacecraft. While the commemorative plaques celebrated the spirit of international cooperation, other objects expressed the related spirit of ecological consciousness, which was itself a byproduct, in large part, of the view from space. The US offered white spruce seeds to the Soviets, who returned the favor with seeds of native trees, so as to create a "living and growing monument to the first cooperative human spaceflight." The seeds celebrated the new space-age environmentalism, "the product of new scientific developments in forestry" that would "call attention to the new awareness of Earth brought by spaceflight. Perception of the planet from space heightens humankind's appreciation of Earth's natural beauty and our understanding that we all share responsibility for its preservation." The principle of parity was maintained by selecting seeds from trees in Rhinelander in the state of Michigan, which was determined to be most similar to the climate of Moscow.[55]

There were more silver medallions presented to individual crew members and a certificate of docking from the International Aeronautical Federation (Federation Aeronautique International-FAI), which had certified aerospace achievements since its formation in since 1905. The flight also paid homage to the politics of détente for which the entire project had been a test. There were six copies of the May 1972 Nixon-Kosygin Agreement, "concerning cooperation in

53. https://history.nasa.gov/astp/documents/Objects%20Exchanged.pdf

54. One large US flag, 3' x 5', and five small US flags, 8" x 12," and one large USSR flag, 3' x 6', and five small USSR flags, 205mm. x 410mm. https://history.nasa.gov/astp/documents/Objects%20Exchanged.pdf

55. https://history.nasa.gov/astp/documents/Objects%20Exchanged.pdf; Transcript of ASTP mission communications, Part 10 (MC 148/2 - MC 166/1)
https://history.nasa.gov/astp/gallery.html.

the exploration and use of outer space for peaceful purposes (three in English and three in Russian), by which both nations made a commitment to conduct not only the Apollo-Soyuz Test Project, but also a wide range of continuing cooperative activities in such fields as space meteorology, the study of the natural environment from space, the exploration of near-Earth space, the Moon, the planets, and space biology and medicine."[56]

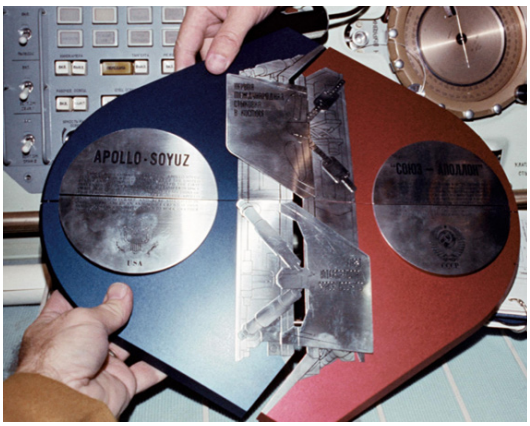

Figure 8: The Commemorative Plaques Joined During the Mission

While the idea of androgynous docking mechanism set the tone for a project that aimed to treat both sides in the same manner and to preserve the distinctiveness of both cultures and systems, there was one aspect of the symbolic program that pointed toward a joining together that would be not one or the other, but an amalgam of the two into something new. This was the test to produce a lead-gold alloy (three samples) in the electric furnace of the docking module. The project was a Soviet idea that originated with visions of space as an arena for industrial activity. Kubasov, Leonov's Soviet ASTP crew, had gone down in space record books on October 11,1969, as the first human to weld in space. The notion of building upon this feat and creating a blast furnace in space seemed somehow logical to the Soviet side, and the Americans indulged their crewmates, as all happy couples often do with their partners. Said the joint planning documents: "The uniform mixing of unlike materials in space created a new substance that symbolized the success people and nations found in putting aside their differences to work together in space. *The unusual environment of space acts as a catalyst through which both men and materials may combine to yield useful applications for the benefit of all."*[57] As one Russian scholar has noted, the docking mechanism of ASTP was like the androgyne figure of the alchemical traditions of early and medieval Christianity. It involved, "the union of irreconcilable elements, the merging of opposites," which "not only gives birth to the sought-after philosopher's stone, but also helps to achieve universal wisdom and eternal intellectual enlightenment."[58] Kubasov described the meaning of the welding experiment to global television audiences during the mission: "It seems to me that some time will pass, and mankind will have many new metals, many new alloys, with new qualities - we'll be obtaining these materials in conditions which could never be created on the Earth, but which could be available only in space. And it seems to me, that the time will come when space will have whole plants, factories, for the production of new materials and new substances with new qualities, which could be obtained or made only in space."[59]

56. https://history.nasa.gov/astp/documents/Objects%20Exchanged.pdf
57. https://history.nasa.gov/astp/documents/Objects%20Exchanged.pdf
58. Natalya Serkova, World Wide Gold, e-flux, no. 93 (2018) https://www.e-flux.com/journal/93/213267/world-wide-gold/
59. Transcript of ASTP mission communications, Part 18 (MC 272/1 - MC 285/2)

The Return to Zero-Sum Back on Earth

Despite the goal of equalizing power relations between the two sides, the game of one-upmanship continued through the years of contacts and joint development. These incidents, the subject of this essay's final section, provide important reminders about the limitations of technological fixes. The attitudes that produced the Cold War, it turns out, were unusually resistant to the amalgamating forces of blast furnaces in space.

There were many such incidents over critical but also seemingly trivial issues that represented, on the part of both sides, an instinctual and at times conscious resistance to the goal of escaping from the zero-sum politics of the Cold War. For example, both sides accused the other of having more dangerous and less secure technology. The Soviets noted the dangers associated with the American reliance on pure oxygen, which had already resulted in the incineration of the Apollo 1 crew in 1967. Meanwhile, the Soviet mission control director Mozzhorin took umbrage at American arrogance: "In the Apollo-Soyuz program the Americans openly expressed their lack of confidence and safety in the functioning of our space technology and systems and expressed the fear that this represented a serious threat to their astronauts during docking and the joint flight of the capsules. That opinion was widely disseminated in their press."[60] Their pride wounded by American disdain, the Soviets redoubled efforts to update their mission control and to prove to the American side that their technology was every bit as good as the American technology, perhaps even better. "In general, our mission control made a good impression on the Americans," wrote the Soviet mission control director, Mozzhorin, in his memoirs. "Yours is as good as ours," said NASA's Fletcher, as quoted by Mozzhorin, in defense against the claim among many Americans that the Soviet technology was inferior.[61] The Soviet flight director Eliseev went further, bragging that, "functionally our mission control was no worse than the American mission control, and in terms of comfort exceeded it," including a better buffet, rest areas, and accommodations for guests. The Soviet leadership spared no expense in keeping the buffet well stocked with the best food, realizing that national pride and the traditions of Russian hospitality were at stake. "It might seem strange now," Eliseev wrote many years later, "but otherwise we would have been ashamed before the Americans."[62]

60. N. A. Anfimov, ed., *Tak eto bylo…: Memuary Iu. A. Mozzhorina: Mozzhorin v vospominaniiakh sovremennikov* (Moscow: OAO 'Mezhdunarodnaia programma obrazovaniia, 2000).http://epizodsspace.airbase.ru/bibl/mozjorin/tak/06.html, this is chapter 6. June 12, 2018.

61. "Istoriia TsUPa: Trud, radosti, mytarstva," *Nauka i zhizn'*, No. 8, 2005, http://epizodsspace.airbase.ru/bibl/n_i_j/2005/7/istoria-tsupa.html, downloaded June 11, 2018. Syromiatnkikov disliked NASA's administrator Fletcher because of his disdain for Soviet technology and thought George Low, who respected Soviet technology, was far more qualified. Vladimir Syromiatnikov, *100 Stories,* 558.

62. "Istoriia TsUPa: Trud, radosti, mytarstva," *Nauka i zhizn'*, No. 8, 2005, http://epizodsspace.airbase.ru/bibl/n_i_j/2005/7/istoria-tsupa.html, downloaded June 11, 2018

Sometimes, the advantage of one side was equalized by the advantage of another. So while the Soviets were superior to the Americans in terms of ground control of the orbiting capsules, the Americans allowed their astronauts more manual control. Mozzhorin recalled another episode that illustrated the challenges of equalizing power relations between the two sides. To accommodate NASA observers, the Soviets built a three-story hotel next to their new mission control center for the flight where NASA observers could work during the mission. The rooms were outfitted "with nice imported furniture." Mozzhorin had been charged with ensuring the Americans received all the information they required and in the most comfortable circumstances. And then Mozzhorin was contacted by the KGB and the Soviet Foreign Ministry, who informed him that "there was an order to observe the principle of parity" and that the Soviets had violated that order – not by failing to create living conditions for Americans equal to the Soviet side but because the Soviet arrangements for the Americans were far superior to those the Americans had provided to Soviet observers in Houston mission control. In Houston NASA had provided "spartan conditions" for the Soviet observers and engineers; there was no place for them to lie down in mission control and getting access to decent hotel rooms and food was difficult. The Americans had failed to match the Soviet provision of hospitality and so the Soviets closed the hotel for American observers (it was later turned into offices for Soviet space officials and engineers) and set out "domestically manufactured" Soviet chairs and couches for the American observers. Interestingly, the American side seemed to not take offense, "and to the very end our mutual work was not hindered in the least."[63]

The question for parity could often take a comical turn. Caldwell Johnson remembered that during one visit to Leningrad, which was notorious for having Giardia bacteria that causes severe intestinal infection, the American engineers suffered debilitating diarrhea. When they complained, their Soviet hosts said: "Nonsense. Nothing wrong with the water in Leningrad. You brought this [problem] with you." Parity was achieved when Soviet engineers came to the US and stayed in a motel. The Soviets, remembered the docking engineer Johnson, "… were walking around barefoot and taking showers in the stalls, and they all came down with absolutely the worst cases of athlete's foot you've ever seen. We've got a whole bunch of little viruses that the Russians don't have any protection against." When the Soviets complained, the Americans told them: "Nonsense. You brought it with you." The NASA doctors did take pity on them and gave them a powerful ointment that "just smelled awful, and you could tell these guys a mile away."[64]

The stakes in maintaining parity rose considerably for the all-important and much-anticipated meeting of the two crews. As Eliseev remembered it, the Soviets constructed a joint plan of the mission that would make the first meeting between the two crews take place in the Soviet capsule, which he considered a

63. "Istoriia TsUPa: Trud, radosti, mytarstva," *Nauka i zhizn'*, No. 8, 2005, http://epizodsspace.airbase.ru/bibl/n_i_j/2005/7/istoria-tsupa.html, downloaded June 11, 2018

64. Interview with Caldwell Johnson, 1 April 1998, League City Texas, NASA Johnson Space Center Oral History Project, 27-28.

coup. The American side had apparently not been paying close enough attention, and by the time they objected to the arrangement it was already too late to change the sequence of crew activities. The moment then arrived as the Soviet ship awaited its American guests. "Everyone had the feeling as if right before our eyes there was occurring a transition from dangerous confrontation to friendly collaboration." Eliseev recalled that the embraces, joy, and sheer excitement of the moment overshadowed the reading of the comments completely, and that what remained was the memory of the exchange of flags and other commemorative items. It was only later, upon reviewing the video of the scene, that he noticed something he had not first seen: When the hatch opened, the American crew held back from entering the Soviet capsule and instead insisted on inviting the Soviet crew into the area of docking module, thus attempting to change the plan from a meeting in Soviet territory to the neutral territory of the APAS module between the two capsules. "The cosmonauts did not take the bait. Their patriotic feelings were no less developed than those of the Americans."[65]

The confusion of that moment is reflected also in the mission transcripts. Slayton and Stafford were clearly hesitating to enter the Soyuz capsule. A mission control operator then told them: "You're supposed to go into the Soyuz." Leonov reiterated after this: "Come in here and shake hands. Our viewers are here. Come here please." It appears from the one grainy photo of the event – it is curious that a ceremony that had been so hotly anticipated was so poorly documented visually – that Stafford stayed in the module, thus refusing Leonov's entreaties. In this photograph Leonov seems to have made sure that the handshake could not take place across the threshold of the Soyuz capsule entrance and thus thrust his arm and hand into the docking module where Stafford grabbed it and the picture was taken (shaking hands across a threshold of a door is strictly forbidden in Russian culture and a harbinger of very bad luck). Stafford then apparently entered the Soviet capsule, having maintained the handshake on the neutral territory of the APAS docking module. Just to make things even more confusing, the Soviets later claimed the handshake had taken place in their capsule. At any rate, the impression from the transcripts of that meeting is that confusion reigned despite all the planning and scripting, and that there was plenty of room to spin the events after the fact.[66] Leonov, a notorious story teller, embellished even more years later. He claimed that the meeting had actually occurred while the Soviet crew was out of communication with mission control, and when they got back into communication with mission control in Moscow, the operators on the ground instructed them to open the hatch and let the Americans in, to which Leonov said: "Why? They're already here sitting with us!" A long and awkward moment of silence followed, according to Leonov, and finally mission control asked how the meeting went, and then everyone broke out in applause.[67]

65. A. S. Eliseev, *Kaplia v more* (Moscow: Aviatsiia i kosmonavtika, 1998), 107-108.

66. Transcript of ASTP mission communications, Part 5 (SR 61/2 - SR 83/1), https://history.nasa.gov/astp/gallery.html.

67. " 'Soyuz-Apollon': nad El'boi," *Vesti.ru*, 15 July 2010, http://www.vesti.ru/article/2088534.

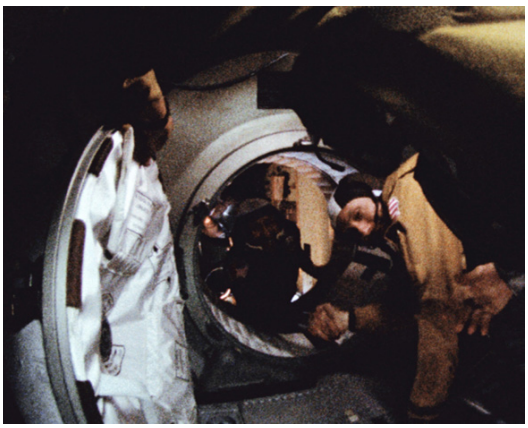

Figure 9: The Handshake in Space

The confusion continued as the two crews exchanged the gifts – awkward laughter, cameras in the wrong position, noise clicks from unknown sources of interference, dropped audio and video. And then they proceeded to eat the tubed and pouched dishes from both countries that included borshcht, steak, turkey and cranberries, dark Russian bread, and many other items. For the first breaking of bread between the crews Leonov brought out tubes for his American colleagues with labels from Soviet vodkas that read "Stolichnaia," "Russkaia Vodka," and "Staraia Vodka," and then said they had to drink before eating. "It is a very big Russian tradition," he added, claiming that for a moment the Americans actually believed he was serious. The tubes contained Borshcht soup.[68]

Figure 10: Thomas Stafford and Deke Slayton hold the tubes of borshcht with Soviet vodka labels

The second day was filled with exchanges and meals in both capsules, as well as television events in which the cosmonauts and astronauts would make comments on the each other's space food, and then conduct of a variety of experiments and more ceremonies. Over the course of the mission live television broadcasts from the docked capsules concentrated on the crews describing their meals and playing tour guide for global television audiences as they discussed the territories below

68. " 'Soyuz-Apollon': nad El'boi," *Vesti.ru*, 15 July 2010, http://www.vesti.ru/article/2088534.

them. After the second day the crews seemed to warm to the idea of sharing each other's space and relaxing in each other's company. Viewers witnessed men at work and play engaged in homosocial bonding and declaring how much they really liked being around each other. One of the most striking features of this socio-technical imaginary of global peace was the complete absence of women. It was an all-male world, designed and operated almost exclusively by men, with a supporting cast of women as secretaries unseen in the background, mediated by a mechanical androgyne.[69] Perhaps the Americans and the Soviets had achieved parity relative to each other, but they also joined together over the rest of the world in a position of vertical dominance, commenting upon and gazing down upon all the other nations who had not achieved their superior vantage point. Linked together by global relay stations, both the Soyuz and Apollo capsules travelled over the entire globe in just hours, tracking weather and transmissions and commenting upon the geographical domains over which they now flew – over and over again, armed with the vertical gaze as masters of the Earth. Perhaps, in the end, they could come together more like equals precisely because they shared a feeling of superiority over everyone else.

Parity was also difficult to maintain because of the technological and physical differences between the two capsules and space systems. "In the course of the whole project Apollo was the favorite," remembered Syromiatnikov. "It was bigger, heavier, and 'smarter' than its partner was, since at that time we were not able to provide the Soyuz with an onboard computer. During the flight, when performing joint operations, Apollo had to be much more active."[70] The Apollo capsule was visibly bigger than the Soviet capsule, and it had a crew of three, as opposed to the crew of two for the Soyuz.[71] The mere fact that one word had to come before another in describing the mission automatically also violated the quest for parity. The Americans thus called the mission "Apollo-Soyuz" while the Soviets called it "Soyuz-Apollon." The emblem attempted to overcome this problem by putting the words Soyuz and Apollo on the edge of a circular patch.

The act of docking, despite the androgynous mechanism, also had to be choreographed to preserve equal relations. During the mission there were actually two docking procedures – a plan that was designed to maintain the all-important focus on parity. Among the planned events was the initial docking, followed by the exchanges of crews, and a later de-coupling and re-docking before the ending of the mission. For the first docking the Americans had played the active role of maneuvering the ship to join the coupling mechanism to the Soviet capsule, which played the passive role (though their capsule, as noted earlier, got to host the first crew exchange). In anthropomorphic terms, the Americans initiated the hug. Who would be the passive or active partner, as one might expect, became a matter of some dispute in the initial discussions. As Syromiatnikov noted: "The bigger

69. Transcript of ASTP mission communications, Part 14 (MC 208/4 - MC 224/1), Part 15 (MC 225/1 - MC 244/2), https://history.nasa.gov/astp/gallery.html.

70. Vladimir Syromiatnikov, *100 Stories About Docking and Other Adventures in Space and On Earth* (Moscow: Universitetskaia kniga, 2005), 394.

71. Syromiatnikov, *100 Stories,* 417.

the prestige factor, the less room there is for reason."[72] In the second coupling the roles were reversed as the Soviet capsule played the active role – the hugger initiator -- and the Apollo the passive role. The docking at first went according to plan as the Soviet capsule maneuvered its way to connect with the Apollo capsule. But then the Soviet side felt two forceful jolts from the American capsule, and it had become clear, to use Stafford's favorite term, that the docking was not going "kak po maslu". A moment of panic ensued, since the force of the impact could have been enough to cause a catastrophic failure, though the Soviet flight engineer noted that "the strength of [Soviet] construction saved the mission." The Soviets realized that during the docking the American side had gone from being passive to active by incorrectly turning on side jet thrusters – a maneuver that was strictly forbidden in the instruction manual. After the flight the two sides discussed the incident and at first the American side categorically denied that its thrusters had been turned on, but an examination of the telemetry indicated that they had been turned on by mistake. "We left this incident on the conscience of the American side," said the Soviet flight engineer Eliseev, although Syromiatnikov later remembered that the Soviet side was not entirely blameless. The incident itself impressed the Soviets, not only because of the possibly tragic consequences of the mistake, but also because it seemed to represent a blatant American violation of the principle of parity – planned or by mistake. They had gone into active mode without Soviet permission. To make matters worse, the American side denied, according to the Soviets, that they were even responsible for the incident until confronted with incontrovertible evidence from the telemetry data.[73] It was a reminder that the engineering of parity, like the goal of eliminating zero-sum politics from Soviet-American relations, could suffer catastrophic failure in a moment's notice. The transcripts of the mission communications do not reveal any reactions or comments to the event, but the press did learn of a "hard docking" and asked a question the following day at a press conference about its cause and whether or not the cosmonauts had any reaction and were fearful or anxious at the time. The answer was no, they did not react verbally, and that Syromiatnikov would be getting together with his American colleagues later to discuss what had happened. More information would be made public as soon as it became available. And that was it.[74] Ultimately, both sides agreed to divert attention away from the incident in the interests of diminishing chances for post-flight controversies, and the unpermitted American thrust was forgotten.

The Message Gets Lost

Try as they might, both sides were often unable to communicate the central idea of parity that the mission was designed to convey, especially in the United States. In the US context, the dominant narrative was one of being "screwed" –

72. Syromiatnikov, *100 Stories*, 547.

73. A. S. Eliseev, *Kaplia v more* (Moscow: Aviatsiia i kosmonavtika, 1998), 110; Syromiatnikov, *100 Stories*, 575, 582.

74. Transcript of ASTP mission communications, Part 11 (SR 147/1 - SR 156/2), https://history.nasa.gov/astp/gallery.html.

quite literally -- by the Soviets. That story line began with the leadup to ASTP and in the years that followed, but was perhaps best illustrated in the December 1975 issue of *Playboy*. The magazine ran a story with accompanying images that expressed in graphic and explicit terms a common zero-sum view of American-Soviet relations that ultimately hastened the demise of detente. The article was part of a special section presented in the style of *National Geographic* magazine called *National Pornographic* (the "journal of the National Pornographic Society.") The ASTP image is across from one page with an article titled, "Mysterious Insects Battle for Survival," which shows a number of insects mounted on other insects during mating. The ASTP article is titled: "Historic Emission in Space." It contains two distinct images: one of a mock-up of the capsules which is not even remotely close to the appearance of the Apollo and Soyuz capsules. The caption of their docking reads: "US crew sends message to Soviet craft: 'Is it in yet?'" The other shows a naked man mounting a naked woman from behind and on top. The man is the Soviet Union, while the woman is the United States. The caption reads: "East meets West in the vast, weightless reaches of outer space. Soviet cosmonaut radios, 'My bird has landed!' while pretty U.S. astronaut muses aloud: 'I wonder why this reminds me of the U.S. Soviet grain deal.'"[75]

Of course, the article and associated images were intended to amuse, but they also reflected an increasingly anti-Soviet position that fueled opposition to détente and give rise to a renewed Cold War under Presidents Carter and Reagan. If Syromiatnikov had worked painstakingly to engineer the flight in a way that would remove the implication that one side, the male, was dominating the other, the female, that message was completely lost on much of the American public. In the *Playboy* issue, and in a good portion of the anti-Soviet press in the United States, ASTP was interpreted as a dangerous give-away of American technological superiority that also had put the US into a vulnerable position: in this case, the US had literally been taken from behind by the Soviets. The reference to the grain deal – a controversial taxpayer subsidized sale of US grain to the Soviets as part of détente that was widely panned as a give-away to the communist enemy – reinforced the connection between the flight and American humiliation. It was a stark reminder of the difficulty of changing political culture from a zero-sum mentality in the Cold War to a win-win proposition. Even more, the purposeful design of androgynous docking latches that would obviate the need for a "mama-papa" docking was completely ignored in favor of the narrative of domination and subordination – exactly the opposite of the intent. The *Playboy* article noted, deploying sophomoric sexual innuendo appropriate for the magazine's audience: "The first coupling in outer space was a fitting climax to the joint venture undertaken by the United States and Red Russia. Commie space technicians successfully completed docking maneuvers by inserting their vehicle into the opening of the American module, although NASA officials had insisted that the Bolshevik vehicle be provided with a heat-resistant sheath (painted bright red, of course) – for the prevention of disease only. Inside the U. S. capsule, cosmonaut and astronaut

75. "Historic Emission in Space," *Playboy*, December 22, 1975, 209.

Figure 11: The Soviet satirical magazine Krokodil in July 1975 clearly conveys the political challenge of engineering: the goal of the docking mechanism was to destroy the military spirit of the Cold War.

joined in a historic embrace that will be remembered as one giant *shtup* for mankind."[76] The article diverged not at all from the standard conceptions in American culture of communism as invasive and aggressive in its violation of American space – first with the penetration of the vehicle and then of the sex act, which takes place in the American capsule. It was something that Syromiatnikov had noticed much more toward the end of his ASTP collaboration when he visited the United States in 1974. He noted the virulent anti-Soviet and anti-détente attitudes during his last visit to the US, which surprised and saddened him, especially in light of the popularity of détente back in the Soviet Union and how much the hostility contrasted to the much more welcoming atmosphere of 1972 and 1973. Reflecting the contrast in attitudes, one of the most popular magazine images of ASTP was in the Soviet satirical journal *Krokodil*.[77] Its July 1975 issue had a cover which showed the two capsules meeting together over earth. As the androgynous docking latches come together over Earth they squeezed the mid section and groin of a Trojan Warrior, who is forced to drop his sword. The warrior is labeled "Cold War." The representations of the capsules clearly convey the androgynous docking mechanism in which neither side penetrates the other and in which the end result of the non-penetrating docking is peace. The contrast between the *Krokodil* and *Playboy* images says much about the very different public attitudes that framed the Cold War and echo the often bellicose and aggressive posture of the US in comparison to the Soviet Union.

The end of détente was asserted in space through Reagan's 1983 Strategic Defense Initiative. While Nixon started his presidency with the idea of space collaboration, Reagan began his with remilitarization and a renewed attempt to shift from a horizontal and back toward a vertical orientation in American-Soviet relations. Gaining a position above your enemy, with a laser shield, would produce a kind of erectile dysfunction in the Soviet Union's arsenal. In short, the

76. "Historic Emission in Space," *Playboy*, December 22, 1975, 209.
77. Syromiatnikov, *100 Stories*, 515; *Krokodil*, July 21, 1975.

engineering of androgyneity could not transcend the patriarchal ideas that drove international relations. Cold War politics in the United States were broken in a way that technology was unable to fix.

About the Author

Dr. Andrew Jenks is a Professor of History at California State University, Long Beach. He is an editor of *Kritika: Explorations in Russian and Eurasian History* and author of books on Palekh lacquer-box art, technological disasters, Yuri Gagarin, and most recently (which includes material from this article): *Collaboration in Space and the Search for Peace on Earth* (Anthem Press, November 2021). He is now working on a project about Russian immigrants to Mexico and California.