



Science As Literature

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WHEN EXPERTS in the field of children's literature speak or write about their field and comment on "great" literature or classics, they are usually referring to fiction. Why? Why can't an informational book—a science book—be considered in this category?

Most of the criteria by which books for children are evaluated apply to nonfiction as well as to fiction: good format, clarity, accuracy, communication of the author's attitudes, adroit use of language, and concepts and vocabulary appropriate for the age of the intended audience; no jargon or writing down; no teleology or anthropomorphism; respect for the integrity and adaptability of the reader; humor where it is appropriate; logical structure or organization; a writing style that is distinctive for its originality in the use of words and word patterns.

There are additional standards by which one may measure each kind of book. Some of the requisites of good books are: for fiction, the ways in which an author uses dialogue, develops characters, reinforces theme; for nonfiction, the ways in which the author demonstrates a scientific attitude, accuracy, currency, and sequential arrangement of material.

But are good books literature? In one sense, yes. Everything published for children is part of their literature. In the sense of great literature, no, not necessarily. What is the criterion for greatness? While the lasting pleasure a book may give to generations of children may endow it with greatness, it is primarily in the style of writing that greatness is inherent. It must be acknowledged that the books commonly accepted as children's classics are primarily fictional, although informational books do win some awards, awards not designated to be awards primarily for nonfiction or science, and many do endure. But does this not reflect, perhaps, more our traditional attitudes about what literature is than the intrinsic merit of the best in nonfiction? If the nature of the literary experience per se is to involve

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the reader in the author's creative (or created) world, to communicate excitement, to encourage the reader to go farther than the book, can it not be said that great science books do these things?

The purpose of a science book is to give information, that of a work of fiction to entertain, but it is not rare to find a story that gives information or an informational book that entertains or stimulates the imagination. A stellar example is Victor Scheffer's *Little Calf*, the description of the first year in the life of a sperm whale, written by an authority on marine biology. It begins, "It is early September when for the first time the Little Calf sees light . . .,"¹ and continues, "On a morning in early October the sea is glass, without a ripple or sound. A feather falls from the breast of an albatross winging its lonely way northwestward to the Leeward Islands and home. The plume drifts lightly to the sea and comes to rest on a mirror image. It is a day when time itself is still."²

The narrative style and story framework are used by many authors in writing about animal life; Robert McClung, Alice Goudey, and Bernice Kohn Hunt use them regularly and capably without anthropomorphism. Comparatively few animal books are written with the combination of authoritative knowledge and elegant prose that Scheffer contributes. Aileen Fisher also achieves it in *Valley of the Smallest*, the story of a shrew:

Undisturbed by the roar of the wind, she was snatching a bit of sleep in a sheltered place away from her nest before hunger drove her to hunt again. For hunger ruled her life. No one in the valley searched for something to eat with such continual frenzy. . . . She never sat just doing nothing, like the Snowshoe Rabbit who lived under the spruces at the edge of the old beaver flat. She never lazily sunned herself on a rock while she surveyed the world, like the Ground Squirrel who lived near the old pine. She never slept quietly all day, like the Deer Mouse. She kept on the run day and night, winter and summer, searching for something to give her the energy to keep on running and searching.³

If one of the purposes of a good science book is to communicate the author's curiosity and enthusiasm (rather than to flatly state, "This is exciting"), and one of its tests, the ability to arouse a similar curiosity, Fisher does both in her poetry. From *Feathered Ones and Furry*, "How?"

How do they know
the sparrows and larks

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when it's time to return
to the meadows and parks?

How do they know
when fall is still here
it's the "thing" to go south
that time of the year?

Do you think that a bird
is just smart, or, instead,
that he carries a calendar
'round in his head?⁴

Jean Graighead George, whose Newbery Award book, *Julie of the Wolves*, is the story of a feral child whose patient cultivation of wolf behavior is solidly based on observation and research, has written outstanding science books for quite diverse age groups. In *All Upon A Stone*, a provocative vignette that surveys the complex community of flora and fauna on a single stone, the text is for the primary grades reader. In *Spring Comes to the Ocean*, for ages eleven up, the author conveys a sense of wonder in dignified prose that verges—but just verges—on the lyric.

On the surface, the light ticked off the inner clock of a diatom. Sea foods flowed inside its tiny cell, and the diatom used the nitrogen and phosphorus and grew a wall which divided it in two. And each half was the same as the other. Violently they split apart and there were two glassy plants, with green spots of chlorophyll shimmering inside them. The two sections drifted apart, and the nutrients of the sea seeped through their porous walls. A delicate wall grew down the middle of each, they split and separated, and then there were four. There were eight—sixteen! And all over the ocean from Georgia south each plant that bright sunny morning took in food and split in half until there were tons of plant life by the one billion, two billions, four billions.⁵

While it is true that most of the science books that are distinguished for their style seem to be in the various biological sciences (from books for the very young, like Alvin Tresselt's *Hide and Seek Fog* and Golden MacDonald's *The Little Island*, to Rachel Carson's *The Sea Around Us* and *The World of the Ocean Depths* by Robert Silverberg) there are outstanding science books on almost every subject. Some of these are: Franklyn Branley's *The Christmas Sky*, based on the Christmas lecture at

the Hayden Planetarium, where the author directs the educational program; Millicent Selsam's *Birth of an Island*, lucidly written as are all her books, describing the evolution of a volcanic island; Lancelot Hogben's *The Wonderful World of Mathematics* or the provocative *Beginnings and Blunders: Before Science Began*; Isaac Asimov's *The Clock We Live On* or *Building Blocks of the Universe* and dozens of other titles as witty as they are erudite; Corinne Jacker's *Window on the Unknown*; Alan Anderson's *The Drifting Continents*; Joan Lexau's *Archimedes Takes a Bath*; and Leonard Cottrell's *Digs and Diggers*.

All of these are lively books that can stimulate curiosity and satisfy it at the same time, books written with distinction and sometimes with humor or poetic vision, books illustrated with care: pictures placed correctly in relation to the text, accurate in their captions or labels, true to scale, and often beautiful. The precision and restraint of the drawings by Edwin Tunis in his *Chipmunks on the Doorstep*, the meticulous accuracy of Anthony Ravielli in his book *From Fins to Hands*, and the brilliant colors of the paintings in Colette Portal's *Life of a Queen* all add immeasurably to both the beauty and the informational value of the texts they illustrate.

There are values in the best science books beyond the fact that they instruct or even that they excite the reader's imagination. Even such a wordless picture book as Iela Mari's *The Apple and the Moth* can stimulate a child's awareness of discovery through observation. All of the books in the Crowell's "Young Math Books" series (distinguished for the discretion with which the scope of the text is limited for the young audience) focus on basic concepts. *Chemistry of a Lemon*, by A. Harris Stone, was one of the first trade books to reflect the use, in science education, of the process approach. From books like these the reader can learn the pleasure; the objectivity; the need for patience in sifting, matching, comparing, deducing, and testing needed; the pooling and diffusion of knowledge; and the fact that there are no national boundaries in scientific knowledge.

Much of what is published for children each year is pedestrian or ephemeral. Some of it is good, some very good. Very little is great, and this is true of nonfiction and fiction. But *if* there is more fiction that is good or great, it is still true that some informational books—science books among them—stand out as distinguished exceptions to the mass of what is now in print. Perhaps we have not fully appreciated what we have. Certainly in the comparative paucity of books from abroad (a paucity, for example, compared to the British fiction that appears in American editions) and in the slighting of nonfiction in our major

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awards, we may be accused of partiality. Perhaps we tend to forget that children not only need both fiction and nonfiction, but that, as Lillian Smith says in *The Unreluctant Years*, "A child's instinct to learn comes from his wonderings, his curiosity. The more his mind opens to wonder, the more sensitive he is to the satisfactions and enjoyments our earthly life affords. . . . As soon as he can read, a child is attracted to books which give tangible form to the vague shape of his imaginings about his world."⁶

The brief bibliography that follows the References does not purport to be comprehensive. It includes some of the more important books of past years, and stresses recent books that may not yet be widely known. It is divided, roughly, into books for young children up to the age of eight, children from eight to twelve, and young adults of twelve and up. All of the age ranges are suggested rather than delimiting, since children read widely below and above their usual range when stimulated by subject interest. The list does not begin to represent the prolific achievements of such writers as Isaac Asimov, Millicent Selsam, Irving Adler, Herbert Zim, or Robert McClung—it will be the pleasant task of those unfamiliar with their work to find their many books, and a pleasant reminder to those who already know them.

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