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## Liftoff: The Story of America's Adventure in Space

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personally to the almost complete disconnect between the technologists in the DOD laboratories and the acquisition program managers. What kind of efforts are made by any of the services to "market" study results to all of the tiers of the defense industrial base? All too often the results of far-reaching studies are given "eyes only" treatment. One can only hope for reform in systems acquisition education, at places like the Defense Systems Management College, so that fewer technology base opportunities will be missed.

I repeat: This is a worthwhile book. I hope someone will commission a navy companion piece, and, for that matter, one for the army as well. But if such activities are undertaken, they should be related to the tribal rites that each of the military departments follows in its acquisition and force development processes.

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Collins, Michael. *Liftoff: The Story of America's Adventure in Space*. New York: Grove Press, 1988. 288pp. \$25

Well, he's done it again! Michael Collins, fighter pilot, experimental test pilot, astronaut, State Department official, museum director, and author, has produced another superb book. His previous effort, *Carrying the Fire*, is a highly personal account of his own development and adventures in aviation and astronautics.

This fascinating, occasionally hair-raising memoir is an ideal introduction to the current effort.

*Liftoff* is more ambitious. In seven exceptionally well organized chapters, the author traces the engineering and technical development of capabilities for space travel in language which will capture the general reader and yet still satisfy all but the most specialized practitioners in space endeavors.

The range of description and analysis is unusually broad. The Apollo XI mission to the moon, during which Collins traveled with the first moonwalkers but did not descend himself, reads like an adventure novel. The description of the Challenger disaster is an exquisite balancing act among technical precision, compassion, and perspective on failure in what has been a remarkably successful program overall.

The final chapter, "Ad Inexplorata," could stand alone as a first-class piece of thinking and writing. It begins with a remarkably clear exposition on our solar system. Then, Collins argues persuasively that a commitment to explore Mars could be the keystone to renewal in the United States, not only of the space effort but of national purpose in general. Collins shows himself simultaneously visionary and practical, culturally sensitive and politically savvy.

The book is very well put together. Its page format is somewhat larger than normal, a great asset when presenting the

artistic and technically informative drawings by James Dean. These drawings added a great deal to this reviewer's understanding of what was already clear prose. A list of acronyms at the beginning, a first-class glossary and space flight log at the end, and an unusually complete index all help to make the book a pleasure to handle. Author, illustrator and publisher deserve highest praise. *Liftoff* is "a piece of work."

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Ellison, John N., et al. *Mobilizing U.S. Industry: A Vanishing Option for National Security*. Boulder, Col.: Westview Press, 1988. 126pp. \$12.85

Mobilization is a topic which has been out of fashion for many years, despite occasional lip service to the contrary. This short volume (only 88 pages of text), by members of the International Economic Studies Institute, is a "cry in the wilderness." The message is straightforward. Nuclear parity has made strong conventional forces more important. Large budget deficits will inevitably force the country to choose cheaper, and thus smaller, high quality forces in being, backed up by stronger reserve forces and improved surge and mobilization readiness. The U.S. industrial base is being seriously eroded by international competition, calling into question surge and mobilization capabilities. This erosion is occur-

ring at a time when those capabilities should be expanding, not contracting. Accordingly, the authors call for a series of organizational reforms, new committees and new studies to focus attention on mobilization issues and to provide an administrative framework for enhancing the mobilization base.

The book begins with a short introduction, followed by an equally short chapter outlining the argument for the current and future importance of mobilization preparedness for defense. The argument, as noted above, is that conventional forces are increasingly important, and that tight budgets preclude the luxury of sufficiently large conventional forces in being. Further, the authors note that if arms control reduces Soviet conventional forces, mobilization becomes an even more viable U.S. national security option. Chapter III, which occupies half of the book, presents a series of case studies of some key sectors: raw materials, petroleum, ferroalloys, machine tools, and semiconductors. These studies serve to document the contention that the mobilization base is seriously eroding. Selected to represent basic inputs, processing and manufacturing industries, and high technology sectors, the case studies suggest common problems: diminishing domestic market share and growing reliance on foreign sector and subsector capacity; declining profits, capacity and R&D expenditures; a diminishing pool of skilled labor; and economic decline in subsector industries.