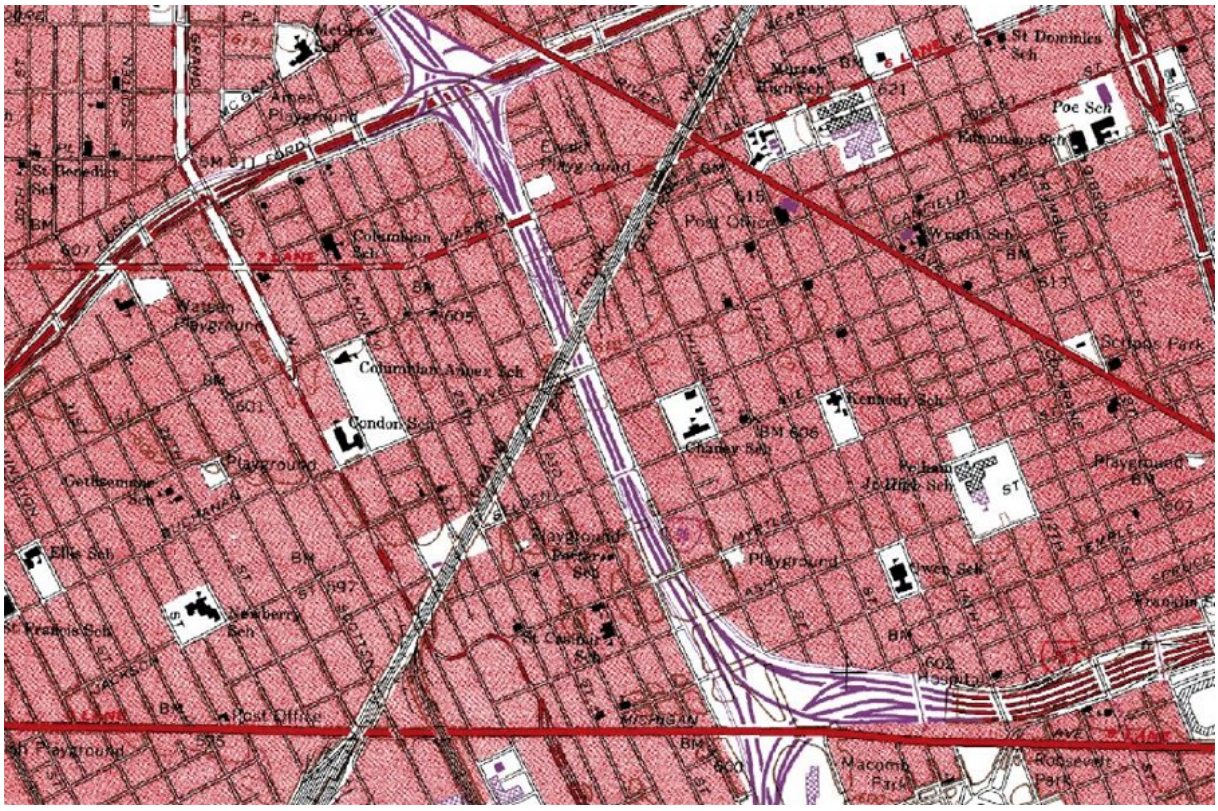
Realized Images

A Study of Maps and Perception

by Geoffrey George



~ Pink and Green Ink ~

My dad dragged his finger on the map northward along the Missinaibi River, stopping at a sharp turn marked Wilson Bend.

"The rapids here are really heavy, and there are three and four foot drops."

He continued dragging his finger and stopped suddenly at a town called Mattice. A red line, Highway 11, ran through the town and across the Missinaibi River.

"Mattice is a small town, probably no more than a hundred, maybe even fifty people or so. You can stop there and rest a day or two, or if you're injured they can take care of you. It's the halfway point of the trip."

My father had marked the map with his own notations in pink and green ink. The green marks indicated the distance between certain landmarks. The pink marks described the conditions of the river in a certain area. The map itself, published by the Surveys and Mapping Department of Canada, was even more meticulous. An inch represented four miles. Elevation lines wrapped the contours of the Missinaibi. Green and brown shading blotted the map, indicating forest or dry plains. Every straight, red road cut across the landscape with disregard for natural features. Towns lined the highways, their dense centers outlined and filled in with black.

Suddenly, my father stopped concentrating on the map and looked at me through his reading glasses, smiling.

"I never actually took this trip," he said.

I was surprised. Everything was on the map. He knew the condition of the rapids at certain areas of the river, and he knew the distance between campsites and rest areas. He knew Mattice. I did not understand.

"It's something I used to do. I planned this trip but I never got around to actually taking it. Not in real life, at least." He leaned back in his chair. "In a way, you can experience the whole trip sitting in your living room, so long as you have a map in front of you."

I knew what he said was true. When I went to Italy a few years earlier I would take out my pocket map of Detroit to revisit home the same way my dad canoed down the Missinaibi River without ever leaving his study.

My father and I were born and raised in a strange land. Michigan is shaped like a hand, and we only know that because it is drawn that way on maps. For my father and I, this land exists largely because of the way mapmakers chose, and still choose, to interpret their surroundings.

Is it possible, then, that a mental map of our environment exists in our minds? And are physical maps projections of the landscapes that they represent, or are they projections of the mental images of the mapmaker? Is there some other reason why my father and I, inhabitants of land mapped extensively only in the last two hundred years, are particularly fascinated with the *projections* of this expansive country?

~ The Childhood of Cartography ~

The discovery and mapping of America allowed explorers and cartographers to practice their craft on a newly-discovered continent. With a limited knowledge of the geography of the New World, America's first mapmakers made many errors. They were sometimes the result of a poor communications or the acceptance of conjecture as fact, but often a single cartographer would simply misinterpret the landscape due to the lack of

an all-encompassing bird's-eye view. The errors would perpetuate until someone eventually noticed a discrepancy.

Errors were not just geographical. In fact, a single mapmaker's blunder established the name of the world's superpower. Both American continents were named after Amerigo Vespucci, the 16th-century Spanish explorer, but he really only came in contact with what is now South America. Although Christopher Columbus (and the Vikings before him) reached the New World long before Vespucci, the German cartographer who first wrote "America" (the Latin form of Amerigo) on the indistinct landmass in 1507, chose to ignore this. Columbus died in 1506 and was unable to protest the decision. Now the mistake is irreversible, and the name "America" is immediately recognizable to almost everyone in the world—and these same people know nothing of Vespucci himself or of the infamous misnomer.

The errors continued. After the discovery of the west coast of America, many cartographers thought a forty mile-wide strait called the Vermillion Sea ran between the Island of California and the American mainland. Cartographers later discovered that mapmakers had obtained their information from local natives, who said a great "sea"—actually Death Valley—existed beyond the mountains. Cartographers of the distant future may have to keep the name of that nonexistent sea in mind when California really does fall into the ocean. Many unexplained anomalies exist on the maps of early North America: a huge sea in the middle of the Pacific Northwest, two gargantuan islands in Lake Superior, and a strange, twisting passageway to China through the Chesapeake Bay.

Despite their errors, early maps represented the landscape of the explorer as he interpreted it. The inaccuracies were never misleading for the cartographer. For the

mapmaker, the misshapen coastlines really were twisting and crooked, and the phantom islands really did exist. Early cartographers translated their mental perceptions of the surrounding environment to the page. Cartographers with an eccentric perception of reality probably drew the more inaccurate (and, ultimately, the more interesting) maps. Cartography was in its hesitant, curious childhood, and techniques and methods would not be perfected for many years. Until then, early cartographers each possessed a unique style that was incorporated into their projections.

So it is understandable that as a child I made maps of the new lands I discovered. Most of the cartographic evidence of the New World of West Bloomfield existed in my head, but I often documented my findings in the form of green marker and brown colored-pencil drawings that I kept in stacks in the desk drawer in my room. Like the early cartographers, I carefully and specifically labeled every map: "LAKE FROM SCHOOL BY DANNY'S," "CANAL IN BACK YARD AND TREES BY THE OLD DOCK," and so on. They had a simple key and identified certain landmarks with names I invented. Thankfully, I did not have any rival explorers (those who joined me on my explorations knew little of my cartographic habit) so there was no debate when I named certain areas myself. There was not a 10-year old Vespucci telling me that the swampy canal behind my house could not possibly be called "The Detroit River." (Actually, the canal empties into a lake that feeds a creek that forms a tributary of the River Rouge, which feeds into the Detroit River—which is exactly where my grandfather once worked at Henry Ford's Rouge Assembly Plant, which produced the cars that drove the white flight out of Detroit and into my distant lakeside suburb—so there is *some* connection.)

Although I did not realize it at the time, my maps acted as a documentation of my youth. Certain insignia symbolized noteworthy events or places. Near the vine growth four houses north of mine, a star indicated a secret hideout that my neighbor David and I had constructed. A red X just behind my elementary school did not symbolize "buried treasure;" rather it was the spot where my friend Danny and I found a dead Canada Goose sprawled on the school lawn, its wings outstretched as if it fell from the sky in mid-flight. Tomorrow the schoolyard would be full of kids on after-lunch recess, but we discovered it first and decided to move the carcass to a safe spot where we could show our friends. There was a growth of low bushes and pine trees near Father Murphy's house adjacent to the school, and if the goose were placed under them neither the schoolteachers nor Father Murphy would see it. But first we had to get it *across* Father Murphy's immaculately manicured lawn.

We dragged it with some difficulty by its twisted, black neck about ten paces. Almost immediately it became apparent that the sudden movement had disturbed something vile deep inside the goose. We dragged it a bit closer to the bushes when suddenly the rotting belly burst open and white worms spilled all over the grass. Danny and I took two awkward steps back and covered our noses and mouths. It was unspoken between us but we knew that Father Murphy, the tall, bald-headed, coldly-serious man we feared more than death, would catch us somehow. We were close to the house, and we could see inside through a large floor-to-ceiling window. Father Murphy's living room was unlit, and on a table sat a tall statue of Joseph, his arms outstretched toward us. In our panic we could only run, sick to our stomachs from the sight and smell and the thought that Father Murphy could have seen us the whole time. The map's red X

represented so much more than a dead goose: fear of authority, unease with Catholicism, a childhood friendship. I could go on.

I remember the blue dot hesitantly placed on the map labeled "CASS LAKE AND THE MYSTERY SPOT." Danny and I regularly explored the shoreline of Cass Lake behind the houses in his neighborhood, and one of the more densely-explored areas was a small bay that acted as a harbor for upper-middle class suburbanites to store their seldom-used pontoon boats. It was dusk when we discovered the Mystery Spot, that kind of dense, electric-blue Michigan dusk so common in the summer. The ground was wet from an earlier rain and the air stank of grass and the neighboring swamp. There was a small beach at the outlet of the bay and Danny and I headed that way, rounding a large pine tree. Then we saw them. Two teenage lovers having sex on the filthy lakeshore beach. The girl was on her back with her shirt off and the boy had his pants down just below his ass, thrusting awkwardly between her legs. Small waves lapped inches from the girl's unsandaled feet.

"Oh, shit, Anthony!" The girl spotted us. Anthony immediately scrambled to get his pants up over his pale backside as the girl reached for her shirt. Danny and I just looked at each other for a moment. It was the first time we saw "it" in person. This was an historic moment. It had to be immortalized. Unfortunately, Anthony did not share our reasoning.

"Get the fuck outta here!" he screamed. We ran. When I got home, I made sure to mark the awkward occasion by drafting a new map of the bay. The blue dot. It was an enduring memory transferred onto a piece of construction paper.

My maps commemorated my childhood. The neighborhood I lived in was not much of a neighborhood at all. It was a hastily-planned suburb, placed between a former two-lane county road and a low marshland. By the time I was a child, the road was inundated with suburb traffic. Cars went far too fast for children to play street hockey or ride bikes along the shoulder. A few years after I was born, a drunk driver killed my next-door neighbor's wife. (The neighbor never stopped mourning her death, and he lived alone and tended his unusual garden. He was an artist and he drew maps of his garden during the winter planning stages, placing the snap-dragons here, the pitcher plants there, and the garden grew in his mind while he waited for summer.) I do not remember her death, but it was enough reason for my parents, understandably, to prohibit me from crossing the street alone, at least not until I became "responsible." As a result, my contact with neighborhood playmates was, in some ways, limited. Drafting my own maps was one way to savor the experiences that those living in what I considered "real" neighborhoods experienced all the time. Incidents like seeing Anthony and some girl go at it, or dragging a dead goose onto a priest's lawn, were rare events. The forts, hideouts, bike paths, and backyards of the other neighborhood kids' childhoods were uncommon to me, so maps were a way of documenting the fact that I *did*, at least sometimes, experience those things. But long-term experiences never made their way onto the maps. Danny and I slowly drifted apart, and not in the kindest way. No map could ever indicate why.

My childhood maps contained many errors. Houses were placed incorrectly, the roads headed in the wrong direction, the lakes were misshapen and too small. But all of those inaccuracies really existed in my world, in the way I interpreted my environment.

The childish scribbled forest and the impossibly huge marshland represented what I actually saw. Perception was more important than accuracy. It was the same for early cartographers. The Vermillion Sea actually did exist during the childhood of cartography.

All of my maps are gone now, long since thrown away amid the hundreds of other childhood drawings, but they never stop existing in my mind. To this day, whenever I drive around the area where I grew up, I cannot help but picture the landscape projected onto construction paper in thin, green markings, as precise as a child could make them, spotted here and there with red X's and blue dots.

During those same years, my father's moderately-sized map collection became a source of fascination for me. It started with the huge atlas that sat on the top shelf of the bookcase in the basement. This massive book contained some of the most beautiful maps of the world I had seen. Densely detailed and brilliantly colored, they were perfect projections of the landscapes they represented. For some reason, I was particularly interested in the maps of Russia, which was still the U.S.S.R. when the atlas was printed. I was astonished that such a huge body of land existed. I was only familiar with the two-odd square miles around my house; our vacation spots in northern Michigan; and the Yucatan shoreline, littered with derelict fishing boats, from a brief and hardly remembered trip to Cancun when I was five. This infinite expanse of Soviet land seemed impossible. I had no idea there was *so much*, and I felt lost in a world overbearingly huge.

What made the atlas special were the maps of large cities on the last twenty pages: Hong Kong, London, Toronto, Paris, Sydney, Berlin. The city layouts were

hypnotic to observe. For hours I would let my eye follow the winding, circular, crooked roads of Paris and Rome and the square, rigid grid of Los Angeles. On the second-to-last page, there was a map of the Detroit area. The lake I lived on was a small blue spot in the upper left corner of the page. That small blue spot made me feel important. In an atlas of the entire world, amid the dense cities like Tokyo and the cold emptiness of the Siberian tundra, my house was there, too. Suddenly, I wasn't lost. For the first time I realized why people made and needed maps. They proved your existence, distinguished you from the six billion other humans, and confirmed your precise location within the 93 million square miles of land on Earth. See this blue spot? I live here.

~ The Scale of Things, and an Example of the Process ~

On State Street in downtown Albany, New York, I close my eyes and try to comprehend what I call "the scale of things." This is something I often do in airplanes while observing the land below, or on America's Main Streets where the close buildings embrace like American mothers, or on Alligator Hill overlooking Lake Michigan in Leelanau County. It is difficult to truly comprehend something like the distance we walk every day, the physical size of the built environment, or the immensity of a state or country. Measurements and numbers do not work well for me. They never have. As a boy I memorized the exact height in feet of the tallest buildings in the world. But they were just numbers, and nothing really made sense to me until I saw the Sears Tower for the first time from street level and then rode the fastest elevator in the Midwest to the observation deck and saw Chicago 1,454 feet under my feet. I need to see things to really believe them.

When I do understand “the scale of things,” I look at the world quite differently. On the way back from Italy, my plane flew over Greenland as the sun was rising. Greenland is often blanketed in a shroud of thick fog, but that day the air was icy clear. I looked down 33,000 feet at a desert of packed snow, glowing orange and glossy from the approaching sun. It took me a moment to comprehend what I was seeing, but the snow was so thick that it buried the mountains and the peaks breached the surface in a few spots. These buried mountains occasionally pockmarked the otherwise flat landscape like volcanic islands in the ocean. I really began to comprehend the scale of the Earth when I saw mountains buried in an ocean of snow and ice the thickness of ten Sears Towers stacked on top of each other.

So, standing on State Street at dusk my eyes are closed tight, and the crash of Albany surrounds me. I realize the scale one exponent at a time, zooming out slowly from the sidewalk: first, the sides of the buildings, the bricks dark from car exhaust, sweep past; the drunks and students on their way to who-knows-where walk underneath me; the fans, generators, and wires that make everything go crown the roofs; then the streets fill my vision, each one a separate artery pushing and pulling people on their way in cars and (less often) on foot; I see the great grid of the city, an expansive custom-made stamp on the land, with Central and Western Avenue diagonally slashing through the square grid; and I hear the cars scraping the pavement and the occasional excited yell; zoom out again and Empire Plaza creeps into view (in fact, I can’t miss it, so huge that it dwarfs the rest of the city); the brilliantly illuminated government skyscrapers stand guard in a neat row in front of the capitol building like white soldiers; the calm of the reflective pool mirrors the orange light-polluted clouds, giving the impression of an

empty void in the city center; then I see the massive freeway interchange, nearly as big as all of downtown, a great American monument to the motor vehicle, its roadways twisting and curling on one another and somehow sending things properly on their ways; now the sound of the city is an ethereal hiss; the lights of Troy and other distant post-industrial cities along the Hudson River fade into view; and I know there are lives walking every street grid and in every dimly-lit home and among the furrowed New York hills and behind every headlight on I-787. Then I add an exponent, multiply it again, zoom out farther, and I think of all the cities in New York State, and then the country, and so on, until the world is drenched with so much humanity that I just can not comprehend it anymore.

I open my eyes and I am back on State Street, and someone is asking me for change.

~ The Modern Age of Mapmaking, and Maps as Art ~

Despite the fact that many areas of the United States have been mapped and remapped, cartographers of the modern age of mapmaking, which began in the 1900s as people gained a familiarity with the American landscape, did not have it any easier than their pioneering predecessors. Perfection became a necessity. Whereas the early explorers could make errors without tarnishing their reputations, modern cartographers had to be exact, and even the slightest discrepancy was noted. Improvements in surveying technology helped overcome many of these difficulties.

Apart from identifying location, maps soon displayed cultural and social information. Election results, corn production, energy use, and literacy could be shown

on a map of any area of the United States simply by converting data information into a graph. Cartography also took advantage of improvements in space technology. During the Cold War, the United States began taking satellite photographs of Russia and Europe. The bird's-eye-view photographs simply had to be traced, and a new, perfectly accurate map was available. Soon, satellite imagery of the United States was being used in agriculture, forestry, and planning.

Many maps, both ancient and contemporary, possess significant artistic qualities. Contributing factors include color choice, line width, and selection of content. Early hand-drawn maps included extraneous etchings or other beautiful drawings of the area represented on the map, often in the form of an elaborate cartouche. A map of Charleston, South Carolina, for instance, may have a hand-drawn panoramic view of the city on an unused area of the page near the key. Maps of imagined locations are popular in artistic circles. Cartographers of these imaginary maps have the freedom to create any landscape, and they will regularly incorporate unnatural shapes or landforms. Arguably, every map is a work of art, each with its own distinct artistic characteristics. The fine detail on the 1958 Texaco Cruising Chart of the Great Lakes, with its bright blues and reds, provides a stark contrast to the 1967 Low-Altitude Flying Chart of the Great Lakes, with its sterile grays, cloudy land features, and huge directional charts superimposed over each major city. They're beautiful in their own way, but at the time no one thought twice about their artistic qualities. These old maps served a specific purpose. They were soon forgotten about, and now they are only useful as works of art. As a map ages, artistry replaces functionality.

It is now safe to say that most of the Earth has been accurately mapped. Cartography has lost the sense of adventure that once came with it. The excitement of exploration is long gone; there are no new lands to be discovered. Cartographers, therefore, belong on the new frontier, mapping the planets of the solar system. A Cartographic Space Race will soon begin; new errors will need to be corrected, new borders will need to be established, and new continents will need to be inappropriately named.

I can imagine these space cartographers now, as placid and boring as Dave Bowman of *2001: A Space Odyssey*. They will act as mediators between machine and nature, dumbly translating data and computer-generated projections. But in theory they will not be too much different than the early cartographers. Still, men will only know the physical environment as a projection, existing somewhere in reality but definitely existing on a piece of paper, with the contours measured and mapped and decorated with colors and numbers and words.

Where will the imagination go? Early cartographers were as much a part of the map as the land itself. Will personal style and grace be lost in computer equations? In a way, anything that is a result of human development is imaginative in some way. There exists a human artistry in the archaic numbers and sequences of a computer, too. Computer printouts will one day have the same artistic merit as ancient hieroglyphs, or Japanese scrolls, simply for their symmetrical typographic beauty. These forms of text represent the human brain a certain point in history: the ancient brain manifested itself in the form of pictorial hieroglyphs, while the modern brain of the computer age manifests itself in billions of word-processed pages and stock market printouts.

Maps, too, will change in the same way. Already they are mass-produced, solidly colored, and almost never inaccurate. But there is a human artistry and creativity behind the automatic craft, however hidden to us, that will only become apparent when ancient disk drives are re-discovered, and the futuristic archaeologist will see the clean, thorough maps and call them works of art.

~ *Regarding Henry Walling's* Atlas ~

Henry Francis Walling, a 19th-century cartographer who undertook the massive task of mapping Michigan's counties before they were even properly established, published an atlas of his life's work in 1873 called *The Atlas of the State of Michigan*. The book is massive—it measures 14 by 18 inches—and it contains hand-painted maps of the Union's most diverse state. A lengthy preface introduces the *Atlas*, and in the Salutatory, Walling kindly greets the reader "with congratulations, which we feel should be mutual, on the completion of our arduous labors, editing, compiling, drawing, engraving, and publishing the work now placed before you." After reading that, I couldn't shake the strange feeling that Walling had never wanted to disconnect himself from his life's work. In a section titled "The Value of Maps," Walling, rather eerily, seems to put into words what I have been thinking about maps for years. He writes, "Maps of States, complete in comprehensive entirety as well as in plentitude of minute detail, such as we here present to you of Michigan, possess an intrinsic and practical value far beyond that due to the mere pleasure they afford in regarding them as pictorial representations of the territory represented as it might appear, could it be looked down upon from a great elevation."

Walling's maps allow the viewer to form a mental image of map's subject. In a section titled "Imagining Point of View," Walling writes, "Supposing the atlas page to be viewed at a distance of fifteen inches from the eye, then, since the scale of the map is three miles to an inch, fifteen inches above the maps corresponds to forty-five miles above the ground." The maps in Walling's atlas are truly his own—projections of both his astonishingly accurate mental map of Michigan and of the actual landscape. The viewer could, with a sufficiently lively imagination, transport himself into a blimp forty-five miles above the Earth to view the landscape below, simply by looking at Walling's renderings. Because of this, Walling's maps instill in the viewer a clear sense of scale and relation to the physical environment. Walling was undoubtedly able to sense "the scale of things" on its most complex level.

The maps themselves are carefully detailed and contain ample information without being excessive. They are printed from engravings, and color has been added to each by hand, most likely by one of Walling's assistants. A rather elaborate map of Michigan's soil conditions must have taken the most time to paint: it employs seven different colors, all carefully placed on the corresponding region of the state. The map of Oakland County, the county in which I was raised, contains few roads and appears sparsely populated. The roads have the same names as now, but they have long since been widened and re-routed to accommodate the influx of Motor City traffic. Homes are now squeezed along the shorelines of the county's many lakes, but on Walling's map there are few structures. On the eastern shoreline of Orchard Lake there is a triangular parcel of land painted red and identified as the Michigan Military Academy, which later will become St. Mary's Preparatory, my high school. Just a few centimeters to the right,

on the northern shore of Upper Long Lake, is where my home will be in 120-odd years. "I *will* live here."

So here I am in 1873, in a blimp forty-five miles above Oakland County, looking down on the lakes I have been swimming in since childhood and at the future site of my home and high school. Henry Walling is with me, writing "Michigan Military Academy" on the ground in huge, cursive letters. I turn to him.

"Was this a difficult map to make?" I ask.

"Oh, heavens no. We had the Farmer surveys from '58 to use for reference. And the county's proximity to Detroit means it was more populated and explored than most others. We ran into some difficulty with all the lakes, though. You have to make sure they're aligned properly."

I look down for a moment more to enjoy the scenery. From this height you can see the curvature of the Earth and the blue haze of the atmosphere. Walling slaps me on the back and I look at him.

"Only the more thoughtful truly recognize how closely and extensively the prosperity of an entire country depends upon the existence of *accurate maps*." He is quoting his own preface to the *Atlas*.

I look back at the Earth and repeat his words. "The prosperity of an entire country."

~ Mental Maps ~

Maps often look drastically different than the land they represent. Surely the world is not covered with place names and red lines and splotches of color that only

distantly rhyme with the shape and appearance of the actual landscape. But for some reason we trust the map. We trust that the lines are roads and that the dots are towns full of people. The image of the map leaves an indelible mark, and we form a representation of the landscape in our mind. These images may not look like AAA highway maps, but our mental maps guide us through this world. Like a boy pointing out his city in his father's atlas and saying, "I live here," we are constantly identifying our location on our mental maps. Reality is linked with a mental projection of reality—our mental maps. That is not to say that mental maps are accurate. On the contrary, they may bear no resemblance at all to an actual map of the corresponding area. However, the mental maps exist, and we, in turn, exist somewhere on that map. "I live here."

There are reasons why Walling's maps evoke images of hovering blimps and why my father's atlas cemented my psychological existence. There are reasons why I drew hundreds of maps as a child, and why my father canoed down the Missainabi River without ever leaving home. There are reasons why "the prosperity of an entire country" relies on maps.

Perhaps it is because we live in a nation that relied on maps to guide us blindly out of the race- and industry-torn rust belt cities and into the comfort of suburbia, and now occasionally relies on maps to guide us back into the city for a baseball game or a theater show. A country's physical boundaries represent a time long gone when power was expressed by the amount of land a country had control over. Now, power is expressed by the amount of influence in the political theater, where boundaries are nearly limitless, and the mapping of physical locations only continues because maps secure our

psychological existence as a country and as a people in a world of nameless and unseen billions.

But there is something beyond these petty complaints. I cannot forget my father's hand marking topographical maps with pink and green ink. Maps, mental and physical, guide us. The pink and green marks we draw on our world are for all to follow, for all to love, for all to avoid, and for all to forget.

Endnotes

page 1. The map discussed here is the *Map of Kapuskasing Ontario and the surrounding regions*, produced in 1966 and printed in 1968 by the Surveys and Mapping Branch, Department of Energy, Mines, and Resources, from field surveys 1956-60.

2. Mental maps: My meaning of the term "mental maps" is different than what is conventionally discussed in cartography essays, but the term itself has been borrowed nonetheless. Most notably, the writer Denis Cosgrove discusses "mental maps" strictly as projections of actual mental thoughts and processes. Denis Cosgrove, *Mappings* (London, 1999), p. 234.

2-3. The process of errors in mapmaking: Seymour I. Schwartz, *The Mismapping of America* (Rochester, 2003), p. xiv.

3. Amerigo Vespucci: Schwartz, pp.1-36

3. The Vermillion Sea: Schwartz, pp.127-155.

3. "A huge sea in the middle of the Pacific Northwest…": 1752 map of Philippe Bauche from Schwartz, p. 122.

3. "…two gargantuan islands in Lake Superior…": Although many maps of the mysterious islands exist, the 1744 map of the Great Lakes Region by Jacques-Nicolas Bellin probably illustrates them most clearly. Schwartz, p. 211.

3. "…passageway to China…": 1599 map of Edward Wright and Emeric Molyneux from Schwartz, p. 120.

4. Maps of my childhood: Although long since gone, I remember the maps I used to draw as a child quite well and when a map is directly referenced it actually did exist.

8. "…the huge atlas…": *Rand McNally Atlas of the World*. Chicago: Rand McNally and Company, 1988. My father marked the pages of this atlas, too, notifying the homes of family friends on the maps of Los Angeles, Seattle, and Detroit. After the fall of the Berlin Wall, my dad tried his best to signify the border between East and West Germany no longer existed by scribbling over it with black pen.

9. "93 million square miles": http://hypertextbook.com/facts/2001/DanielChen.shtm

9. 1,454 feet: Trust me, the Sears Tower really is this tall. I still remember.

11. "…modern age of mapmaking…": The modern age of mapmaking is not properly established, although the 1900s is conventionally the period during which maps were perfected; American maps from this period most similarly look like the accurate maps of today. See Cosgrove, 214.

11. "…Improvements in surveying technology helped overcome many of these difficulties …": Ristow, 188.

11. "…cultural and social information…": Cosgrove, 102.

12. Satellite photography: United States Department of the Interior. *Landsat: A Global Land-Observing Program*. Reston: United States Geological Survey, 2003.

12. Elaborate cartouches: For examples, see Ristow, 194-199.

12. Maps as art: A book by Katharine Harmon called *You Are Here* is the best assemblage of artistic maps I have seen, and it was my first real exposure to maps created solely for artistic purposes. Harmon also explores existing maps with artistic qualities.

12. 1958 Great Lakes Cruising Chart, 1967 Low-Altitude Flying Chart: These are a couple of my favorite maps from my father's map collection.

14. Henry Walling, etc.: Henry Francis Walling, *Atlas of the State of Michigan*. Detroit: 1873.

14. "with congratulations…placed before you.": Walling, i.

14. "Maps of States…great elevation.": Walling, i.

15. "Supposing the atlas…above the ground.": Walling, i.

15. Map of Oakland County: Walling, 160.

16. "Farmer surveys from '58": Yes, "Farmer" is real. John Farmer (1795-1859) was a noted Michigan cartographer that laid the groundwork for most of Walling's maps of Michigan. Ristow, 274.

16. "only the more thoughtful...accurate maps.": Walling, i.

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