In Puris Naturalibus

Reviewed by Lewis Pyenson

For people with a career at a university lacking a faculty club, the Institute for Advanced Study at Princeton seems like the land of Cockaigne. Scholars and scientists paid to think. A physicist freed from lecturing to legions of pre-medical students; a historian who need not continually explain the origins of the First World War to future tax accountants and divorce lawyers. Subsidized lunch, civilized tea. The institute is a place where one can imagine crossing the path of Hesse’s Joseph Knecht or Marlowe’s John Faustus. Or one might watch, as Leopold Infeld recalls in his autobiography Quest, Tullio Levi-Civita and Albert Einstein discussing gravitational waves: “the calm, impressive Einstein and the small, thin, broadly gesticulating Levi-Civita as they pointed out formulae on the blackboard and talked in a language which they thought to be English”, with “Einstein pulling up his baggy trousers every few seconds.” By focusing on Abraham Flexner, the central actor in establishing the institute, Pursuit of Genius recounts how the institute came to enjoy its reputation.

Bankrolled by the Bamberger-Fuld department-store fortune in the early 1930s, Flexner began with the notion of an elite graduate student university, a combination of the Johns Hopkins University and the Rockefeller Institute for Medical Research. Flexner, a man of wide academic experience and thin academic accomplishment, proceeded with tunnel vision. A few minutes with the academic register Minerva would have revealed a wide range of Western European models, among them the Collège de France in Paris, the Royal Institution in London, the Kaiser-Wilhelm Gesellschaft in Berlin, the Residencia de Estudiantes in Madrid, along with the Solvay institutes in Brussels and the Nobel Institution in Stockholm. Intellectuals, notably Paul Otlet, were planning for a “World City” of academic and scientific activity. In the United States, there was, most obviously, the Carnegie Institution of Washington, with groups ranging from astrophysics and genetics to history and archaeology. Although Flexner later borrowed eclectically, none of these institutions or initiatives figured in his initial plans.

Louis Bamberger imagined, initially, a location in Newark, the place of his home and fortune, and his thoughts first turned to medical education. When Princeton became the site for the institute, Flexner, as the inaugural director, set out to catch the best minds in the world for the ivory tower experiment. The degree-granting side of the experiment quickly fell away. In the exact sciences, where the reputation of the institute was and remains, the selection of staff became relatively easy. Physics and mathematics, by 1930, had been transformed, and there was, Leopold Infeld emphasizes in Quest, a consensus about which stars shone brightest. Pursuit of Genius details negotiations—many of them successful—with Albert Einstein, Hermann Weyl, Wolfgang Pauli, Niels Bohr, Paul Dirac, Richard Feynman, Emil Artin, Kurt Gödel, and John von Neumann, among others. The book shows how Flexner worked to calm the gaggle of the governing board and smooth the feathers of peacock

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professors. Collaborating with Oswald Veblen, he strove to make peace with the Mathematics Department of Princeton University, a competing reservoir of testy and truculent talent (Flexner recruited Veblen from the Mathematics Department, and the two groups of mathematicians shared quarters in Fine Hall on the university campus until 1939). As Nathan Reingold and Ida H. Reingold observed nearly a generation ago in their volume, *Science in America: A Documentary History, 1900–1939*, mathematics in America was a balancing act: Success required drawing on immigrant talent without neglecting native-born and locally-educated minds. Abraham Flexner, an intellectual Jewish confidant of the big bourgeoisie who had married into the literary and Protestant establishment, maintained the balance. (His wife, Anne Crawford Flexner, was a successful dramatist, among whose credits is *Mrs. Wiggs of the Cabbage Patch*.)

Through the first two-thirds of the twentieth century, research in mathematics required little more than a sharp pencil. How much less expensive it is to fund a group of brilliant mathematicians than to support a herd of dairy cattle, run a model high school, or operate a cyclotron. The swamps and cornfields of America could certainly have ascended to something like the mathematical assembly at the Institute for Advanced Study. But no plantation heir, cattle baron, or mining magnate thought to endow an institute for advanced study in the hinterland. Princeton, a bedroom community for the rich and famous, was a natural choice for it. Once Princeton University received the Isaac Wyman bequest in 1910, the same year that Woodrow Wilson left the university’s presidency to govern the state of New Jersey, graduate studies rose to world prominence. Classicist Andrew Fleming West, the dean who courted Wyman and benefited from his largess, “was fabled to have run down the road to Trenton to get a copy of the confirming telegram” of the benefactor’s death (as reported in Alvin Kernan’s memoir, *In Plato’s Cave*). And prominent among purveyors of graduate studies at Princeton were the best mathematicians money could buy—they constituted, in Leopold Infeld’s view, “a very good department of a rich, distinguished university”.

Abraham Flexner, who began as a school teacher, was a generalist. In 1910 he had authored a survey for the Carnegie Foundation for the Advancement of Teaching about American medical education, much of which was bad or bogus; when he joined Rockefeller’s General Education Board in 1913, he expanded on the report to bring about an elite stratification in health-care training. (Abraham’s brother Simon was, beginning in 1902, director of the Rockefeller Institute in New York.) Abraham Flexner’s vision for the Princeton institute ranged across the academic spectrum. As a complement to the exact sciences, he set up a school of economics and also signed on classicists and archaeologists. Here his vision grew clouded and his consultants lacked insight. He hired Erwin Panofsky, but it is fair to say that many of his humanist geese (distinguished in the manner of thousands of humanists) failed to lay a golden egg, even though later appointments were held by Ernst Kantorowicz, Alexandre Koyré, Thomas Kuhn, and Otto Neugebauer. To my eye, Flexner’s significant investment in archaeology lacked a persuasive outcome, and his initiative in economics, apparently wedded to sustaining the capitalist avarice that lay at the core of the institute’s endowment, until recently led nowhere. Following the demise of the early economics group and the reorganization of the institute under Director J. Robert Oppenheimer beginning in 1947, the social sciences have had a relatively low profile, when not rocked by controversy. One such controversy, in 1972, involved an attempt to bring in sociologist Robert Bellah, an authority on “civil religion” in America, whose nomination brought a howl of protest from mathematician André Weil. The biological and medical sciences never enjoyed a major role at the institute, no doubt in part because of Princeton’s absent medical school and relatively undeveloped natural history collections.

At least in the exact sciences, a sinecure at the institute is a reward for spectacular accomplishment. The hope is that lightning will strike again. Incumbents were certainly not one-trick ponies, but it is not unkind to observe that, in the early decades, all did not repeat the brilliant innovation that brought each of them to Princeton. Leopold Infeld, who worked at the institute with Einstein for two years late in the 1930s, suggests why:

Is it not the very impact of the external events, the fact that one is in the middle of an active world, that one takes part in the great play of impinging forces which keeps the imagination active, thought vivid and prevents sterility?... Isolation, comfort and security as a reward for work done in the past may destroy the circumstances in which and through which this work was done. Scientific achievement is, as Einstein so often remarked to me, a matter of
character, and character is formed and developed by the hard struggles of life. Isolation, security, ivory towers, all may prove just as dangerous, or even more so, than too much hardship and bitter fights which destroy the conditions of work. (Quest, page 250)

Pursuit of Genius cites Richard Feynman’s earthlier assessment of the situation in the 1940s:

I could see what happened to those great minds at the Institute for Advanced Study, who had been specially selected for their tremendous brains and were now given this opportunity to sit in this lovely house by the woods there, with no classes to teach, with no obligations whatsoever. These poor bastards could now sit and think clearly all by themselves, OK? So they don’t get an idea for a while: They have every opportunity to do something, and they’re not getting any ideas...Nothing happens because there’s not enough real activity and challenge: You’re not in contact with the experimental guys. You don’t have to think how to answer questions from the students. Nothing! (page 263).

As Harold Allen Mooz-Kolov reports in his 1976 doctoral dissertation at the University of Michigan, The Organization of Scientific Elites, it is a sentiment shared by Abraham Flexner at the end of his life. Whether or not they were geniuses, whether or not they were people of sterling character, the institute professors cultivated an image of sagacity, and they used their time to reflect on a wide variety of matters. The best of them became something greater. The cloister of acclaimed thinkers acted as a beacon for all intellectuals. Children in rural poverty and in urban tenements came to know that it was okay to think deeply. Oppenheimer’s essays, The Open Mind, stood on the bookcase in my parents’ farmouse.

From its beginning, the institute has been national news, and people have scrambled for an association with it. It is a quintessential American creation. Over more than seventy years, a postdoctoral appointment there has sped thousands of careers. The institute has been selective in the knowledge that it cultivates, but more than any other community in recent times, it incarnates the museum at Alexandria—or perhaps offers an intimation of Isaac Asimov’s Second Foundation on Trantor. Abraham Flexner can be forgiven if (as Pursuit of Genius contends) he stayed too long at the helm of his ship.

By focusing on the wrangling that lies at the heart of running any institution of higher learning, Pursuit of Genius underestimates the extent to which the times made the institute. Indeed, one can imagine a successful outcome with any one of a dozen educators at the helm. Reading between the lines, a reader senses that Flexner’s limitations, rather than his prescience, account for the institute’s unique features. He attached fundamental importance to the salary and the prestige of chairs, rather than to infrastructure; never having administered a university, he was unenthusiastic about developing a mechanism for granting degrees; his lengthy negotiations with complex personalities—pursuing genius—indirectly led to a focus on postdoctoral and visiting positions—cultivating genius.

Although, during his tenure as director, Oppenheimer was attracted to the philosophy of American pragmatism (as reported by Silvan S. Schweber in his collection, Einstein & Oppenheimer), the Institute for Advanced Study represents the preeminence of supremely useless knowledge in an environment that is generally seen as the archetype of practicality—America does pride itself on practicality, on following the maxims of Benjamin Franklin and the prejudices of Henry Ford. Notwithstanding Flexner’s desire to have economist tinkerers rub shoulders with scholarly thinkers, his staff and fellows focused on abstraction. He envisioned no chairs for engineers, public-health officers, or psychotherapists. The Institute for Advanced Study began as an ark at a time of war, oppression, and discouragement.

In early twentieth-century America, uselessness demarcated class. The nineteenth-century mantra for enforcing class distinctions—religiosity—dominated both private and secular institutions of higher learning. Indeed, the Ethical Culture movement (the cradle of Oppenheimer’s philosophical understanding) was religion without dogma for the elite of America. By the early 1930s, places of religious devotion had ceded to great palaces for abstract learning—the New York Public Library, the American Museum of Natural History, the Metropolitan Museum of Art, the Cloisters, the Boston Museum of Fine Arts, the Philadelphia Museum of Art, Widener Library, the Field Museum—which focused volatile minds on lofty things and dignified the standing of the donors. The world’s largest research establishment, the Carnegie Institution of Washington, focused largely on impractical truths. Purity was also the focus of the Association of American Universities and the National Research Council, which met in halls from which the great majority of scholars and scientists were excluded.

A call for purity at high-minded private institutions fit with the anxieties of wealthy Americans eyeing waves of immigrants and their aggressive, practical enterprise. Nothing could be more pure, more at the center of liberal education, than languages and mathematics, according to Henry
Merritt Wriston, president of Brown University during its rise in mathematics under the graduate dean Roland George Dwight Richardson (who was secretary of the AMS from 1921 to 1940). Respect for purity and abstraction also animated Princeton's graduate dean Andrew Fleming West, who had an uncanny ability to fish shekels out of the pockets of plutocrats; it guided Henry Burchard Fine, simultaneously dean of the Princeton faculty, dean of the science departments, and chair of mathematics. (Like Brown’s Richardson, Princeton’s Fine—president of the AMS in 1911–12—was a proponent of “applied mathematics”, by which was meant not mathematics used by engineers but rather the mathematical elaboration of natural sciences, especially physics, in the sense of the Mathematical Institute at the University of Göttingen.)

This is not to say that nothing of immediate, practical significance came from Flexner’s collegium. Flexner’s successor Frank Aydelotte promoted an initiative in weather prediction, and John von Neumann, while at the institute, played a fundamental role in developing electronic computers, notably the principles of core memory. (A universal intellect, he, like Einstein, examined the parts of the world he found interesting, and he, like Einstein, put up with jealous detractors.) Maybe, too, the economists appointed by Flexner were implicated in human suffering, whether alleviating it or promoting it. The point is that the institute was conceived as a place where the spirit of genius could blow where it listeth. A call from Flexner and his successors has prevented distinguished thinkers from fawning before insensitive patrons, in the manner of Leonardo da Vinci and Niccolò Machiavelli when they boarded with Cesare Borgia.

It is widely held that the institute has declined over the past generation or so. Possibly so in the exact sciences, probably so in the human sciences. There is some comfort in observing that, even if they are not of society, institutions are in society. History exhibits fashions of the intellect. Postmodernity has heaped scorn on Robert K. Merton’s four institutional imperatives of science (universalism, communism, disinterestedness, organized skepticism). Today, immature minds are instructed that success is measured only in solipsism, in personal gratification; the message retained by many talented young people is to accumulate wealth rather than to seek truth. But as Henry Rosovsky notes in his memoir, *The University: An Owner’s Manual*, an institution outlives its staff. Notwithstanding perilous times ahead, profundity shall once more become fashionable, and the institute will likely play a role in that renascence. And if this were not enough, all in all, considering the alternatives, the Institute for Advanced Study is still *primus inter pares*.

Even taking into account the respect accorded pure science early in the twentieth century, the Institute for Advanced Study came into being only because, as *Pursuit of Genius* points out, Bamberger sold his store shortly before the stock market crash that signaled the start of the Great Depression. The times are different now, as we perch on the rim of a Second Great Depression. Today, as Paul Forman has persuasively argued in his publications, science is an epicycle on the great wheel of technology—on artifice—rather than being the luminous body around which technology whirls. In such neologisms as *tecnoscience* and *STEM fields*, technology has the place of pride. Technology commands the attention of the bureaucracy at the Arlington headquarters of the National Science Foundation. There is a massive campaign to force universities toward practical—that is to say, lucrative—enterprises. Woe to the university today without offices dedicated to intellectual property, technology transfer, and “auxiliary enterprises”.

Leading speakers for higher learning have ceased to defend the very thing they represent. They have forgotten that their institutions do not manufacture artifice so much as understand it. (Not for nothing, and notwithstanding postmodernist relativizers, is “artificial” considered the opposite of “natural.”) Understanding artifacts (and using them) belongs in the province of scientists; understanding how people interact with artifacts is the burden of humanists. The finest artisans and builders, the most imaginative musicians and writers, carry out their enterprise in the agora, not in the academy. Technology, that is to say artifice, will do well whether or not institutions of higher learning focus on it. Technology powered Rome, whose accomplishments in science and institutions devoted to science are imperceptible. People in Medieval Europe did not neglect innovative technology, even though there were no academic institutions promoting it. So, too, in large measure, is the story of the Industrial Revolution. In the present darkness and uncertainty, as universities turn into trade schools, we need, above all, to build on the model of the Institute for Advanced Study.