MODELS IN CHEMICAL SCIENCE
An Introduction to General Chemistry

By George S. Hammond, Janet Osteryoung, Thomas H. Crawford, and Harry B. Gray

W. A. Benjamin, Inc. .......... $10.95

Reviewed by David H. White
Graduate fellow in chemistry

Models in Chemical Science is a successful attempt to present chemistry at the introductory level as a human intellectual process instead of the authoritative every-question-has-a-right-answer approach common to undergraduate textbooks. The thesis of the authors is that "everyone in science uses models in thinking about experimental data. We scientists tend to focus not on the real thing but on the behavior of our own mental constructs."

Hammond, Osteryoung, Crawford, and Gray believe that reality is always more complex than we can visualize or even fully understand. Thus, we use models, or theories, which are always approximate and tentative, and may have to be revised or discarded as new evidence is found.

This is a concept that few students encounter until they reach advanced studies (if, indeed, they ever encounter it at all) when it comes as a shock to realize that science doesn't provide any sure answers. So this book is welcome, as is any presentation which shows science as a fallible, open-ended, human enterprise instead of a superhuman certainty. Such an orientation encourages a healthy questioning of established ideas and established experts, and is necessary to understand the basic nature of science.

The only mathematical background required for understanding this book is algebra, and mathematical derivations are minimized but not avoided altogether. Difficult topics such as thermodynamics and reaction dynamics are clear and understandable. Organic and inorganic examples are combined to illustrate many concepts in a way that makes them both seem integral parts of the whole of chemistry.

One especially colorful example is used to illustrate a number of concepts in reaction dynamics. Two tennis players, George and Eileen, take 1,000 tennis balls to the court but forget their rackets, so they make up a game. Starting with 500 balls in each court, each begins picking up and throwing the balls on his side over to the other side as fast as possible. They soon reach a dynamic equilibrium, resembling many chemical reactions.

The book is designed for non-chemistry-major students who have never taken a chemistry course before and will probably never take another, and it serves this purpose well. It de-mystifies science while presenting a solid enough background to understand what chemistry is and to begin to cope with the increasing numbers of chemical problems appearing in the newspapers every day. Regrettably, the discussion of "relevant" topics, such as air pollution and drugs, is rather sketchy and undetailed. However, the authors do a fairly thorough job of presenting the theories that chemists actually use in their work.

Perhaps the book would also be useful as a high school text. Those students bound for scientific majors in college would be well prepared by it to handle the concepts and the more rigorous techniques of a college chemistry course.

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OSCAR MANDEL'S COLLECTED PLAYS,
Volume 1

Reviewed by J. Kent Clark
Professor of English

In some ways, the drama of Oscar Mandel (Caltech professor of English) seems too intelligent, witty, polished, and literate to be contemporary. Its crisp, tight organization, its clear definition of dramatic issues and characters, and its cool satirical edge sometimes seem closer to the world of Molière than to the worlds of Miller, Albee, Beckett, Ionesco, and Pinter—to say nothing of the murky worlds of the now theater. It is not neurotic, psychotic, confessional, guilt-ridden, sex-ridden, or absurd; it avoids merely topical "relevance" as it would adolescent acne. Furthermore, the setting of the plays is often remote from the contemporary scene: Homeric Greece, Saxon England, Roman Spain. And even settings that are ostensibly modern have been removed by at least one level of abstraction from naturalistic realism.

Finally, Mandel's plays show a sense of style—the incisive word, the deceptively "inevitable" phrase, and the subtly poetic speech—that is almost unknown in contemporary American drama. This stylistic artistry, it should be added, not only makes the plays delightful to read or hear but also serves in classical fashion to keep the proper dramatic distance between the audience and the characters.

But if the style, the angle of approach, the restraint, the finish, and the organization of Mandel's plays derive from the classical European tradition, the subject matter and the psychological concerns of his drama are the preoccupations of twentieth century humanity: loneliness (cosmic and personal), war, death, moral responsibility, idealism, and general human cussedness. Paradoxically enough, Mandel, with his ironic detachment and his scorn for passionately topical drama, writes plays of wider relevance and more genuinely modern substance than do many relentlessly contemporary playwrights. His General Audax, for example, though set in Spain about 140 B.C., has more to say about the issues raised by twentieth century existentialism than Sartre's Dirty Hands, which has already
become a preachy period piece of the
1940's. Similarly, Mandel's Island,
though it never mentions the word
"scientist," examines the human problem
of the scientist and the military in more
philosophical and emotional depth than
does In the Matter of J. Robert Oppen-
heimer.
In such plays, of course, Mandel is
obliged to pay the price for removing his
drama from the naturalistic contempo-
rary scene. He must devote more time
and ingenuity to exposition—to setting
up situation and character; he must get
along without stock audience responses,
topical references, and local color; and
he must trust his audience to make the
connections between timeless dramatic
action and current dilemmas. The fact
that he can pay this price and still pro-
duce effective, moving drama testifies to
his skill as a writer and his sensitivity to
central modern problems.

Whether comic or serious, or both,
Mandel's plays are characterized by a
lively energy. Occasionally, in fact,
Mandel is too lively and inventive for his
own good. His comedies are sometimes
so loaded with wit and paradox that they
are hard to assimilate at a comfortable
speed. The audience is apt to find itself
panting behind the turns of phrase, situ-
atation, and character motivation. This is
particularly true of A Splitting Headache
and The Virgin and the Unicorn. Occa-
sionally, too, his invention lures him into
overdeveloped speeches which impede
the action for the sake of an elegant or
subtle thought. In general, however, he
controls his wit, invention, and rhetoric
remarkably well, with an instinctive
appreciation for dramatic values.

The publication of the first volume
of Oscar Mandell's plays reveals a first-rate,
mature talent. The second volume, which
will be published shortly, should be
equally exciting to devotees of modern
drama.

THE NAME ABOVE THE TITLE
An Autobiography by Frank Capra
The Macmillan Company .......$12.50

Reading Frank Capra's autobiography
is just as good as seeing a Capra movie—
and that's still pretty good. Like a Capra
movie script, it's got everything—action,
suspense, spunk, sentiment, honesty,
patriotism, vitality, gags, guts, good guys
to root for, and bad ones to hope that
they get their just deserts.

The book is, naturally, mainly con-
cerned with Capra's 40-year career in
motion pictures. (He made about 60 of
them.) From the day he bluffed his way
into the business in San Francisco and
made a one-reel film of Kipling's "Ballad
of Pullah Fisher's Boarding House," the
story moves at a breakneck pace through
Frank's days as gag man for Hal Roach's
Our Gang comedies, then for Mack
Sennett, into directing with Harry
Langdon, on to Columbia Pictures and
the great days of Lady for a Day. It
Happened One Night, Mr. Deeds Goes
to Town, Lost Horizon, You Can't Take
It with You, Mr. Smith Goes to Wash-
ington. There was Meet John Doe after
that, and Arsenic and Old Lace, before
World War II, when Frank volunteered
his services, was commissioned a lieu-
tenant colonel by the Signal Corps, and
—against constant opposition—made the
classic series of troop information films,
Why We Fight. Then came It's A Won-
derful Life (Capra's favorite of all his
pictures) and State of the Union, before
a couple of Bing Crosby pictures, a
Sinatra one, a catastrophic remake of
Lady for a Day, and Frank's retirement
from the New Hollywood.

Capra is 74 now, living in La Quinta.
From Sicily when Frank was 6. Everyone
else in the family went to work, but
Frank wanted to go to school. He was
allowed to do this as long as he paid his
own way. So he sold papers, worked as
a janitor, played guitar in a bar, got
through high school, saved $700—and
entered Caltech in February 1915. (It
was Throop Polytechnic Institute then.)
The family had a lemon grove in Sierra
Madre by this time, and Frank rode back
and forth to school on a second-hand
motorcycle. He was a waiter in the
campus dorm, ran the dormitory laundry
agency, and worked (for 25¢ an hour
for the night engineer at the Pasadena
Light & Power plant.

His daily routine should make thought-
ful reading for Caltech undergraduates
today:

"This was my twenty-four-hour day: up
at 3:00 A.M. at ranchhouse, lit small bonfire
under motorcycle crankcase to heat up cold
oil. Lit acetylene headlight (about as much
light as a modern flashlight), then pushed
the Flanders down dirt road until single
cylinder sputtered into action; leaped on the
seat and noisily raced eighteen miles in the
dark to the Pasadena Light plant. On rainy
nights, the rides were half-drowned ordeals
of slips, slides, and muddy spills.
"3:30 to 7:30 A.M.: checked boiler fires,
polished miles of metal at the Light plant.
Then raced three miles to school to help
other four waiters wash breakfast dishes for
sixty-five dorm students. Ate breakfast while
working.
"8:00 A.M.: ran to my first class. 11:55:
ran with four other waiters to serve lunch at
dorm; washed dishes, ate lunch while
working. 1:00 P.M.: ran back to class.
"5:00 P.M. to 6:00 P.M.: glee-club or
football. Then set tables, served dinner,
washed dishes, ate dinner.
"7:00 P.M.: jumped on motorcycle, raced
teen miles to Sierra Madre. Last quarter
mile of dirt road was so steep he had to jump off
and push the Flanders. On a rainy night, it
was a wrestling match with a wild steer.
"7:30 P.M.: backed motorcycle into shed,
put paper and sticks under crankcase for
bonfire in morning.
"7:30 P.M. to 10:00 P.M.: study and
homework. 10:00 P.M. to bed. 3:00 A.M.: up
and lit bonfire under crankcase.

"What did this schedule do to my studies?
Nothing. I won the Freshman Scholarship
Prize: $250.00 and a trip around the country,
and the sincere congratulations of my proud
teachers: Dr. Bates (chemistry), Dr. Van
Buskirk (mathematics), Dr. Beckman
(German), Professor Sorensen (electrical
engineering), Professor Clapp (geology),
and proudest of all, Professor Judy
(English)."
EINSTEIN: THE LIFE AND TIMES
By Ronald W. Clark

World Publishing Company . . . . $15.00

The special distinction of this new biography of Einstein seems to be its bulk. There have been plenty of books about Einstein the scientist, Einstein the public figure, or Einstein the man, but this one deals with all three. The result is a massive book of more than 700 pages. Obviously, the book involved an enormous amount of research, and in trying to cram it all in the author often creates considerable confusion.

Mr. Clark is a British writer who has produced a number of books on scientific subjects—including The Birth of the Bomb, and biographies of such British scientists as J. B. S. Haldane, the Huxleys, and Sir Henry Tizard.

As a non-scientist, Mr. Clark makes Einstein's scientific contributions fairly comprehensible to an interested layman—and his accounts should not unduly outrage any physicist readers.

In dealing with Einstein the man, Mr. Clark has to deal with the fact that Einstein always went to great pains to keep his private life just that. (“When a man after long years of searching chances upon a thought which discloses something of the beauty of this mysterious universe,” Einstein once said, “he should not therefore be personally celebrated. He is already sufficiently paid by his experience of seeking and finding.” And again: “Personally I consider it indecent to delve into people’s private affairs and trifles.”)

Mr. Clark, then, has to rely pretty much on the printed record, and his comprehensive research uncovers the trifles along with the important events in Einstein's life (including the familiar, and possibly apocryphal, trifle concerning the Einsteins' visit to Mt. Wilson, where Mrs. Einstein was told how the big 100-inch telescope was needed for extending the structure of the universe. “Well, well,” she replied, “my husband does that on the back of an old envelope.”). A considerable portion of this biography is devoted to the public Einstein and his attempts to deal with such social and political problems as pacifism, Zionism, and the atom bomb. But the particular interest for Caltech readers will probably be in the accounts of Einstein's two visits to the Institute in 1930 and 1932. Even though he does refer to Caltech's predecessor as "Troop College of Technology," and locates the Mt. Wilson Observatory "high in the Sierra above Pasadena," Mr. Clark provides some interesting glimpses of life at Caltech in the early thirties, and an intriguing, gossipy account of some "financial sleight of hand" by R. A. Millikan and Arthur Fleming—which apparently caused Einstein to turn down a permanent position at Caltech.
Girish Karnad, Collected Plays Vol 1, author, actor, ex-OUP editor. Girish Karnad, a playwright, film-maker, and actor, writes in Kannada and has translated his plays into English. The International Theatre Centre of UNESCO, Paris, has declared him the World Theatre Ambassador of the International Theater Institute, Paris. He has been honoured with the Padma Bhushan and was also conferred the prestigious Jnanpith and Sahitya Akademi awards. He provided the voice of A.P.J. Abdul Kalam, former President of India, in the audiobook of Kalam's autobiography by Charkha Audiobooks Wings of Fire. A play-by-play breakdown of Oscar winners and all the biggest moments of the night. She plays Fern, a headstrong woman who takes to the open road after the death of her husband and the collapse of the Nevada factory town. McDormand previously nabbed best actress honors for her acclaimed performances in the 1996 classic “Fargo” and “Three Billboards Outside Ebbing, Missouri.” Last Pages brings together some of the most thought-provoking and engaging works of Oscar Mandel, a noted Belgian-American playwright, essayist, poet, fiction writer, and scholar. Comprising essays, a novella, a one-act play, and poetry. Last Pages dances through Mandel's archives with wit, sharp intelligence, and sometimes controversy, as with his essay on Judaism, “To be or not be a Jew.”