

Space Probes, by Philippe Séguéla
50 Years of Exploration from Luna 1 to New Horizons
<http://www.fireflybooks.com/bookdetail&ean=9781554079445>

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FOREWORD [by JAMES E. OBERG]

As human spacecraft now close in on the last unreached physical frontiers of the solar system (namely Pluto and the surface of a comet), I am reminded of Carl Sagan's poetic exaltation of the unique place our generation holds in the entire parade of human exploration. Sagan explained that until our time, people could speculate idly about conditions on other worlds but never hope to discover them, but after us, anybody with the curiosity to ask will be able to get the answers from historical records stored on some handy nanochip. We alone of all humans were present at the transition, at the brief span of time when we converted the worlds of the Solar System from "mostly unknown" to "mostly known."

This fine book is a tribute to that exploration explosion, as our robot emissaries reached, one by one, farther and farther goals. Its visual value is superb, and the text is a perfect accompaniment to the prettiest pictures I've ever seen collected under one set of covers. It offers a narrative of what we have discovered with space probes, with attention paid to how we accomplished it. And it does so with a commendable editorial discipline of not wandering too far astray, except where occasional side notes add to the sense of discovery. This approach perfectly communicates how, even though our far-flung senses and manipulators may be mechanical, their guiding spirit is eminently human, and the exploration instinct these automata serve is based on the human agenda, not on theirs.

It is also breathtakingly visual, especially in the images from more recent explorations. The production qualities made me run my fingers over many of the pages to make sure they weren't really as three-dimensional as they looked.

This book is not a nostalgic retrospective of a completed, finished task. It is instead a survey of the first of what will be many ascending waves of reconnaissance. As such, it is a guidebook to off-Earth theatres of astonishment that await our year-by-year more capable automata and, eventually, ourselves.

We are realizing that Sagan's flowery words may have underappreciated the time scale of this sudden explosion of knowledge that we have been experiencing throughout our lifetimes. Young readers need not be envious of the uniqueness of their elders' extraterrestrial epiphanies, because I suspect the best is yet to come. The knowledge explosion is far from over.

Sagan himself could scarcely have dreamed — or hoped to discover — what we are on the verge of finding out: that our Earth-bound, narrow-minded fixation on "life as we know it" doesn't even apply to our home planet. In only a fraction of a lifetime we have come to realize that most living terrestrial organisms inhabit ecological niches away from sunlight, under thermal and chemical conditions that we now realize also occur inside the skins of at least two dozen other worlds. And we have realized that spores can survive transplanetary trajectories, impelled by natural asteroid impacts, which destroys any notion of biological quarantine all the way back to the birth of the Solar System.

If we reason by analogy with what we now know about the largest component of life on Earth — the subsurface microbes — then we have a good basis to suspect that “life” in similar environments on other worlds would also be microbial, not multicellular. But that kind of logic, assuming that “life as we know it” is the limit of nature’s creativity, is the same discredited formula that led us to be so surprised by the current new paradigm of potential — even probable — enclaves of water-based “life” elsewhere in the solar system. When fundamental physical and environmental factors are significantly different — pressure, gravity, radiation, whatever — what we call “life” can be expected to show remarkable adaptational flexibility. But whatever we “expect,” we should certainly expect to be astonished again and again, and maybe from directions that we least “expect” it! The only remedy is to go and look, go and dig, go and poke around — and we will.

We are finally ready for the curtain to rise on “Space Reconnaissance 2.0,” as we begin to catalog the biochemical provinces of what we once had convinced ourselves was a dead and sterile outer space outback. Now at the early dawning of that endeavor, this book is a grand tribute to what has been found out so far and to the people who did it, and moreover, it is a testament to the impulses that will power the next stage of exploration and discovery.

The last sentence of the author’s narrative is this: “The discovery of life elsewhere in the solar system or beyond will be a defining moment in human history and probably shift future space exploration in directions impossible to appreciate today.” But even though it’s obvious, it bears saying again and again. Making it the book’s last sentence allows it to serve as the jumping-off point for the next retrospective, to be written half a century from now, based on the astonishments awaiting the next generation — who will NOT be disappointed.

We must be reminded that even Sagan, who was mind-bogglingly poetic, was very likely to have been wrong to think his generation would ever monopolize history's most spectacular space discoveries. The past, as another poet said, is not the epilogue to a vanished age of heroes. The past, particularly in planetary exploration as chronicled here, is only prologue.