

his concern for maintaining and respecting inner and outer space on nature's terms.

Although in *Epitaph for a Desert Anarchist*, James Bishop Jr. looks at Abbey and his impact on the American conscience through his writings, the memoir is colored with anecdotes collected by his family and friends. While the author emphasizes that the book is not an "academic study" of Abbey's works, the chapters pursue and portray the man and his philosophy through his publications.

Known for his commitment to environmental protection, Abbey served as a seasonal ranger for 17 years. Written in the late 60s, the essays of *Desert Solitaire* recount his experiences with the natural life at Arches National Monument in Utah and the insensitive human invaders. Motorized tourists, completely unaware of the terrain, the indigenous life, or the requirements to survive in the desert, crept out to mark their existence and to demonstrate their domination over the landscape. Fearful of the consequences to the sacred lands caused by an onslaught of industrial tourists, Abbey was one of the first to delineate three possible solutions for saving our national heritage. His suggestions were simple:

1. Outlaw cars within the national parks—wilderness areas, which, like cathedrals, must be respected as such.
2. Build no new roads in national parks.
3. Put park rangers back to work as naturalists.

Like many sages who speak before the paradigm shifts, his remedies were ridiculed. With time the first two of his suggestions are being implemented, but unfortunately in the meanwhile, the role of the ranger has become bureaucratized and militarized. This past spring I visited Arches and the north rim of the Grand Canyon, areas once renowned for their solitude and isolation, but these areas are now infested with commercial ghettos that cater to the air-conditioned comfort and gluttony of the city denizen.

In his novel, *The Monkey Wrench Gang*, Abbey portrayed a bunch of civilized misfits who take on the sisyphian task of "battling the forces of environmental havoc." Enraged at the natural destruction caused by the construction of the Glen Canyon dam, designed to provide cheap electrical power for places like Las Vegas, Los

Angeles, San Diego, and other Southwest cities, Abbey's gang sought to resuscitate the natural vigor of the Colorado River by amputating this artificial implant. The book served as a manual for environmental activists whose practices Abbey approved, yet he himself did not engage in such exercises.

Published in 1956, *The Brave Cowboy* represents the free spirit of the Old West in the form of the hero who practices his individual morality that conflicts with rigid bureaucratic rulings. Fighting the encroachment of industrial conformism, the hero is eventually physically overpowered by technology, yet his spirit survives. The film "Lonely Are the Brave" with Kirk Douglas was based on this book and it remains one of the most moving and haunting films I have ever viewed, portraying the clash of the human spirit against the amoral constraints of the powerful state.

Abbey as a writer, like Escher the artist, was fascinated by the paradoxes inherent in life. Unlike Escher, Abbey displayed many of the basic contradictions that make us human and his behavior as a curmudgeon made him either much loved or hated. Abbey provoked his audiences and his rebellious remarks were often said for effect. As a contemporary writer, Abbey deserves accolades as one who raised the public's "consciousness about the importance of individual responsibility and taking action, and about the value of all living things."

This is a book that celebrates a man who "represented the best of the American dream" and salutes him "for his humanism in trying to shock readers into recognizing their actual place in nature." Abbey's story deserves to be read by students who should be reminded that we are all part of nature and that in working to preserve the natural world, we also work to insure our own spiritual and physical survival. We need to be reminded of the personal integrity represented by the spirit of Edward Abbey, just as we need a buzzard to shake us out of inertial conformity. Even now, many of his admirers see Abbey in the resurrected form of the vulture he so admired, watching the show below as he soars in the sky.

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THE MIND

Receptors. 1994. By Richard M. Restak. Bantam Books, Inc. (666 Fifth Avenue, New York, NY 10019). 228 pp. Hardback \$23.95.



Written by a practicing neurologist who displays an irrepressible curiosity about the brain along with a passionate desire to communicate his enthusiasm to the general reader, **Receptors** proves to be a very stimulating and readable book covering what is currently being discovered in the molecular world of neurotransmitters and receptors. In his preceding book, **The Brain Has a Mind of Its Own**, the author attempted to describe the workings of the anatomical brain; in this latest publication he probes the inner actions of our central computer by attempting to focus at the submicroscopic level.

In a series of 16 chapters, each written in essay form, the reader is introduced to the newer ways of thinking about brain mechanics, its manifestation in what we term the ruling mind, and finally the exposure of cerebral manipulations through our moods, emotions and behaviors. Bypassing the anatomical mappings and ignoring electrical readings to interpret the brain, neuropsychiatrists now concentrate on the chemical interactions at the molecular level that appear to drive thoughts and emotions. The four chemical types of neurotransmitters are described—from simple amino acids, the monoamines, and acetylcholine, to a heterogeneous cluster of various endorphins, nitric oxides, and lettered substances—along with their actions and locations in the brain.

Each chapter begins with a historical review of what is known about mind altering drugs and is further enriched with clinical sketches of the actions of these drugs which are classified as Euphoriant, Phantasticant, Inebriant, Hypnotic, and Excitant. For example, extracts made from the plant henbane have been used in different circumstances to achieve different outcomes, it can be applied to induce prophetic powers or to eliminate adversaries, "Both Hamlet's father and the Roman emperor Claudius were killed by surreptitiously supplied henbane." The chemical LSD is described along with its relationship to the psychotic component found in ergot plant fungus. Modern psychopharmacology is said to have been opened by the serendipitous discovery of the

antimanic effects of lithium on depressed patients.

Antipsychotic agents such as chlorpromazine and reserpine are described in the treatment of mental illness. Depression is defined as deficiencies of certain neurotransmitters at brain synapses, thus the therapeutic significance of the reuptake-blocking action of the tricyclic antidepressants on norepinephrine and serotonin points to the involvement of more than one neurotransmitter affecting this condition.

Nicotine, which may have originated as a plant insecticide, works on its human consumer by releasing endorphins that the mind perceives with pleasure, and dopamine, which serves to reward the user with lowered anxiety and lessened irritation. Yet this drug yields addictive control on the brain, and nicotine withdrawal is considered to be a brain disease. Those arousing xanthine drugs found in coffee, tea, chocolate and cola are commonly known as caffeine, theophylline and theobromine, and provide mood elevations by triggering the release of norepinephrine in the brain. Angel dust or PCP was originally synthesized to serve as an anesthetic, but this chemical was found to induce schizophrenic-like psychoses and other adverse effects. Yet PCP is now being studied as the type of chemical that could help prevent the harmful consequences of stroke damage. Cocaine, heroin, amphetamines, marijuana and many other drugs are detailed along with their known action at synapses or with neuronal receptors, and the author emphasizes that these mind and brain altering drugs have limitless potential for both good and harm.

Through this series of essays the reader can easily and enjoyably follow the direction of research in the realm of neuropharmacology. While the author states, "Studies of neurotransmit-

ters and receptors reveal that events within the brain involve a chemical dialogue, a conversation in which chemicals talk to each other," the reader is impressed by how little we understand of this language. Restak tries to make sense of this chemical communication chatter that takes place in the brain and to construct a dictionary of meanings from the evidence we now have. Truly, we seem to have burst into the 'prozac' age of employing drugs to influence mood, creativity, behavior and attitude. First we must know how these chemicals work in the brain, how these molecules manipulate behavior, and perhaps most fundamentally how our own actions and interactions affect the natural productivity of such neurohormones and how the substrate cells react with them. This book shows how much still must be learned at the molecular level of the brain, but it points to some of the directions being followed in these pioneering ventures into chemical exploration of the brain.

This is an exciting topic that should appeal to a wide audience, from high school students to educators to interested novices.

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GENETIC ENGINEERING

An Introduction to Genetic Engineering (1st ed). By Desmond S.T. Nicholl. 1994. Cambridge University Press (40 W. 20th St., New York, NY 10011). 149 pp. Hardback \$39.95; paperback \$16.95.



This textbook is an easy-to-read, well-written, basic introduction to genetic engineering.

The text is a simple, logical and concise presentation of the What, How

and Why of genetic engineering. The author addresses the What of genetic engineering by providing a definition and a history including the basic molecular biology principles leading to the emergence of genetic engineering. The How of genetic engineering includes a discussion of the tools required as well as a variety of enabling technologies for using the tools successfully. The Why of genetic engineering addresses the use of genetic techniques to expand the database of molecular knowledge as well as the benefits, real and potential, to be derived from application of these techniques. In addition, the ethical scientific questions arising from the use of genetic engineering are addressed at relevant points throughout the book. The author stresses the importance of dialogue between scientists and regulators and the need for informative, persuasive communications between the scientist/regulator and the public.

The use of concept maps at the end of each chapter provides a concise summary of material presented in the chapter. These maps can be invaluable to students and to instructors in providing a cohesive introduction to material in the chapter as well as a comprehensive review of material contained in the chapter.

The concise nature of the book, the glossary and the provision of a limited number of texts for further reading result in a "student-friendly" introductory text for undergraduate students. This book will also be valuable as a review of genetic engineering basics for graduate students and medical students and as an introduction to genetic engineering for others interested in this emerging field.

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