purblind perseverance in one and
only one goal is likely to herald
professional burn-out.

Hence Boyer would add three
other kinds of scholarship to that
which we most readily acknowledge
in promotion and tenure reviews.
One is integration, the process
whereby facts are put into perspec-
tive, links forged across disciplines,
research carried on at the borders of
adjacent fields. This kind of scholar-
ship may lead to the writing of texts
(which, Boyer is careful to say,
should be rigorously evaluated) and
to addressing more general audi-
ences; it may also lead to non-
conventional forms of "publication,"
such as videos, or to work on the
design of core curricula and cross-
disciplinary studies.

A second is application, the scholar-
ship of professional service outside
the academy directly tied to one's
own field of knowledge. Long en-
bodied in such forms as agricultural
extension and assistance to industry,
it has come in more recent years to
include the social sciences and hu-
nanities: joining theory with practice
in addressing social problems, or
developing a larger public appreciation
for history and the arts. As with
"integration," Boyer feels that the
scholarship of "application" can be
documented if we take the trouble to
design the tools. Here he builds on
the work of scholars like Ernest Lyn-
ton and Sandra Elman, who for
several years have been urging the
necessity for such definitions on the
academy.

The last of Boyer's categories, the
scholarship of teaching, is, I think,
somewhat more problematical. It is
not that what he says is ill-founded,
only that the category does not seem
parallel to the other three. Teaching,
one might think, is the arena in
which all these other forms of scholar-
ship are brought to bear, the mix
depending on the subject matter,
purpose, and level of the course. It
does not itself represent a scholarly
subject, except in the relatively
limited sense of research on peda-
gogy, which is likely to suffer when
thrown into the hopper with other
kinds of research. But his caution is
salutary: "One reason legislators,
trustees, and the general public of-
ten fail to understand why ten or
twelve hours in the classroom each
week can be a heavy load is their
lack of awareness of the hard work
and the serious study that under-
girds good teaching."

Boyer manages to remain sensitive
to institutional differences, conceiving
that there is neither need for, nor
should there be fundamental altera-
tions in, research priorities at major
research universities. His proposals
for reforms in graduate education—
more interdisciplinary work, more
attention to the social and ethical im-
lications of one's discipline, a
broadening of the concept of the
dissertation—are modest and doable; in
the case of better teacher prepara-
tion, much is already being done,
and more good practices could have
been cited. Although Boyer argues
for a need for strong presidential
leadership, he places the primary
responsibility for a change in priori-
ties on the faculty itself, expressing
a concern that "administrative cen-
tralization may be causing faculty gover-
nance to decline at the very moment
higher learning faces the challenge of
renewal."

Unfortunately, Boyer's prescrip-
tion, that "topics such as 'scholar-
ship and its uses' become a matter of
campuswide discussion" in fac-
ulty governance bodies, seems to
derive from a somewhat too roseate
belief that "career prospects are be-
coming brighter and the academy
seems poised for a decade of renew-
al." Presumably written some time
in 1989 or 1990, such a statement
seems to have entered prematurely
the New Yorker's "clouded crystal
ball" category. Many of our institu-
tions are, it is true, short of faculty,
but are also desperately short of po-

tions to fill. The discussions Boyer
and most of us would like to have
are going to face hard weather in
a time of cutbacks and increased reli-
ance on part-time faculty who have
no reason to commit themselves to a
particular institutional culture. Like-
wise with his injunction that many
doctorate-granting institutions "have
not just a national, but more impor-
tant perhaps, a regional [service] mis-
ion to fulfill...." With the best in
stitutional will in the world, a bill
must nonetheless come due; institu-
tions from the K-12 sector up are all
too often told what they must do
without being funded to do it.

If I find any fault with Boyer's para-
digm, it is that while enjoining even
leading research centers to
honor good undergraduate instruc-
tion, he does not devote attention to
the merits of the reverse model.
Many excellent liberal arts colleges,
like those in the ACM (Associated
Colleges of the Midwest) group, en-
joy a high reputation among gradu-
ate schools precisely because their
faculties include highly qualified
researcher-"discoverers" who have
served as mentors for undergradu-
ates. Boyer quotes with evident ap-
proval the remarks of the dean of a
graduate business school at a distin-
guished southern college who says,
"For a large research university with
doctoral programs, traditional re-
search may be appropriate. But for a
school like ours or the many others
where the main work is at the un-
dergraduate or master's level, the
application of knowledge should be
valued more than the development
of knowledge." The statement seems
to me disheartening: is this really a
necessary choice? To propose a
tailoring of the reward system to in-
stitutional mission is one thing; ac-
tively to discourage student access to
a more theoretical research model at
such institutions is quite another,
and smacks of both anti-intellectual-
ism and a short-sighted view of so-
cial needs.

We must not, it seems to me,
open new wounds in healing the
old. Nonetheless, on balance Boyer
says what has needed saying, and
there may still be time, with suffi-
cient public (and therefore political)
support, to move in the direction he
outlines.

How College Affects Students: Findings and
Insights from Twenty
Years of Research

Ernest T. Pascarella and Patrick T.
Terenzini. San Francisco: Jossey-
Bass. 1991, 894 pp, $9.95

LIONEL S. LEWIS

Many Americans have a keen inter-
est in what, if anything, students
learn in college. Parents and tax-
payers want to know what they are
getting for their money. Students
want to know what they are getting
for their time. Academic administra-

Lionel S. Lewis teaches sociology at the
State University of New York at Buffalo.
tors and faculty are uncertain about what programmatic changes might work and how to make undergraduate education work better.

Given a steady stream of news and comment about how poorly higher education has been serving the nation and individuals — we recently learned, for example, that only about half of high-ability high-school seniors go on to receive a bachelor’s degree within seven years of graduating from high school — it is hardly surprising that academics would like to believe that they are doing something truly of value, and that the public continues to accept on faith that a higher education is a prized and necessary commodity.

Thus, since mass public education took hold in the United States after World War II, there have been periodic efforts to synthesize what social scientists have found about the effects of college on students: on their aspirations and how they think, how they see the world, and how they relate to others. Each attempt has been more elaborate than the previous one, but all draw the same vague conclusions. Some learning occurs in college. During college some students change; some do not. Some measured change may be due to maturation or to other factors extraneous to the curriculum. More who change do not change much. All of this could be concluded from Philip E. Jacob’s review in 1957, and it held for Feldman and Newcomb’s in 1969 and for Howard Bowen’s in 1977. No matter how many studies are done or how many times they are reanalyzed or how many ways they are classified, this is about all that can be said.

If for no other reason, the effort by Pascarella and Terenzini will be remembered for its thoroughness. They have ploughed through over 2,500 pieces of research. They are systematic and dogged. They spent five years sifting and sorting, and have produced a book of nearly nine hundred pages. Yet none of this can alter the facts. The conceit of many academics and the gullibility of most of the public notwithstanding, four years of college barely changes the vast majority of students.

It may be useful, but it is also painful to call back to mind this well-established conclusion. In setting out on their project, Pascarella and Terenzini must have realized that they would have to be the bearers of grim tidings. Even the crassest academic hucksters do not make the claim that the quality of undergraduate education has improved since Jacob, Feldman and Newcomb, and Bowen published their studies. It would be too much to expect to find greater differences in 1991 than in 1957, 1969, or 1977. Still, Pascarella and Terenzini do all that they can to shy away from confronting the facts. In trying to convince the reader that the evidence indicates that something does not, they digress and they sugarcoat.

Like their predecessors, Pascarella and Terenzini begin with a fairly clear focus. They are interested in determining whether students change during their college years (net effects), and if so, to what extent the change can be attributed solely to the collegiate experience (within-college effects) and the degree to which it is lasting (conditional effects vs. long-term effects). In addition, they are interested in determining what specific characteristics (between-college effects) and individual experiences and characteristics are related to small or large changes. Oddly enough, their analysis relies more on psychological theories of student development than on what constitute institutions of higher learning to promote development and change. In other words, they are less interested in the institutional qualities than in what it is about individuals that might promote change. But the emphasis on individual student differences obscures how colleges affect students.

The types of change Pascarella and Terenzini look at are, in general, cognitive development and competence, verbal and quantitative skills, subject matter knowledge, attitudes, values, moral reasoning and judgment, personality traits and self-concept. As the chart of their major findings shows, they hardly end with a bang. Certainly the magnitude of change over four, five, or even six years in attitudes and values and psychological development of non-college young adults must be nearly as great.

If nothing else, these findings indicate that faculty and others who have recently become involved in the swirl of controversy surrounding reform of the undergraduate curriculum or “political correctness,” whether on the right or left, clearly have been wasting their time if their concern is that character or kindness or ethics or social consciousness or civility might undergo change. For the most part, students are pretty well inoculated from ideological and intellectual currents; it is only part of an enduring and self-serving mythology that the values and beliefs of faculty are transmitted to, and uncritically adopted by, students. What someone might have heard or read as an undergraduate is unlikely to modify his or her behavior. There is little chance that a course in American pluralism will result in more tolerance or that one in equality and classics, as suggested in Dinesh D’Souza’s Illiberal Education, will broaden those who are forced to enroll.

This is not to deny that something is learned in college, that, as Pascarella and Terenzini point out, students “make statistically significant gains in factual knowledge and in a range of general cognitive and intellectual skills.” This may be reassuring to some, although, as anyone who has ever read a final examination understands, it could not be otherwise. However, the case that college transforms students must rest on something more than that they learned and retain some of what they read or heard.

Toward the end of the volume, Pascarella and Terenzini summarize a line of research that purportedly shows that completing a bachelor’s degree may be the single most important step individuals can take for occupational and economic success. College graduation may indeed have a significant and substantial effect on career choice or lifetime earnings. Yet this says nothing, in spite of what Pascarella and Terenzini imply, about college life.

It will be obvious to many readers of their later chapters that Pascarella and Terenzini have conflated two different issues: how college affects students, and the return on investment for college attendance. It is stretching the point to include the topic of occupational placement because it is in some way affected by college. Moreover, what Pascarella and Terenzini feel we must know about the subject is based on a particular line of research: if they had read more on the topic, they might be less sure of their conclusions. In
### Effects of College: Attitudes and Values and Psychosocial Development

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Strength of Evidence</th>
<th>Magnitude of Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetic, cultural, and intellectual values</td>
<td>moderate</td>
<td>unclear (studies do not allow estimates or evidence too complex to estimate)</td>
</tr>
<tr>
<td>Value placed on liberal education</td>
<td>strong</td>
<td>graduates two or three times more likely to value</td>
</tr>
<tr>
<td>Value placed on intrinsic occupational rewards</td>
<td>strong</td>
<td>small</td>
</tr>
<tr>
<td>Value placed on extrinsic occupational rewards</td>
<td>strong</td>
<td>small</td>
</tr>
<tr>
<td>Social liberalism</td>
<td>weak</td>
<td>unclear</td>
</tr>
<tr>
<td>Political liberalism</td>
<td>strong</td>
<td>unclear</td>
</tr>
<tr>
<td>Civil rights and liberties</td>
<td>mixed</td>
<td>unclear, probably small</td>
</tr>
<tr>
<td>Secularism</td>
<td>weak</td>
<td>unclear</td>
</tr>
<tr>
<td>Gender roles (toward modern)</td>
<td>strong</td>
<td>unclear</td>
</tr>
<tr>
<td>Identity and ego development</td>
<td>very weak</td>
<td>unknown</td>
</tr>
<tr>
<td>Self-concept: academic</td>
<td>strong</td>
<td>small, indirect</td>
</tr>
<tr>
<td>Self-concept: social</td>
<td>strong</td>
<td>small, indirect</td>
</tr>
<tr>
<td>Self-concept: self-esteem</td>
<td>strong</td>
<td>small</td>
</tr>
<tr>
<td>Autonomy, independence</td>
<td>weak to moderate</td>
<td>unclear</td>
</tr>
<tr>
<td>Authoritarianism, dogmatism, ethnocentrism</td>
<td>moderate</td>
<td>unclear</td>
</tr>
<tr>
<td>Intellectual</td>
<td>moderate</td>
<td>unclear</td>
</tr>
<tr>
<td>Interpersonal relations</td>
<td>weak</td>
<td>unclear</td>
</tr>
<tr>
<td>Personal adjustment, psychological well-being</td>
<td>strong</td>
<td>small</td>
</tr>
<tr>
<td>Maturity, personal development</td>
<td>no evidence</td>
<td>unclear</td>
</tr>
</tbody>
</table>

(From How College Affects Students: Findings and Insights from Twenty Years of Research)

Their eagerness to be persuasive salesmen for American higher education, they fail to understand that although college attendance may in fact in some way be related to status attainment, they are explaining merely what college degrees do for people, not what a college education does for character, or psychological makeup, or world view.

In sum, too much has been clouded by Pascarella and Terenzini. Are there long-term effects of college? Yes, they answer, but "the distinctive effects of college tend to persist in large measure as a result of living in postcollege environments that support those effects." Consequently, findings of possible importance are overlooked. They minimize, for example, between-college effects because "the net impact of attending (versus not attending) college tends to be substantially more pronounced than any differential impact attributable to attending different kinds of college," which is an entirely different question.

A growing number of commentators within the academic community have come to accept the premise that the return on investment for education should be measured in both noneconomic and economic terms. These individuals might be pleased to learn that although a college education does not touch students too deeply, completing college appears to help them get ahead. Others will find the fact that college graduates may have more successful careers than nongraduates an irrelevancy. By including material about social mobility and status attainment, Pascarella and Terenzini have not only confused matters, they have also produced a book significantly longer and more complex than necessary. As a result, its only value is as a compendium.

### Partners in Science: Foundations and Natural Scientists, 1900–1945


John Parascandola

Robert Kohler's focus in this book is "the social system of patronage itself: the evolving partnership between patrons and recipients" in the field of science. Although the importance of this patronage in modern science is obvious, Kohler notes that for some historians topics like grant...
