Yet in sheer quantity the great speeches are outweighed by pedestrian addresses to interest groups like the Wisconsin Agricultural Society. What the reader finds in most of these two volumes is not art but the conditions for art—not always great speeches but the process of revision that makes great speeches possible. As though in some enormous rough draft, Lincoln kept reworking the same ideas over and over, first in casual formulations, until at last—as in the "House Divided" speech—they issued forth in concise, unforgettable expression.

ELLEN FOSTER and **A VIRTUOUS WOMAN.** *By Kaye Gibbons. Algonquin Books of Chapel Hill. 146 pp.; 158 pp. $13.95 each*

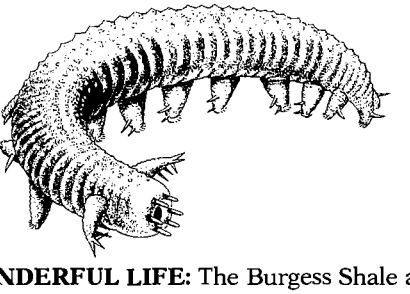
To add the name of a new author to the company of William Faulkner, Katherine Anne Porter, Tennessee Williams, and Thomas Wolfe is no small matter. Yet Kaye Gibbons, a housewife from Raleigh, North Carolina, not yet 30, has added a voice, original and recognizable, to southern literature.

Eleven-year-old Ellen Foster, the heroine-narrator of Gibbons' first novel, calmly describes her mother's illness: "You see when she was my size she had romantic fever I think it is called and since then she has not had a good heart." Ellen suffers, after her mother's death, some of the worst relatives found outside a Dickens novel. But Ellen represents the triumph of the decent and the practical over the tragic: "I fed myself OK," she says when her drunk father fails to appear for meals. "I tried to make what we had at school but I found the best deal was the plate froze with food already on it."

Gibbons' new novel, *A Virtuous Woman*, set in a contemporary but unnamed southern state, is filled with the family love so painfully lacking in Ellen's story. In alternating chapters, Jack Ernest Stokes ("stokes the fire, stokes the stove, stokes the fiery furnace of hell!") and his wife Ruby narrate their separate hardships, their unlikely meeting, and 25 years of living together. Before Jack, Ruby had a disastrous first marriage: "I just hated that the first big decision I ever made was the kind that can kill you if you make a mistake." Before Ruby, Jack had "never come close to marrying. Until I met Ruby I suppose the sweetest thing I'd ever asked a woman to do for me was to hold a mule still while I hitched him." Despite Jack's being a poor tenant farmer and 20 years older than Ruby, they build a good marriage. Yet it is hardly a match for life's sorrows—childlessness and Ruby's cancer. During the terminal stages of the disease, she fills the freezer with enough meals to last Jack through the winter. "Then maybe he'll feel up to planting a garden, carrying the whole thing through by himself."

Obviously, Gibbons can border on sentimentality, but she is saved by her vision of hard vicissitudes and necessary graces. More remarkable are Gibbons' spare sentences and paragraphs in which not a word can be changed without serious loss. From Madison Smartt Bell to Bobbie Ann Mason, contemporary southern writers describe a South shedding its distinctive features—as though Faulkner's mellifluous tragedies had washed up somewhere between tract home and shopping mall; these younger writers' language rarely sounds distinctively southern. But Gibbons' idiom—dry and practical as a farmer's skin, studded with clichés that somehow seem fresh, semi-illiterate yet never so intrusive as dialect—is recognizably southern and recognizably hers. And it is this, the creation of a voice, that makes her cousin to the "old masters," Flannery O'Connor, Eudora Welty, and even Faulkner himself.

Science & Technology



WONDERFUL LIFE: The Burgess Shale and the Nature of History. *By Stephen J. Gould. Norton. 347 pp. $19.95*

In 1909 the prominent geologist and longtime-head of the Smithsonian Institution, Charles Doolittle Walcott, was digging in a quarry in the Canadian Rockies when he uncovered a

Pandora's box of fossils which would eventually—more than 50 years later—turn upside-down the orderly Darwinian theories of evolution.

The Burgess Shale—"little taller than a man, and not so long as a city block"—is a rock slab containing a plethora of early life: creatures with more different body plans than there are in all the oceans, rivers, and lakes on the Earth today. The shapes of fossil-creatures from the Burgess Shale are more than passing strange. Close your eyes and imagine the *Opabinia*, a worm with five eyes on stalks, back claw, and a vacuum-cleaner nozzle up front. Or try to picture a huge *Anomalocaris*, two feet long, also with stalk eyes, a triangular and undulating fluted body, teeth, and curved, front-feeding appendages—a true terror from the deep.

Darwin described evolution as an inevitable progression from worse to better, the weak giving way to the fit, extinct species having "fathered" the superior creatures we know today. But the Burgess Shale creatures are nobody's ancestors, and their body plans are unreflected in any existing species. One morning half a billion years ago, an underwater landslide or some similar catastrophe buried them. Yet Walcott, who spent years studying these strange creatures, was determined to classify them as primitive ancestors of existing animals. Convinced that evolution was both linear and progressive, Walcott had no choice but to "shoehorn" his bizarre finds into existing categories.

Now let a half-century pass (not much time, after all, when you're dealing in billions of-years), and in 1972 three Cambridge University paleontologists—Harry Whittington, Derek Briggs, and Simon Conway Morris—decide to take a new look at the Burgess Shale fossils. They bring to the task new "theories about the basis of natural order" and a healthy appreciation of chance and catastrophe in nature's course. Aided by new techniques for reconstructing the shapes of crushed fossil forms in three dimensions, they find not Walcott's traditional arthropods and mollusks but a myriad of unimagined forms. In *Wonderful Life*, Harvard biologist Gould shows how this reclassification undermined the old Darwinian assumptions. "The history of life is a story of massive removal followed by differentiation within a few surviving stocks," says Gould, "not the conventional tale of steadily increasing excellence, complexity, and diversity." The Burgess Shale is thus appropriated as evidence for the theory of evolution which Gould espouses, called "punctuated equilibrium": Contingency, as much as "survival of the fittest," determines evolution. When a catastrophe occurs, when an ice age commences or an asteroid plows into the planet, some species perish and the luckier survive.

Gould writes for non-specialists, and he makes the Tale of the Shale an entertainment. But besides the entertainment is the sobering reminder of how scientific theories make facts quite as often as facts make scientific theories. By revealing how, in the Burgess Shale interpretation, intellectual climate was as influential as actual evidence, Gould challenges the comfortable notion of science as being strictly scientific, an objective ordering of facts.

MACHINES AS THE MEASURE OF MEN. Science, Technology, and Ideologies of Western Dominance. *By Michael Adas. Cornell. 430 pp. $29.95*

When Europeans in the early 16th century ventured to far-off places such as China, India, and Africa, they were fascinated by the tools and weapons they found. But, from the earliest contacts, the European explorers judged these devices inferior to their own technological instruments. Such a comparison was not innocent; nor was it without political consequences. As Adas, a Rutgers historian, relates, "scientific and technological measures of human worth . . . dominated European thinking on issues ranging from racism to colonial education" for centuries and served as the irrefutable justification for the "civilizing-mission" ideology that led to Europe's global hegemony in the 18th and 19th centuries.

Instead of admiring China for its refined culture, Europeans viewed the "Chinese failure to develop the full potential of such key inventions as gunpowder and paper" as an indictment of the stifling, "despotic Chinese government." By the same token, the "perceived lack of inventiveness and scientific curiosity on the part of the Africans" allowed Europeans to consider them as biologically inferior, an attitude