

students' in the conventional manner, but as collaborators with the artists in the investigation of the artistic process, its modern conditions, possibilities, and extreme nature, through discussions and practice." His promise that students would be treated as artistic collaborators is now commonplace. When the California Institute of the Arts opened in 1970, it did not off the question of being an artist until after graduation; its initial catalogue pledged that "on the day he enters, the student is an artist." The question was no longer one of practice, but of being an artist in the eyes of one's peers, and in the mirror. By the time the Los Angeles sculptor Charles Ray repeated the argument in an article for *Spin* magazine on the art boom of the late 1990s, the distinction between being and becoming a professional had blurred: "Most art schools are about students and teachers. UCLA is about artists working as students.... The reason the kids here are getting early success is because they're not art students, they're young artists. Young artists get early success. Students study."

Ray sounds flippant, but he's not wrong. The problem is not that our art schools have nothing to teach young students, but rather that there is no particular thing that needs to be learned. There are no longer any particular set of skills that must be taught in order for art—at least as we have known it for the past century—to be made. Artists are not defined by their talents or their skills, then perhaps it does not matter, as Subjects of the Artist insisted it was, a question of being around them. Or as Harold Rosenberg suggested in his canonical essay "The American Action Painters," a student who tried to describe the concerns and the talk of artists like those on the faculty at the time might be a matter of acting out the role of the artist: "What gives the canvas its meaning is not psychological data but *rôle*...." The student need only act as an artist to become an artist, which is a far more difficult proposition than it sounds when it is no longer clear what the role is, and maybe even more difficult than knowing how to draw.



The Fisherman, by Carl Schuster, inspired by Franz Schubert's song about a fisherman's encounter with a water nymph.

CATCH AND RELEASE

by D. Graham Burnett

John Steinbeck—bitten, improbably enough, by a youthful bug for marine biology—found himself in the spring of 1940 on a chartered sardine boat with the invertebrate taxonomist Ed Ricketts, en route to the waters of Baja California, Mexico, to noodle in the tide pools for unknown life forms. But they were after much bigger game than the specimens they planned to stuff in little jars. At the start of *The Log from the Sea of Cortez*, Steinbeck's book about their "expedition" (or was it a jaunt?), the king of Cannery Row insisted that he and his new pal Ricketts were after nothing less than a whole new way of *learning about the world*. Here's the pitch:

We said, "Let's go wide open. Let's see what we see, record what we find,

and not fool ourselves with conventional scientific strictures." We could not observe a completely objective Sea of Cortez anyway, for in that lonely and uninhabited Gulf our boat and ourselves would change it the moment we entered.

Call it the Heisenberg uncertainty principle of the field trip. Mounting a full-bore attack on bookish objectivity and the closeted university types who went in for it, Steinbeck suddenly turned and gave ichthyologists (of all people) a few good kicks, in a passage that has become legendary among fish biologists and the students who dislike them. The subject is the seemingly innocuous taxonomic technique for identifying

D. Graham Burnett is a historian of science at Princeton University and the author of *Masters of All They Surveyed*. His most recent book is *Trying Leviathan: The Nineteenth-Century New York Court Case That Put the Whale on Trial and Challenged the Order of Nature*.

fish by means of the count of their fin spines—an undertaking Steinbeck casts as the epitome of the desiccated learning of the schools:

[T]he Mexican sierra has “XVII-15-IX” spines in the dorsal fin. These can easily be counted. But if the sierra strikes hard on the line so that our hands are burned, if the fish sounds and nearly escapes and finally comes in over the rail, his colors pulsing and his tail beating the air, a whole new relational externality has come into being—an entity which is more than the sum of the fish plus the fisherman. The only way to count the spines of the sierra unaffected by this second relational reality is to sit in a laboratory, open an evil-smelling jar, remove a stiff colorless fish from formalin solution, count the spines, and write the truth: “D. XVII-15-IX.” There you have recorded a reality which cannot be assailed—probably the least important reality concerning either the fish or yourself.

He and Ricketts, Steinbeck hastily assures the reader, were going to *catch* some sierra—and they were going to *eat them too*, calloused hands still bleeding from the naked line. Now that’s real knowledge, and the manly men that make and share it: no roof, no chair, no books.

It’s a somewhat goofy passage, to be sure, but I had trouble getting it out of my head one hot afternoon in the late summer of 2004, when, standing on a sandy spit in the Sea of Cortez, I landed my first Mexican sierra—a toothy, fifteen-inch torpedo of mercurial muscle speckled with yellow coins. After all, I was myself on what could (only charitably) be called an expedition—as an instructor in a two-week intensive university course on marine ecology. Together with a dozen Stanford undergraduates and a few fellow teachers, I had spent the morning diving one of the very reefs where Ricketts and Steinbeck once plucked tubeworms, mused about metaphysics, and drank warm beer (they did a

lot of this). And I would return after my fishing excursion to our field station—a weathered building of termite-nibbled beams and hewn tuff, erected nearly a century ago as the headquarters of a mining company, but long since abandoned to itinerant biologists—for a lecture about fish genetics in a room lined with formalin jars, each haunted by a lurid piscine sprite.

Despite a certain boozy bravado and slightly woozy postpositivism, Steinbeck had sunk his hooks into some fundamental problems, problems that suddenly stood out sharply against the pink desert hills and cold blue water: What is knowledge, and how do we get it? Why do we go into classrooms, and when must we leave them behind?

Gingerly easing the lure from the lower jaw, I knelt in the shallows to perform the ritual of artificial resuscitation peculiar to sensitive fly-fishermen everywhere: “Hello there, sorry about that, back and forth, let’s get some fresh water through those gills—there we go, off with you...” And then I broke down my rod, shouldered my pack, and started the long hike back around the bay to our camp-style classroom, thinking, as I trudged the strand, about the seminar and the lecture, the field trip and those bleeding hands.

The seminar and the lecture. “Seminar” sounds a good deal like “seminary,” an etymological link that reaches back to the monkish roots of modern liberal learning. Not that there were any seminars in the seminaries. Or in the universities either, at least not until the beginning of the nineteenth century. The pedagogical mise en scène of premodern education was the lecture hall: no inviting table around which minds might meet; rather, a pulpit of sorts, elevated before hard benches. That word “lecture,” too, enunciates its conditions of origin—from the Latin *lego, legere, legi, lectus*, meaning “to read.” A lecture was a “reading,” specifically a reading from a book. In a world before printing, this sort of recitation drew crowds, since only a few folks had books, and their willingness to share them was an occasion to bring a sheaf of paper and a fresh-cut quill.

From a sandy spit in Bahía de los Angeles, it all felt, for a moment, quite different. Could it be that the basic life form of instruction (the lecture) remained unchanged from its archaic condition of textual scarcity convened classroom to a little like ill-lit steno pools of universal adolescents destined for the same glance from the back of a modern classroom where some 60 percent of the students are surfing the Web at any given moment? That the method is well on its way to obsolescence. After all, MIT, Stanford, Berkeley, and plenty of other schools have vibrant great lecturers, making them available. Anecdotal reports suggest, unsurprisingly, that those classrooms are now empty (I’ll be on my iPod, thanks!). With a selection of historical, high-production-value lectures of all fields all available on YouTube, the lecture will very likely cease to be a relevant form of such instruction. We professors are busy from time to time, watching the world change, our big lecture classes dwindle to a trickle of freshmen, but it is not clear what we care. We mostly don’t like lecturing.

What we like are seminars. The seminar, a mate gathering, the texts in evidence, the round table, the promise of a rich life of conversation. So natural to us that we don’t learn that it’s a surprise to compare such scenes are in the history of education. After all, the Peripatetics of Aristotle believed, as their name implies, that investigation happened while walking around chairs around tables for them. The Stoics, the Stoics, had the convenient of the lecture only really began to make sense in the late 19th century—so they, too, would have been surprised for our seminar rooms, absent a few centuries. Finally, the medieval magister wondered at the idea that any form of learning could proceed by open-ended exchange. If a student spoke, it was to ventriloquize a rehearsed position in a formal setting. To muse about what came to mind was to muse about what came to mind. Virginia Woolf’s *A Room of One’s Own*

s). And I would return after my fish-
sion to our field station—a weathered
of termite-nibbled beams and hewn
ted nearly a century ago as the head-
of a mining company, but long since
ed to itinerant biologists—for a lecture
a genetics in a room lined with forma-
ach haunted by a lurid piscine sprite.
pite a certain boozy bravado and
woozy postpositivism, Steinbeck had
hooks into some fundamental prob-
blems that suddenly stood out sharply
he pink desert hills and cold blue wa-
t is knowledge, and how do we get it?
we go into classrooms, and when must
them behind?

gerly easing the lure from the lower
felt in the shallows to perform the
artificial resuscitation peculiar to sen-
fishermen everywhere: "Hello there,
ut that, back and forth, let's get some
er through those gills—there we go,
ou..." And then I broke down my rod,
d my pack, and started the long hike
and the bay to our camp-style class-
inking, as I trudged the strand, about
ar and the lecture, the field trip and
eding hands.

Seminar and the lecture. "Seminar" sounds
od deal like "seminary," an etymologi-
at reaches back to the monkish roots
a liberal learning. Not that there were
ars in the seminaries. Or in the uni-
ther, at least not until the beginning
teenth century. The pedagogical mise
f premodern education was the lecture
iting table around which minds might
er, a pulpit of sorts, elevated before hard
that word "lecture," too, enunciates its
of origin—from the Latin *lego, legere*,
meaning "to read." A lecture was a
pecifically a reading from a book. In a
e printing, this sort of recitation drew
ce only a few folks had books, and
cess to share them was an occasion
f of paper and a fresh-cut quill.

From a sandy spit in Bahía de los Ánge-
les, it all felt, for a moment, quite insane: How
could it be that the basic life form of university
instruction (the lecture) remained more or less
unchanged from its archaic condition, in which
textual scarcity convened classrooms that were
a little like ill-lit steno pools of unbathed medi-
eval adolescents destined for the priesthood? A
glance from the back of a modern lecture hall,
where some 60 percent of the students will be
surfing the Web at any given moment, suggests
that the method is well on its way to extinction.
After all, MIT, Stanford, Berkeley, Purdue, and
plenty of other schools have videotaped their
great lecturers, making them available online.
Anecdotal reports suggest, unsurprisingly, that
those classrooms are now empty ("I'll watch it
on my iPod, thanks!"). With a selection of theat-
rical, high-production-value lectures in an array
of fields all available on YouTube, the university
will very likely cease to be a relevant venue for
such instruction. We professors fret about this
from time to time, watching the enrollments of
our big lecture classes dwindle to friendly hand-
fuls of freshmen, but it is not clear anyone really
cares. We mostly don't like lecturing anyway.

What we like are seminars—the inti-
mate gathering, the texts in everyone's hand,
the round table, the promise of a certain kind
of conversation. So natural to us is this style of
learning that it's a surprise to consider how re-
cent such scenes are in the history of education.
After all, the Peripatetics of Greek antiquity
believed, as their name implies, that intellectual
investigation happened while walking—so no
chairs around tables for them. And their crit-
ics, the Stoics, had the convenient idea that one
only really began to make sense of things *lying
down*—so they, too, would have found little use
for our seminar rooms, absent a lot more couch-
es. Finally, the medieval magister would have
wondered at the idea that any form of education
could proceed by open-ended exchange—if his
students spoke, it was to ventriloquize a carefully
rehearsed position in a formal disputation, not
to muse about what came to mind while reading
Virginia Woolf's *A Room of One's Own*.

But historians of education have recon-
structed how we got going on the round-table
pedagogy of the seminar. It was (in the story-
book version) a clique of romantic German
philologists in Göttingen around 1790 who
first rearranged the benches in the classroom,
and, in doing so, the very idea of intellectual in-
quiry. Sure, there had been charismatic teachers

Repetition is the mother of education.

—Jean Paul Richter, 1807

before that, and long evening chats in the spirit
of Socrates, but for most of European history,
"learning" meant reading the books. Since there
weren't many of them, and since they were a
mess (full of copyist's errors and corruptions), a
professor's job was to tell you what they said. For
this you went to lecture. By 1790, however, ev-
eryone could peruse a cheap and serviceable edi-
tion of Livy, and so what Livy actually wrote was
no longer a very interesting question, even for
a classical philologist. But a new problem arose
very quickly: What the hell did Livy *mean*? Or,
to put it a different way, now that we all had
the book in front of us, how come we couldn't
agree about what it said? Thus the seminar was
born—as a site for interpretation, as a new space
for the triangulation of self and text, as an altar-
in-the-round for the sacrament of uncertainty.

The fieldtrip and the bleeding hands. Those
German romantics liked the woods. They
liked mountain tops. Eventually they even liked
the beach—preferably near Naples, and ideally
where there were some ruins, among which they
could take out their Livy, arrange themselves
under that Latin sun, and really *feel* it.

The idea that knowledge is acquired in the
"field"—on site, under the open sky, and not in
the library or the university—was born and reared
in the age of empire, which connected travel and
learning in radical new ways. It was the nascent
natural sciences that insisted most volubly on their
being excused from school: young Darwin, liber-
ated from the tedium of cramming Latinity at

Cambridge, took a glorious ramble with his geology professor through Wales, swinging his hammer and thinking about the structure and history of the globe. He would continue those reflections to considerable effect on the ur-field trip—the five-year circumnavigating voyage of the *Beagle*. Setting sail from Plymouth in December 1831 at the tender age of twenty-two (and under a captain only a few years his senior), Darwin shook the library dust from his waistcoat, breathed deep of the salt air, and vomited like a geyser (it turned out he was enormously susceptible to motion sickness). No matter. He was following in the wake of his hero, Alexander von Humboldt, the titanic German explorer-naturalist-romantic who had tramped through South America a few decades earlier, and raised thinking in the field to a high art. Like him, Darwin would sit beneath spreading palm trees in the tropics and moon about the meaning of nature.

Though Darwin missed Baja for the most part (crossing the Pacific below the equator), we would on this trip retrace his spiritual trajectory, arranging ourselves under a wispy salt cedar to read excerpts from his *On the Origin of Species*. The aim: to consider, seminar-style, not only what this young naturalist saw in his peregrinations but also how his peregrinations helped him see. Here was the uncertainty principle of the field trip on magnificent display, and a traveler who knew—swatting with his bare hands little birds made fearless by generations on an uninhabited island—that by going into the world, he was absolutely changing it. Indeed,

the changing of the world was what the travel helped him grasp in a revolutionary way.

Camped in the pampas, climbing volcanoes, weathering a Cape Horn storm, one learned not merely with books but with the body: with tongue and thumb, ear and arm. There is a famous anecdote about Darwin's return to England: his father, a distinguished doctor, looked up from the breakfast table at the young man and announced, "Why, the shape of his head is quite altered!" For a devotee of phrenology, this was saying something specific about his son's intellectual development, but Darwin senior was also saying that he saw a body transformed by the labor of learning. And this was a commonplace of the traveler, who returned marked by his experience: snowblindness and scars, malarial fevers and tattoos. These were the stigmata of those who suffered for what they knew. They would lord it over the schoolmen for the rest of their lives.

Back at the field station, the sun has dropped behind the stony crest of the peninsula. Students lie here and there on wooden cots, some sleeping, some reading from the course packet, some staring out at the sea, watching the birds dive for herring. Through the open doorway of the station house I can see my colleague setting up for lecture, arranging the benches around the makeshift lectern, and shuffling his notes. It is time, once again, for class. Today's lesson: speciation among the bony fishes.

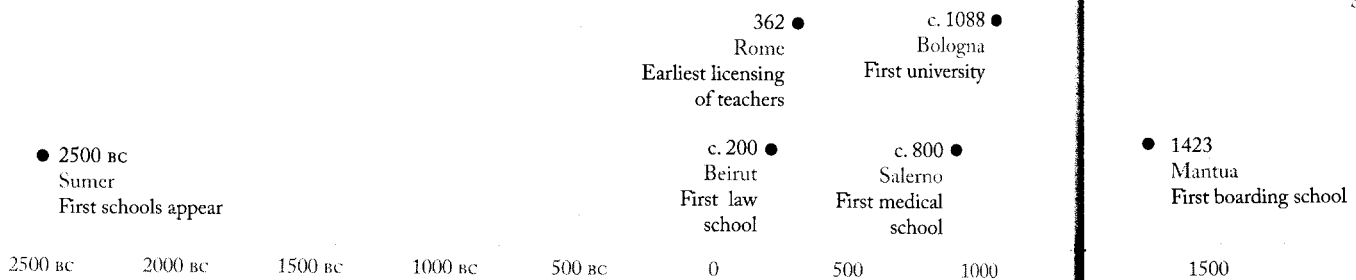
This morning, though, at sunrise, we split the glazed sea in a pair of Pangas, riding out to

the channel to watch a pair of B... lunge into boils of bait fish and ba... at the surface, the fizzy hiss of ti... fry; then, the slashing irruption o... in pursuit; and finally, terrifying... a columnar explosion as the whal... the center of the whirlpool—lea... up in a giant gulp, its baggy lower... ed with water and life.

What did we learn from this... I cannot say, but I do know that... passes for knowledge can now be... is already changing the university, si... dent with a laptop can check every... lecture in real time, and anyone bo... can take a moment to price tick... Boca. Where it will eventually lea... point in the proceedings, anyone's g... wonder, though. If the revolution... ing press wrested the seminar out... hall (installing collaborative herme... place of ex cathedra orthodoxy), th... electronic revolution will flush the... doors, returning us, in a way, to th... condition of the Peripatetics, those... when it was time to teach a

Already classes like ours, "fie... an increasingly important compo... curricula. And this is more, I thin... to satisfy our consumer-students... for credit. Yes, there are the bo... Florence and the cruise-ship sen... coddled (students and parents al... are also serious efforts being ma

A Short History of Schooling



ng of the world was what the travel
grasp in a revolutionary way.
ed in the pampas, climbing volcanoes,
a Cape Horn storm, one learned
with books but with the body: with
thumb, ear and arm. There is a famous
out Darwin's return to England: his
tinguished doctor, looked up from the
ble at the young man and announced,
shape of his head is quite altered!" For
of phrenology, this was saying some-
fic about his son's intellectual develop-
Darwin senior was also saying that he
transformed by the labor of learning.
as a commonplace of the traveler, who
arked by his experience: snowblind-
ars, malarial fevers and tattoos. These
gmata of those who suffered for what
They would lord it over the school-
rest of their lives.

the field station, the sun has dropped
d the stony crest of the peninsula. Stu-
ere and there on wooden cots, some
ome reading from the course packet,
ng out at the sea, watching the birds
rring. Through the open doorway of
house I can see my colleague setting
ure, arranging the benches around
hif lectern, and shuffling his notes.
once again, for class. Today's lesson:
among the bony fishes.
orning, though, at sunrise, we split
sea in a pair of Pangas, riding out to

the channel to watch a pair of Bryde's whales
lunge into boils of bait fish and baby tuna. First,
at the surface, the fizzy hiss of tight-schooled
fry; then, the slashing irruption of the skipjack
in pursuit; and finally, terrifying and glorious,
a columnar explosion as the whale breached in
the center of the whirlpool—leaping straight
up in a giant gulp, its baggy lower jaw distend-
ed with water and life.

What did we learn from this? I am afraid
I cannot say, but I do know that much of what
passes for knowledge can now be Googled. This
is already changing the university, since every stu-
dent with a laptop can check every fact offered in
lecture in real time, and anyone bored in seminar
can take a moment to price tickets to Cabo or
Boca. Where it will eventually lead us is, at this
point in the proceedings, anyone's guess. One can
wonder, though. If the revolution of the print-
ing press wrested the seminar out of the lecture
hall (installing collaborative hermeneutics in the
place of ex cathedra orthodoxy), then perhaps the
electronic revolution will flush the seminar out of
doors, returning us, in a way, to the pedagogical
condition of the Peripatetics, those who knew to
wander when it was time to teach and learn.

Already classes like ours, "field classes," are
an increasingly important component of many
curricula. And this is more, I think, than a move
to satisfy our consumer-students with vacations
for credit. Yes, there are the boondoggles in
Florence and the cruise-ship semesters for the
coddled (students and parents alike), but there
are also serious efforts being made to turn the

university inside out: to send Ethics 101 into the
emergency room; the politics class to Newark; the
budding economists to the Lower Ninth Ward;
and yes, the biologists to Baja. These courses can
be demanding and memorable—occasions for
camaraderie, fear, fecund lassitude, surprise, and
the forms of Eros that originally animated the
desire to know. The glory of such a class, when
it works, is the unexpected linking of head and
hand, of body and mind, of teacher and student,
of knowledge and experience. In a world where
learning can mostly be downloaded, real thinking
requires strategies for escape.

I take a quick dip before heading into lec-
ture, and the water is punitive, icy, invigorating.
One more time I shake the Steinbeck through
my head: his juxtaposition between the fish in the
hand and the fish in the jar was never quite right.
We don't need manly fishermen in the ponds of
knowledge (snagging and gobbling); neither do
we need pedants of the known (hoarding their
decomposing booty). After all, these seeming
antitheses are more alike than different: both are,
in the end, techniques of amassing; both are, in
the end, greedy and possessive; both are, in the
end, stuck in their ways. Neither knows how to
come and go, how to touch things lightly, how to
leave the best for others, how to look sideways,
how to slip away. What we really need is some-
thing like the pedagogical equivalent of catch
and release: "Hello there, sorry about that, let's
get some fresh water through those gills, back
and forth—there we go, off with you...." This
could well be the future of higher education.

