

Editor's Notes

The lines from Sir Richard Burton's **Kasidah** at the head of our last number seemed a perfect illustration of the conventional ideas of Luna discussed in the piece titled *Blind Spots*.

A mass of undistributed copies of №7, from a trial of offset printing, perhaps contributed to the unseemly delay in the appearance of this number. It also, however, encouraged me in sending out packets, for example, to science-fiction conventions for their flyer tables. Suggestions as to where such may usefully be directed are invited.

We have also begun to experiment with Internet advertising as an avenue of outreach. Following our overall strategy of seeking a sympathetic audience first, and in the interests of simplicity, this has involved using the *Project Wonderful* service to promote the Project mostly in science-fiction- and space-themed Web comics. Whether this notoriously low-density form of publicity will prove an effective method of raising awareness remains to be seen.

Despite these efforts, response continues lukewarm. For example, although eBay orders have arrived from points as distant as Punta Arenas and Bucharest, volume has fallen off considerably in the new year, with some months bringing none at all.

—Christopher Carson
(*publius*)

Moon Phases

First Quarter	26 October 00:41 GMT
Full	2 November 19:15 GMT
Last Quarter	9 November 15:57 GMT
New	16 November 19:14 GMT
First Quarter	24 November 21:38 GMT
Full	2 December 07:32 GMT

Third Best Today

Sir R.A. Watson-Watt, who was central to the development of the British air-defence radar system of the Second World War, spoke of three stages in the technological solution of problems. “Third best today” was whatever makeshift could be pressed into service to meet an urgent need ; “second best tomorrow” was a more satisfactory approach achievable with working experience ; and “best never” was the chimerical perfect solution, a target moving continually with changes in technique and circumstances, and accordingly never reachable.

The space age began with a third-best approach, using modified military missiles, not because they made especially good launch vehicles, but because they were available. *Apollo* took a second-best route to the Moon, adapting equipment and techniques already under development to the job at hand. Space activity since then, however, has increasingly become a best-never affair, in which nothing can be done until the unique perfect solution can be flawlessly implemented — and therefore nothing is done.

Although it is now widely accepted that the goal of human space activity is (in the words of a recent U.S. government report) “human expansion into the solar system”, any attempt at serious discussion of this topic tends to be met with the objection that it is premature. Perhaps this was true in the 1970s, when the modern space movement was in its infancy, but if it remains so today, it is only because this attitude has prevented the work necessary to achieve maturity.

The cost of lift from Terra, it is first, last, and always objected, is too high. Without an expanded scope of space activity, however, there will be no market for cheaper launch services. The lack of heavy-lift capability is also often advanced as an obstacle to progress. For some purposes it is, but precision lunar-surface rendezvous, demonstrated (with an unresponsive target) in 1969 by *Apollo 12*, considerably reduces the impact of the problem.

While a true closed-loop life-support system has not yet been developed, oxygen regeneration and water recovery are already in use on the International Space Station, and a basic level of food production appears to pose

no special challenges. Dependence for basic needs on terrestrial supplies can thus be significantly reduced, though not yet eliminated. Likewise, even though the problems of obtaining useful materials from lunar sources, and manufacturing products in the new environment, are far from solved, there are several very promising techniques.

The prevailing mindset would exclude such unproven capabilities from ‘critical paths’, but they are vital to settlement. Must we, then, give up the idea, at least for the present? No ; rather than try to exclude failures, by doing nothing that might fail, we can tolerate them. What is needed is flexibility, reserve capacity set aside commensurate with the technical risk of each element, and above all the willingness to accept temporary reverses in the course of learning by trial and error.

The truth, it appears, is that if we are willing to wait for space development, then wait we shall — but we could just as well begin now.

Progress

California Public Utilities Commission (Energy Division) Resolution E-4286, dated 3 December 2009, authorizes Pacific Gas and Electric to recover from ratepayers the cost of purchasing 200 megawatts of electricity, up to 1700 gigawatt-hours per year, under a contract with Solaren Corporation. The power is to be generated from sunlight in geosynchronous orbit, and delivered at an antenna in Fresno County.

The significance of this can hardly be overstated. It marks the first time that space solar power, or indeed the delivery from space of any commodity save information, has been treated as a commercial proposition. The result will be to make all space development projects more credible prospects for market capital.

Even with the lightest-weight construction possible, a 200 MW generating capacity is far beyond the payload of any existing or projected launch vehicle. Since on-orbit assembly techniques are not yet well-developed, the project will probably employ a cloud of individual power satellites. This approach is especially

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A Question of Approach

Buzz Aldrin has recently proposed the formation of a *Lunar Infrastructure Development Corporation*, an American-led consortium on the model of Intelsat which would establish and maintain an exploratory base on the lunar surface, along with other related systems and facilities. The leaders of the Moon Society have endorsed this, seeing in it (as Astronaut Aldrin no doubt intends) a first step toward permanent occupation, and a parallel to their own *International Lunar Research Park* concept.

We wish that we could be so sanguine, but it is difficult to generate much hope for a plan — even one with such an eminent sponsor — which depends on government action and stops short of settlement. The two perennial issues remain : first, the lack of a compelling case for space as far as national governments are concerned ; second, the ease with which programs can be cut back until they are not worth doing, then cancelled.

A government is not likely to act unless presented with a rationale for action which is convincing from its perspective. If Astronaut Aldrin fails to do this, it is no dishonour to him — the post-*Apollo* era has seen little success in that respect. He rightly observes that international commitments have been a major factor in keeping the United States involved with the International Space Station, but hardly shows cause for taking on new obligations of the same kind. International prestige, and leadership in science and technology, are prospects with little power to hold the attention of our politicians. ISS found justification in the post-1990 need to keep Soviet rocket experts working for the Russian government instead of selling their skills on the open market, but it has not escaped years of delay, or the deletion of some of its most interesting capabilities.

Furthermore, while he counts on the tendency of a base, once founded, to grow in capabilities, it is difficult to be confident of that. Scientific and exploratory space missions are often sufficiently ‘de-scoped’ by the deletion of everything not strictly necessary to their nominal objectives that, even when they are not cancelled as insufficiently rewarding (like the last NASA lunar base proposal, which had devolved into a human-visited automatic station and was essentially abandoned, even while *Constellation* was still expected to go ahead), the possibility of such extension is foreclosed upon. Settlement is a demanding goal which we may be hard-pressed to reach unless it is our explicit objective from the outset.

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suitable for a pilot plant, since the very large effective aperture of the power-beam transmitter will allow greater beam density and pointing accuracy than would be possible with a single antenna of reasonable size and mass. Regardless, the large associated demand for launch services should help stimulate the development of lower-cost, higher-capacity systems than are now available. Naturally, if space solar power comes to be adopted on a large scale, it will be a great driver of overall space development — though we had better not hold our breath.

Emphasis

Early in October, I received two begging letters which, between them, perfectly illustrate the dichotomy in approaches to the space question. The first was from the National Space Society, and included (as NSS mailings often do) a petition to sign, this one addressed to President Obama, along with a request for a “generous emergency contribution” of funds for unspecified purposes, vaguely implied to be related to political lobbying. The second was from the Planetary Society, soliciting for their *Carl Sagan Fund for the Future*, intended to support projects not being paid for by other agencies. Regular readers will not be surprised to learn that I signed and returned the petition, along with a letter explaining that I was enclosing no money because I did not believe it would be applied productively, and that I answered the Sagan Fund appeal with a cheque and a note encouraging the policy of direct action which it represented.

What I found really remarkable in the NSS letter was the statement, alone on a line of its own and in boldface, that “NASA does not have the means to match its aspirations for future human spaceflight.” Executive agencies of the United States government do the jobs given them by Congress, under the leadership of the President ; they are not the sort of entities which have their own ambitions. It would be more just to say that NASA does not have the funds to match *our* aspirations — but even if it had the money, could it do the work?

The apparent general willingness within NASA to support the realignment of that agency’s role embodied in the recent Administration space policy proposals has been very encouraging. The entrenched interests, however, still hold sway in Congress, and whether any substantive change to the stagnant national space policy of late years can be expected is unclear. We must find our own way forward.

Events

Astronomicon²,
Rochester, 6–8 November
LosCon⁴³, Los Angeles,
27–29 November
Arisia 2010³, Boston,
15–18 January
**Life, the Universe, and
Everything**², Provo,
11–13 February
Boskone², Boston, 12–14
February
ConDFW¹, Dallas, 12–14
February
Furry Fiesta², Dallas,
19–21 February
Lunacon¹, New York,
19–21 March
I-Con², Long Island,
26–28 March
Norwescon², Seattle, 1–4
April
Space Access Conference,
Phoenix, 8–10 April
Conestoga², Tulsa, 23–25
April
AnimeCentral², Chicago,
14–16 May
Leprecon², Phoenix,
14–16 May
**International Space
Development
Conference**², Chicago,
27–31 May
TimeGate², Atlanta,
28–30 May
Balticon², Baltimore,
28–31 May
Aussiecon 4³ (Worldcon),
Melbourne, 2–6
September (Progress
Report 2, 24 January, and
Souvenir Book)
Completed
Definite
Under Consideration
¹Table
²Small Display or Flyers
³Advertisement

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