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SPACE-AGE EUROPE, 1957-1980

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"Europe will be made in space . . . or not at all!"

Orio Giarini

"Il ne faut pas espérer pour entreprendre ni réussir pour persévérer."

William the Silent

Soon after the Soviet *Sputnik* opened the frontier of outer space, European scientists, industrialists, and politicians began to clamor for rapid entry into the space age by Europe, the cradle of modern technology. It took 22 years before the European Space Agency (ESA), on Christmas Eve 1979, finally achieved successful orbit of a European-designed spacecraft riding on a European booster, the Ariane, from its equatorial spaceport in French Guiana. The launch was beamed live (via the American-built Intelsat IV communications satellite) to French television. But the viewers—and the newsmen themselves—were so unused to such affairs that each time the countdown went on another "hold" they reacted hysterically as if the whole program were about to be cancelled. This calls to mind another anecdote from a friend who watched the coverage of the first Moon landing in 1969 in the company of a peasant family in the South of France. They were curiously blasé about the whole affair—until the report that President Nixon was about to converse with the astronauts on the Moon. Madame excitedly called the family to watch: "Look! The President of the United States, he is going to telephone the Moon . . . and we cannot even get a line to Paris!"

In these vignettes are illustrated essential themes in the first chapter of space-age Europe: tardy and hesitant enthusiasm, a certain naïveté, and public apathy to events that do not impinge on quotidian reality. In tired Europe, the age of adventure sometimes seems closed, but it is perhaps enough that there is a European chapter in space at all. In fact, the response of the major states to the challenges of *Sputnik* and *Apollo* reflect their very adjustment to the postwar world itself, a world in which the old continent struggles to find its proper place amidst superpower hegemony, decolonization, welfare statism, fitful integration, and, above all, perpetual technological revolution.

The first European implications of *Sputnik* were military. Now that the Soviets demonstrated an intercontinental ballistic missile capability to threaten the American homeland, was the U.S. nuclear deterrent still credible? Would America risk New York or Chicago to save Berlin or

Paris? And if not, could second-rank powers like Britain or France see to their own defense? Only six months after *Sputnik*, Charles DeGaulle was called out of retirement to lead a nation smarting from Dien Bien Phu, Suez, and Algeria. His "*certainie idee*" of a glorious France rested not only on rhetoric, but on a vision of technological self-sufficiency in defense and industry. In five years, French R&D spending increased four-fold, yielding a vigorous nuclear power program, an independent strategic deterrent, and the world's space program. Benefiting from its country's military missile research, the French space agency "cut" a series of precious stones—rockets called the Agate, Topaze, Rubis—until in 1965, a Diamant launcher lifted a French satellite into orbit from the Sahara desert test range. There also followed the deployment of land- and submarine-based missiles, the *Force de Frappe*, and in our own day, the beginnings of a military space program.

The French could not hope to match the space and missile efforts of the U.S. and USSR. But that was never their intent. Militarily, the French relied on the crude "city-busting" deterrence of the mutual-assured-destruction doctrine. In terms of general technology, they envisioned a world of multipolar competition in which Europe would evolve away from both Cold War camps. What was important, therefore, was that France assure herself the position of first among European equals. The French space program would help to establish French primacy in the European community.

The British, on the other hand, reacted to *Sputnik* by throwing in the towel. Their V-bomber force would soon be obsolete, but they abandoned their missile effort and resigned themselves to dependence on their "special relationship" with the U.S.—the relationship that DeGaulle so despised. But lest their first-generation intermediate-range ballistic missile go to waste, the British offered the rocket, the Blue Streak, to Europe as a whole, to serve as the first stage of a European space booster. Meanwhile, an international committee of scientists organized by Pierre Auger lobbied governments on behalf of a space science program. From these two early initiatives the European space program emerged, dedicated to admitting European science and industry to this latest and most exciting human enterprise.

It seemed like a good idea at the time. France, Italy, West Germany, and the Benelux countries had just formed the Common Market and EURATOM. A cooperative space effort was a logical step. Moreover, the vast expense involved suggested the pooling of resources. So in the early 1960s, the European Space Research Organization (ESRO) and the European Launch Development Organization (ELDO) were born. The two

agencies became embarrassing examples of how *not* to generate high technology.

ESRO's member countries* proposed to design payloads for satellites to be launched by NASA and eventually by ELDO. But thanks to organizational problems, inexperience, and underfunding, it was not until 1967 that the experimental ESRO 1 was in orbit. By that time Britain and Italy were already pleading straitened finances while all member governments were goading ESRO to deemphasize science in favor of commercial applications satellites with benefits perceptible to parliaments and publics. ESRO founded some impressive facilities in its early years, e.g., the spacecraft design laboratory at Noordwijk, Netherlands; a European space operations center in Darmstadt, West Germany; ground stations in Spain, Belgium, and Italy; and a sounding rocket range in Kiruna, Sweden—but there were endless startup problems associated with them. Discord also stemmed from disproportional distribution of contracts to the member states, the problem of *juste retour*. France, for instance, received a percentage of ESRO contracts twice the level of her contributions, and less favored nations complained that such practice only perpetuated their industrial inferiority. This pointed up a grievous problem with cooperative R&D: efficiency demands that contracts go to the most qualified bidder, but politics demand "affirmative action" for less experienced firms in countries hoping to play "technological catch-up." Either the poor help to subsidize the rich, or the rich subsidize mediocrity in the short run and new competition in the long run.

While ESRO struggled, ELDO fizzled. It had projected a European booster consisting of the Blue Streak as first stage, a French-built second stage, a German third (or apogee) stage, and an Italian test satellite. Anyone familiar with the difficulties of systems interface in the American program can imagine the boondoggle of an international rocket. By 1969, the Europa booster had gone through numerous design changes, had never flown, and was 350 percent over initial budget. Veterans of those days have written positively impolite accounts of their experiences with foreign colleagues. One of the more tolerant was this depiction of national temperaments: "Whenever we faced a technical or administrative problem requiring improvisation, the French would stubbornly refuse to violate any hard-won principle of procedure; the Germans would endorse

* Belgium, Denmark, France, Germany (West), Italy, Netherlands, Spain, Sweden, Switzerland, and the United Kingdom. Austria and Norway had observer status.

the principle, then list all conceivable exceptions; the Italians would excitedly urge re-negotiation of the principle to accommodate the offending contingency, while the British would cheerfully accept any improvisation without question—so long as under no circumstances would it serve as a precedent!"¹ Others complain that European ministries used ESRO and ELDO as dumping grounds for deadwood personnel. In any case, the babble of tongues only exacerbated the habitual lack of communication among scientists, engineers, and bureaucrats.

By the late 1960s, the European space effort was a shambles. That it persisted was due in part to a second shock wave from abroad—the first had been the Soviet *Sputnik*, the second was America's vigorous reaction to *Sputnik*. From aboard, America's heady expansion of the 1960s seemed to comprise nothing less than a second industrial "takeoff," illustrated by her space triumphs, booming economic growth, and ubiquitous foreign investment. It all seemed to stem from what one French economist called "the keys of power": government forcefeeding of science, technology, education, and investment in "point sectors" of the economy, especially aerospace. Americans themselves may never have felt entirely comfortable with the massive increase in state stimulation of economic and social change, but the American model made a profound impression on a Europe already inclined toward *étatisme*. European economists and pundits swallowed the arguments of the Kennedy and Johnson administrations on behalf of big-government R&D even more than we did ourselves. The visionary Apollo program and its technological and managerial "fall-out" had seemed to open a vast technology gap between the U.S. and Europe. Talented Europeans fled to the advanced laboratories of America, causing a "brain drain" that further handicapped European science. It seemed the old industrial and imperial powers would face a future of "industrial helotry" if Europe did not match the technological surge of the U.S. DeGaulle himself intoned: "We must invest constantly, push relentlessly our technology and scientific research to avoid sinking into a bitter mediocrity and being colonized by the invention and capacity of other nations."²

For European business the apparent threat from America, later popularized by Jean-Jacques Servan-Schreiber's *Le Défi américain*, was the best propaganda for higher space budgets. As early as 1961, European industrialists had formed a private lobby called EUROSPACE. Throughout the 1960s it beat the drum for state-financed R&D, warning Europeans against their tendency to sniff at the technical accomplishments of boorish Americans while taking comfort in their superior culture. "Carthage was a flourishing culture," observed the

president of EUROSPACE, "when it met its doom. And it was not the exceptional culture or eloquence of Rome that allowed her in turn to resist the pressure of barbarians." Rather, "the evolution of all humanity is closely linked to technological progress. . . . If Europe does not regain her place in the first rank of technological civilization it will soon be too late."³ The Germans expressed this as *Torschlusspanik*: Europe must leap now or the door to the space age would slam shut. The Italian government called for a "technological Marshall Plan." In Britain, Harold Wilson proposed a "European Technological Community."

These fears and exhortations of the late 1960s proved to be exaggerated. But they seemed to be confirmed at the time by the one profit-making enterprise in space applications—Intelsat. This consortium for international telecommunications satellites founded by 19 nations in 1964 was an American show. The U.S. controlled 61 percent of the voting authority and all the technology. It was even managed under contract by the U.S. Communications Satellite Corporation, which was dominated in turn by such giants as American Telephone and Telegraph (AT&T). This situation irked the Europeans, but there was no competing with the Americans since U.S. export laws forbade sale of launch technology to Europe, and NASA was under orders not to provide launch service for satellites able to compete with Intelsat. Here was precisely the sort of dependency of which the French always warned.

The early 1970s were consequently a confused time of negotiation and reorganization for the extant and aspiring space powers. Apollo was winding down and the Shuttle being planned. The U.S. invited the Europeans to cooperate more closely in space while talking compromise on Intelsat and satellite launch policy. Why should Europe waste millions to duplicate American efforts? This was persuasive, but on the other side the French continued to campaign for independence, offering to take the lead in a reinvigorated European effort. The result was a grand compromise. In 1975, a new European Space Agency absorbed ESRO and ELDO, drawing on their facilities and experience, but dedicated to avoiding their shortcomings. A new system of *à la carte* financing, by which members need pay for only the programs they support, and centralized management of major programs under a single country, promised both *juste retour* and improved efficiency. European aerospace firms also promoted equitable subcontracting through formation of private international consortia.

ESA was built around three main projects, all now nearing completion, which reflected the compromise between independence and collaboration with the U.S. To Britain went the major role in funding and

developing the MARECS marine navigation satellite system; West Germany received major responsibility for the sophisticated Spacelab,* a space sciences module custom-made for the cargo bay of the U.S. Shuttle. Finally, France charged ahead with development of Ariane, a heavy satellite launcher capable of boosting communications satellites into high geosynchronous orbits. Meanwhile, the U.S. relinquished control of Intelsat in a new, permanent convention—and European and Third World delegates promptly voted to deny a launch contract to the U.S. and sign on with Ariane.

It would appear at present that Europe has finally succeeded in fashioning the diplomatic, organizational, and technical prerequisites for a sustained, effective space program. European aerospace and electronics firms—often bearing worthy risks in light of fickle government policies and uncertain markets—have reached state-of-the-art expertise in chosen fields. But the future of Europe in space is still far from assured. ESA is still troubled by political and economic difficulties, and the central goals of European space activity are still unenunciated after 20 years. Both Eurospace and ESA's Director-General, E. Quistgaard of Sweden, pressed again in 1981 for a plan of space development for the decade of the 1980s. As in the past, member governments refused to look beyond immediate budgetary cycles or enunciate long-range goals. Funding should continue at current levels of about \$840 million per year, enough to support an approved second launch pad at Kourou, French Guiana, development of the improved Ariane 2 and 3, and possibly an experimental Earth resources satellite. But new starts are few, and scientific missions like Giotto, the gripping rendezvous with Halley's Comet, are small potatoes. In fairness, one must recognize the inability of the U.S., freed of multilateral confusion, to draft long-term plans of its own. But as Quistgaard laments, all the problems of the individual European governments *and* of the balked process of integration weigh upon those charged with getting Europe into space.

Every member state contributes unique strengths and weaknesses to ESA. But the character of the European space program from its inception has been shaped above all by France. ESA still lies in the shadow of a Gaullist Europe that never happened. Britain never could have led Europe into space. Her tired taxpayers and confused bureaucrats were

* The prime contractor for Spacelab was the German firm ERNO, a subsidiary of VFW. Its development cost was \$800 million. The first operational Spacelab mission, featuring a German astronaut, was scheduled to ride the Shuttle in late 1983.

most skeptical of glamorous R&D, had no defense motive, and were of two minds about European integration. Germany was the founder of modern rocketry, but she was barred from missile R&D because of the unpleasant use she made of the V-2. Only France was capable of a gritty national effort and of taking the lead in cooperative programs. And the advent of DeGaulle by historical accident in 1958 meant that France's mission in Europe, and Europe's in the world, were defined in terms exceptionally favorable to space activities. But it also meant that Europe in space would be stamped with Gaul'ism. ELDO and ESRO—instead of helping to forge a united Europe—served instead to elevate France within a Europe in which national prerogatives would be closely guarded and international institutions promoted mostly as a tool against the Anglo-Saxons.

France dominated ESRO and ELDO, and her industries benefited most from them. France's cooperation policies with Europe, NASA, or the Soviet Union were designed as much to tap foreign funds and skills for the benefit of her own national program as the other way around. It was France that led the campaign against dependence on America, even when logic may have dictated a division of labor. It was France that bartered her indispensable cooperation for ESA's approval of a Franco-European launcher and Franco-European communications satellite program. And it is France that benefits most today from the prestige, technology, and military applications of European space research.

This is not to say that France has exploited others. She has consistently made the largest contributions to European space funds, currently 25 percent. Nor is it to say that France's partners in ESA do not glean rewards commensurate with their participation. Nor is it even clear that the Gaullist insistence on French independence was not farsighted, given the uncertainties of world politics and power balances over the long run. But the fact remains that French space policy has been doggedly nationalistic, and that the European space establishment—as are all other European institutions—is a hostage to that policy.

What of domestic support for space activity? Here again, the role of Gaullism is critical. To be sure, public opinion has had its cycles, as the U.S. European excitement and worry about technological inferiority peaked around 1968, and by the early 1970s, Europeans, too, were becoming disenchanted with technology as a social panacea. Thus, even as ESA came into being, European opinion was cautious on space spending. ESA and member governments have sometimes been uncertain what posture is best for the protection of space budgets: proud publicity or a low profile. Today the chances are good that the man on the street in

Lyon, not to mention Naples or Liverpool, is scarcely aware of FSA or Ariane. But current apathy ought not to obscure the deep domestic significance of the space effort. For the legitimacy of a French or European thrust into the cosmos is rooted in the historical circumstances of its birth, in the role that technology was to play in the stabilization of the Fifth Republic. DeGaulle declared himself a defender of traditional France in social relations, politics, and culture, even as he decreed the end of imperial France (with retreat from Algeria), the end of European France (with resistance to further integration), the end of atlanticist France (with withdrawal from NATO), and the end of socialist France (with defeat of the left). In order to preserve tradition in the abstract realms of French life, DeGaulle proposed to overthrow tradition in the material realm. Technological revolution would translate abroad into the prestige and independence of French tradition, and at home in the seductive vision of the future that invited France and Europe to imagine themselves "in the year 2000," that inescapable slogan of contemporary Europe.

Hence the legitimacy of a Gaullist regime that claimed to play midwife to the future even as it invoked the past. What DeGaulle actually offered was a French version of our own "Republic of Technology," in which social and international challenges alike are spirited away (in theory) through the genie of the technological fix; where leaders pose as defenders of tradition even as they undermine it indirectly through technological revolution. In a Europe that is frankly nonideological, materialistic, and atheistic, this pattern of technetronic politics is discernible not only in France, but everywhere.

Has high-technology investment really transformed Europe? This is a tough question, given the difficulties of measuring second-order consequences of R&D. European industry has certainly escaped "backwater" status, and western Europe is again part of the world technological vanguard. But the effect of space activity on Europe must still be sought in the political, not economic, realm. For the Europeans chose to reject a global division of labor in space, and thus to duplicate many U.S. and Soviet achievements. And for what? Arianespace, the new commercial firm, may show a profit, but only because its R&D costs were absorbed by European taxpayers and because its launch price may be subsidized to compete with the Shuttle. In any case, Ariane only matches a capability the U.S. had had for two decades. As for the goal of industrial prowess, European motives were again largely political, as demonstrated by the fact that European aerospace firms have become semi-public "chartered companies" of the state. The recent German union of MBB (Messerschmidt) and VFW is only the latest in a series of forced mergers that previously

produced British Aerospace, France's Aerospatiale, and Italy's Aerospaziale—all for the purpose of competing, not in capitalistic, but in mercantilistic fashion, with the giant American firms and with each other, in a business otherwise too big for "little" Europe.

As the 1980s mature, it is entirely possible that even the concentration of resources within each European state, even the pooling of resources among European states may not suffice to sustain an independent European role in space without sharply higher levels of spending, which in turn may prove politically impossible. Even at the two peaks of the mid-1960s and late 1970s, Europe spent only a dribble on space: 0.1 percent of combined GNP versus 1.5 percent for the USSR and between 0.5 and 1.0 percent for the U.S. In per capita terms, the superpowers have spent 20 times more than Europe. As the U.S. now gears up for another space/defense push, and as reusable spacecraft, antisatellite weapons, and permanent space stations emerge as near-term prospects, the future of a coherent, independent European space effort is dubious. By around 1985, with Ariane and Spacelab and MARECS completed, the Europeans will again have to face the question "L'espace pour quoi faire?" Member governments may have to:

- Ante up a considerable investment on a truly multilateral basis, implying unprecedented political unity;
- Continue such programs as Ariane permits, but otherwise accept a role of "subcontractor" to the U.S. in the many fields of space exploitation made possible by the Shuttle;
- Throw in the towel, cutting back state expenditures on space and accepting a reduced or very different view of the role of western European states in the world.

Severe economic crisis could force the third course. Otherwise, the French will remain independent and ambitious. The Americans will continue to extend the hand of cooperation, in part to relieve their own budgetary strains. The Germans, whose wealth and expertise are attractive, will be in the middle, wooed by Washington and Paris as they were in DeGaulle's day. For the Shuttle may open up a universe of possibilities in space industrialization, weaponry, satellite repair and recovery, permanent manned stations, and more. The Germans in turn will be enticed—and the irony may come to pass that decisions made in Bonn and not Paris will finally determine what "Europe in the year 2000" will be doing in outer space. Giarrini's intuition may soon prove valid, that "Europe will be made in space . . . or not at all."

Source Notes

1. Jacques Tassin, *Vers l'Europe spatiale* (Paris, 1970), pp. 98-99, a somewhat embellished paraphrase.
2. Charles De Gaulle, *Adresse à la French Nation*, 1964.
3. Jean Delorme in EUROSPACE, *Europe and Space: An Assessment and Prospects* (Konstanz, 1971), pp. 6ff.
4. The neologism is Zbigniew Brzezinski's. See *Between Two Ages: America's Role in the Technetronic Era* (New York, 1970).

References

- For general accounts of the world's space programs:
 House Committee on Science and Technology, *World Wide Space Activities* (90th Congress, Washington, 1977).
- Alain Dupas, *La lutte pour l'espace* (Paris, 1977).
- On European space efforts:
 Orso Grani, *L'Europe et l'espace* (Lausanne, 1968).
 Robert Gilpin, *France in the Age of the Scientific State* (Princeton, 1968).
 Jean-Jacques Servan-Schreiber, *The American Challenge* (New York, 1968).
 Jacques Tassin, *Vers l'Europe spatiale* (Paris, 1970).
 Georges Thomson, *La politique spatiale de l'Europe* (Dion, 1976).
 Norman Vig, *Science and Technology in British Politics* (Oxford, 1968).
- On the Soviet space program:
 Nicholas Daniloff, *The Kremlin and the Cosmos* (New York, 1972).
 James Oberg, *Red Star in Orbit* (New York, 1980).
 Charles Sheldon, *U.S. and Soviet Progress in Space: Summary Data through 1973 and a Forward Look* (Washington, 1974).
 Leonid Vladimirov, *The Russian Space Bluff* (London, 1971).
- On Intelsat:
 Jonathon F. Galloway, *The Politics and Technology of Satellite Communications* (Lexington, Mass., 1972).