Homework

Homework. Problem Sets. Exercises. That's what I thought of as I wandered about the exhibit of of Jackson Pollock's notebooks at New York City's Metropolitan Museum of Art. I was taken aback. I suppose that I had anticipated pages and pages of dripped paint and squiggly lines, small-scale studies of the brilliant explosions of creativity for which Pollock is best known, but instead, what I saw here was homework, and lots of it. Imitations of El Greco, copies of magazine covers, formal exercises in shading and line and geometry – I was surrounded by pages and pages of practice.

In my initial surprise, and then delight, I had been guilty of exactly the same prejudice that I so often find myself fighting against as I teach or explain mathematics – that ability, and even genius, is a birthright, and not something that can be cultivated. This is certainly the picture of Pollock which I had always painted – as an artist who created his work as naturally as he did his life. His is a name that evokes images of energy, movement, even chaos. The large canvases that are a riot of dripped and splattered paint – an apparent explosion of motion frozen in time and space; the by now almost mythical story of his hardscrabble origins and hard-drinking life that ended with a convertible careening down a dirt road in Long Island, Pollock drunk at the wheel, crashing into a telephone pole. He was the embodiment of "action painting", and one of the great and original figures of Abstract Expressionism.

I think of the famous Hans Namuth photographs of Pollock at work on *Au-*

tumn Rhythm and *One, Number 30*, as well as Namuth's 1950 documentary film, which are some of the most famous and inspiring pieces of documentation of the creative process. In them we can watch Pollock as he creates his energized drip canvases. We see him moving like a dancer, tossing, teasing, twirling paint in an almost unconscious, yet considered way. I saw him as someone whose thoughts, emotions and unconscious simply transferred directly to the tip of his paintbrush – in short, as the born artist.

But here in the exhibit the myth is exploded. I saw the labor, the practice, the repetition, the same things that I try to stress to the student, friend or acquaintance who says with equal measures of sadness and exasperation, "I just can't do math!", as if it were primarily an issue of genetic predisposition. Usually, the math that people say they just "can't do" is calculation, and an initial frustration with this sort of introduction to mathematics can be enough to make someone give up for life! For sure, this is a part of mathematics, but in fact, a facility in this is not the final yardstick of mathematical ability. Mathematical aptitude can it reveal itself in other ways too, and sometimes, it's just a matter of giving someone an entree along some more personally familiar path, to show them that they can understand mathematics.

The road to Pollock's seemingly unconscious artistic expression was anything but a natural one. The overwhelming consensus is that Pollock had almost no innate formal talent. His early artistic life was, to put it mildly, a struggle. A struggle to overcome alcoholism and depression just to get through each day; a struggle to overcome a limited innate classical artistic

ability so that he could create something of aesthetic and personal value. The former battle was eventually lost, but in the latter he persevered, sustained initially by little more than a single-minded and tenacious desire to be an artist.

Pollock put in years and years of practice. He tried out all sorts of media, including sculpture and metalworking. Always it seems he returned to painting and drawing, even though, as his early work shows, it did not come easily. Copying, copying and more copying. Imitating the classics, trying to master the techniques of line and shading. Apprenticing to Thomas Hart Benton, the famous realist and geometric reductionist.

Of course, this is not to say that practice is all that there is to the creative process. What makes a great and truly creative work is the ability to turn all of this practice into something new and remarkable, and here there is a certain magic at work which for all of our progress in psychology and cognitive science still remains just that – magic. The genius of Pollock was to take his academic knowledge and turn it on its head, learning enough of formalism and geometry to consciously destroy it in his paintings as soon as he recognized it. This sort of dynamic surely fueled the development of the so-called "all-over" technique of his famous drip paintings. To truly re-imagine the future we must be able to recognize the past.

It is now widely agreed upon that a firsthand exposure to Jungian ideas of expression of the subconscious are what opened the door to these techniques. Pollock, like many of the Abstract Expressionists, was for some time an

advocate of automatism and automatic writing, the goal of which was to paint or draw "free of the dictates of conscious manipulation". Yet the unconscious must draw from somewhere. The images that arise do not spring up simply from our grey matter, but rather from some well of experience, emotion and even technique. As the pen, pencil or brush races across the canvas seemingly unguided by direct thought, the motion must draw from some familiar, natural, unblocked and deeply remembered activity: the practice.

Much of the same is true in mathematics. While for various reasons many of us like to believe in the myth of the born mathematician and mathematically gifted, in fact, for most of us, mathematical skill is to a degree an acquired talent. Pages and pages of sums, then multiplication tables, algebraic manipulations, geometric formulas, and depending on how far you go, integrals, matrix operations, and solving differential equations. Problem set after problem set, example after example, until finally one day, the mechanics of it all recede into the background and our minds, our creativity, our inspiration is both set free and given the tools to express itself. Now you can design that beautiful house, plane or graphics program; now you can explain that economy or disease response. Your heart will choose the music you want to hear, and mathematics will help you dance to it.

In many ways, the accompanying work, *Plate 37*, speaks directly to the struggle Pollock had with formalism as well as the benefits he was able to glean from its study. These are sketches that Pollock made during a famous 1936 visit to Dartmouth College, with his brother Sande, Bernie Steffen, Phil

Goldstein, and Reginald Wilson (all artists, to see the recently completed Orozco mural cycle, *Epic of American Civilization*. In particular, *Plate 37* seems mainly inspired by the panel *Gods of the Modern World*.

The panel consists of five ghoulish academics bearing witness to the midwifing of the "birth" of a skull from some skeletal cow-like figure, who lies supine, surrounded by specimen jars and books. Academic learning, art or science without inspiration, without magic, is a lifeless exercise. Pollock's drawings – the delicate lines of bones, skeletons and ghosts – belie the hours of academic drawing exercises, but of course are much more than that. The floating figures sketched here are a synthesis of his perspiration and inspiration. Skeletons that have been transformed into almost playful Miro'-like biomorphic figures. Life breathed into death. Exercises infused with energy.

So now the picture I paint of Pollock is a different one. I still see him dancing in the Long Island studio, but I see the dance differently. The sheer physicality of his creative process - creating work, by working hard, and the painting taking shape, recording the exertion and exuberance that is dance. He circles the cramped room made small by a canvas stretched practically to its boundaries, moving like a shaman in some ritual dance – ritual, the conscious repetition of an exercise whose goal is to summon forth the magic and mysticism of a creative force. Just as the shamans which held a peculiar fascination for Pollock, might dance to encourage life from a seed or restore an ailing Indian to health, Pollock dances as if to germinate the seeds of genius in the hull of the too-small farmhouse that made up his studio. I think of

this as I circle a problem or an idea, sometimes trying on a geometric point of view, at other times an algebraic one, always constrained by the demands of logic and proof that is mathematics. One of us an artist and the other a mathematician, but both looking for an opening that might turn all that homework into a thing of beauty.