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other and assemble. He suggests a similar character for the
formation of organs. As Monod sees it, a specific molecular
action may be described as one in which the state of many
inputs will determine an output state, which will itself control
power amplifier. The control is not much more complicated
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rol system uses a purely formal language. At succeeding levels
(e.g., organs) there will still be dependence on molecular processes
based on proteins, again with a machine language.
As his ultimate reduction Monod points out that the genetic
code begets the genetic code, i.e., the 4 unit nucleotide language of
DNA codifies the amino acid chains, which fold themselves
into geometric specific proteins, which furnish the geometric
specific enzymes, which govern the chemical direction of life
processes. Furthermore the code provides the specific nature of
life's invariant reproducibility.
The code is changed only by chance, by mutations. The ex­
erential content of life provides a selection pressure for evolu-
tion. To prepare for the transition to the problem of living
organization at the level of man, Monod points out that at higher
levels of organization (e.g., the organism) two frontier
problems still persist: the origin of life, how the code itself
could have come into existence; and how chance and selection
pressure could lead to the complexity of the higher nervous
ystem.
The first two thirds of the book are concerned with outlining
Monod's molecular thesis. How the genetic code expresses
itself is elegantly told. Then the last third of the book explodes
with the germ of ideas all latent in Monod's view of the genetic
code. Evolution comes into being as an irreversible process.
Species react to their environments. Their purposive perfor-
ance places a selection pressure on their gene pool. Inevitable
chance mutates the DNA of the genetic material. Selection
pressure, "necessity," selects the course of emergent species
evolution.
Selection pressure on the upstanding australopithecines finally
forced articulate symbolization. Language was born. Thence
culture was born. This in turn created the selection pressure
and survival value of intelligence. Though human behavior
involves elements acquired through experience, they are acquired
by a learning program, the unique characteristic of man's brain.

Cues for man's social behavior are discussed in Monod's last
chapter. Simulation and language made man master of his
environment. Thus man's own species became his only ad­
versary. Tribal warfare became the important evolutionary
factor. Tribal evolution created the need for explanation and
myth. They stabilized his societies. Man otherwise hasn't the
simpler genetic stability of the social insects, whose program of
inheritance is automatic, chemical. We now face the choice of
objective truth (science or knowledge) versus a selection of
values. But ultimately objective truth must be based on a
theory of value. It is an ethical judgment that makes a man act
to acquire knowledge in accordance with objective truth. Man
and man alone can make that choice. It makes man a lonely
creature, devoid of myth. Thus Monod has raced from the
protein molecule to the polities of man's actions in a world with
a future over which man may have some say. Is there any other
significant construct for organization? The reviewers doubt it. The sketch is there; the details, particularly dynamic,
physical, and hierarchical, are not.

**REVIEWED BY A. S. IBERALL and F. E. YATES**

Monod's book contributes a fundamental cybernetic view of
organization of the living system at the primitive molecular
biological level. His first thesis is that reliable and invariant reproduction
precedes purpose in all living systems. Purpose then emerges
by selective evolution. Monod's second major thesis probes how and why protein is the essential molecular agent of purpose.
Monod starts from the fact that specific shape and handedness of protein molecules in solution permits them to recognize each other and assemble. He suggests a similar character for the
formation of organs. As Monod sees it, a specific molecular
action may be described as one in which the state of many
inputs will determine an output state, which will itself control
a power amplifier. The control is not much more complicated
than logic networks currently in use. Monod notes that the con-
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significant construct for organization? The reviewers doubt it. The sketch is there; the details, particularly dynamic,
physical, and hierarchical, are not.

**REVIEWED BY GUY BORNARD**

These two books cover two complementary fields, as the second one aims to "demonstrating the logical cogency of a sys-
tems concept of the world," while the first, which deals with
modeling techniques, gives a useful tool for solving problems
using a systems approach.
Part I of the first book, after a chapter on unpredictability and
random sequences generation, describes the various types of
models used in the fields of engineering design, economics,
nuclear reactor design, queueing and storage, military operational
research, management, and it concludes with design of simula-
tion experiments. Part II presents four case studies: "provision
of standby aircraft", "capacity of an air traffic network,"
"handling operation at a container ship berth", "plant utiliza-
tion and storage," and it includes comments on model building
techniques. An appendix on programming facilities closes the
book.
The interest of this book, which lies in giving a general view
of modeling problems in a wide range of applications, is de-