

RAMSEY COUNTY  
**History**  
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**Spring 2006**

Volume 41, Number 1

*Stahlmann's Cellars:  
The Cave Under  
the Castle*

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*Lost Neighborhood*

Mary Hill's Lowertown, 1867–1891

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*Mary Mehegan Hill (1867). This painting is from a wedding photograph. The date of the painting and the artist are not known. In 1956 a member of the Hill family gave this painting to the James J. Hill Reference Library. Reproduced by permission of the James J. Hill Reference Library, St. Paul, Minnesota. Photograph by Maureen McGinn.*

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# RAMSEY COUNTY History

Volume 41, Number 1

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The Ramsey County Historical Society shall discover, collect,  
preserve and interpret the history of the county for the general public,  
recreate the historical context in which we live and work, and make  
available the historical resources of the county. The Society's major  
responsibility is its stewardship over this history.

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and by a contribution from the late Reuel D. Harmon

## A Message from the Editorial Board

Our Spring issue leads with dual articles presenting a vibrant portrait of old Lowertown, which now remains only as a fragment of a neighborhood tucked within a spaghetti-like web of freeway lanes. Eileen McCormack describes the social and economic framework that nourished Jim and Mary Hill from 1867 until 1891, when they moved to their Summit Avenue mansion. And David Riehle portrays the homes and businesses of working-class St. Paul citizens in the same neighborhood. Greg Brick leads a reader's tour underneath the streets in the West Seventh area, through thirty miles of corridors leading to caves that once cooled German-style lager beer brewed by the Stahlmann, and later Schmidt, breweries. Bernice Fisher provides an evocative remembrance of attending St. Adalbert's Catholic school in a Polish neighborhood full of traditions. Finally, many treasures await readers who sample our reviewers' picks marking, among others, Minnesota's state capitol building, the career of a recent riverboat legend, and the story of a gifted educator who grew up on a farm supplying butter and meat to city dwellers. We are proud of the last, *Pearl and the Howling Hound Farm*, which is one of our own recent publications, available through RCHS. Happy reading!

Anne Cowie, Chair, Editorial Board

# St. Paul Underground

## Stahlmann's Cellars: The Cave Under the Castle

Greg A. Brick

Between the mid-1840s and 1870, German immigrants to the United States brought with them their traditional fondness for beer, which had not previously been of great importance in this country, where harder liquors were usually preferred—something that has been called the “beer invasion.”<sup>1</sup> Ironically, this invasion was apparently facilitated not only by the burgeoning German population, but also by temperance agitation, which originally focused largely on “ardent spirits,” leading many Americans to choose the less potent beverage.<sup>2</sup>

Prior to 1840, there were no breweries in America producing the German-style lager beer.<sup>3</sup> Lager beer differed from the prevalent English and American beers, such as ale, in that the lager yeast fermented at the bottom of the vat, rather than the top, and the beer required lagering, or storage, for several months at lower temperatures. In the old days, lager beer could only be brewed during the winter months, when cellar temperatures were sufficiently low.<sup>4</sup> But in northern states, such as Minnesota, where natural ice was readily available, ice cakes could be harvested from nearby lakes and rivers in winter and stacked in caves, allowing brewing all year round to meet the growing demand.<sup>5</sup>

In 1848 Anthony Yoerg established Minnesota's first brewery, which produced lager beer, in St. Paul. Yoerg, like many St. Paul brewers to come, was a native of Bavaria, the cradle of the German brewing industry.<sup>6</sup> Several years later another important brewer, Christopher Stahlmann, arrived in the city.

### Stahlmann's Cave Brewery

Thomas Newson, in his *Pen Pictures* (1886), described Stahlmann thus: “He was born in Bavaria in 1829; came to the United States in 1846 and . . . removed to

ST. PAUL in 1855, and erected his brewery the same year. He was a member of the House of Representatives in 1871 and in 1883; was [Ramsey] County Commissioner in 1871, and held several other minor offices.” Describing Stahlmann's commercial enterprises in more detail, Newson wrote that “In early days he went out to what was known as the old Fort road, now [West] Seventh street, and purchased several acres of land there and built his brewery thereon. These acres were then considered away out of the city, but are now within the city limits and very valuable.”<sup>7</sup> Stahlmann was indeed “one of the greatest pioneers of the West End.”<sup>8</sup>

With the great growth of the beer market following the Civil War, Stahlmann's Cave Brewery, as it was known, became the largest brewery in Minnesota, with an

annual production of 10,000 barrels by the late 1870s. By 1884, his production peaked at 40,000 barrels per year, but by that time Stahlmann was no longer in first place.<sup>9</sup>

As the name “Cave Brewery” suggests,<sup>10</sup> Stahlmann carved an extensive lagering cave, still known as “Stahlmann's Cellars,” below the brewery. A newspaper reporter, in 1877, described the cave during its heyday:

Armed with candles, and conducted by Mr. Stahlman, the visiting party started down, down into the bowels of the earth; down through the strata of solid lime stone rock which underlies all that section, and of which the buildings are built, we went until we struck the underlying strata of sand rock, fully sixty feet below the surface. Here were the cellars—cellars to the front, the right, the left, and the rear—in all over 5,000 feet, or nearly a mile in length, and still the work of excavating new chambers is going on. These cellars are about 16 feet wide and ten feet in height. In them now are some 120 huge butts of different varieties of beer, in all over 3,000 barrels. The butts are in chambers, six or eight in a line, each group backed by a huge chamber of ice to keep them at proper temperature, in all over 6,000 cakes of the three foot Mississippi ice now being in store. Such complete cellars, dry, fresh and clean, we venture cannot be found elsewhere in America. . . . Fortunately Mr. Stahlman has an inexhaustible supply of the purest of spring water. It is brought in pipes from the bluffs, and carried into every floor of his private residence, feeds the boilers, runs through his cellars, all over the brewery and malt house, and is finally discharged into a sewer with the general refuse, which is discharged into the Mississippi through the cave.<sup>11</sup>

Several years later, in 1883, another account of Stahlmann's Cellars was provided by John Land, in his *Historical and*



Advertisement from Polk's City Directory for 1880/81.



From Frank Leslie's Popular Monthly, 1882.

*Descriptive Review of the Industries of St. Paul:*

It takes three-quarters of an hour constantly walking to traverse these subterranean caverns, or rooms. The works under ground cost \$50,000, and are more wonderful in their aptitude and construction than the building above the ground, and where the most of the work is done. It is a perfect labyrinth of rooms and cellars, and under cellars three deep, reminding one of the catacombs of Rome, for none unacquainted with these subterranean vaults, without a guide, could grope their way through them and find their way out to

daylight. We, with our guide, taper in hand, descended the first flight of stairs, and after meandering through their various ramifications, came out to the light of day one mile from where we descended.<sup>12</sup>

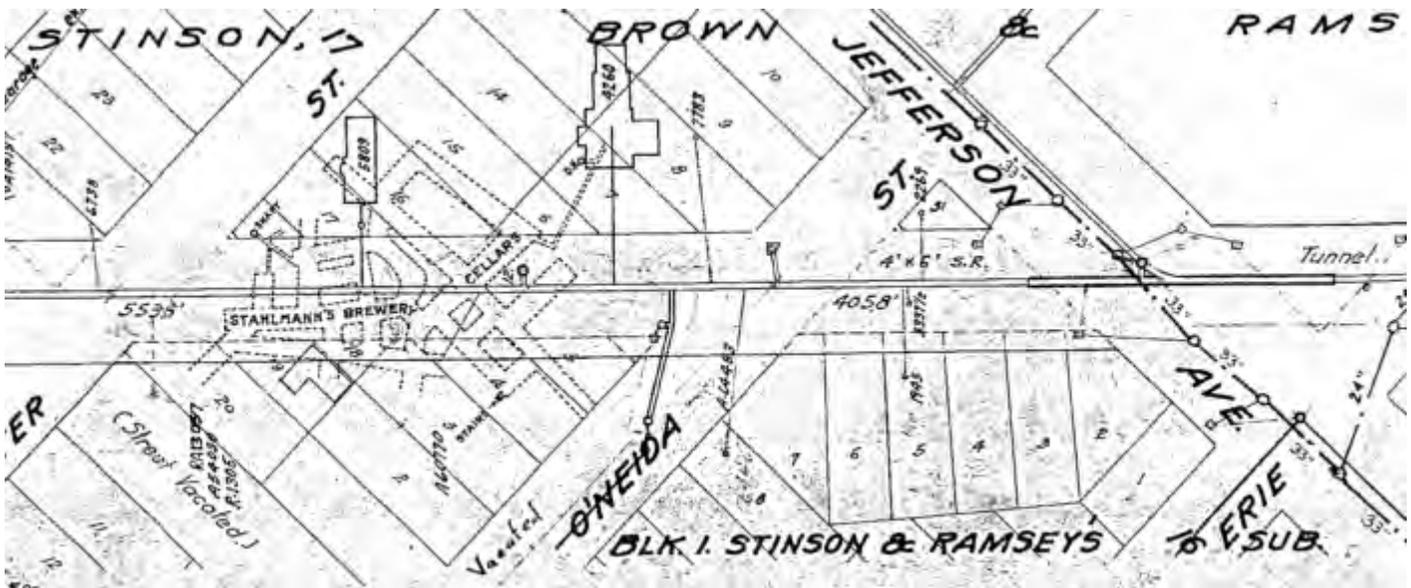
Atmospheric descriptions like these influenced later writers, until Stahlmann's Cellars acquired a national and almost mythical reputation as the very type of labyrinthine complexity, which it still held more than a century later.<sup>13</sup> As noted by art historian Susan Appel, "the breweries with the best and most extensive cellars became the most famous."<sup>14</sup>

Here are the facts: Stahlmann's Cellars were carved in the St. Peter Sandstone, with the bottom of the overlying Platteville Limestone left to form a flat ceiling. The cave is located from 20 to 30 feet below street level by actual measurement, rather than 60 feet.<sup>15</sup> And there's only one level, despite what Land's description might suggest. The passage dimensions given, "16 feet wide and ten feet in height," are about right. A partial map of the cave, dated 1884, was copied onto sewer plats, and it shows two grids of passages meshing at an angle. One grid, somewhat irregular, is aligned with Fort Road while the other, more rectilinear, is aligned with the real estate plat (Stinson, Brown, & Ramsey's Addition

to St. Paul), making 1,400 feet of passages.<sup>16</sup> Additional passages, under the present brewhouse, are shown on a different map, the "Sub Basement Plan,"<sup>17</sup> but these may date to another era. The total length of passages is more like one-half mile, rather than the mile claimed in the old accounts. Even so, the Stahlmann maze is more extensive than any other brewery cave in Minnesota.

However, the use of caves to trap cold winter air or to fill with ice, for lagering, was becoming obsolete by the 1870s, when brewers began to build icehouses, which "took the aging of lager beer out of caves and placed it in an aboveground stack of 'cellars' cooled by a massive body of ice at the top of the building." The construction of icehouses bypassed the arduous task of underground excavation. And with the widespread adoption of mechanical refrigeration in the 1880s, ice-making machines freed brewers from dependence on natural ice with its uncertainties of supply and price. The icehouse thus evolved into a mechanically refrigerated stock house, where temperatures could be even more scientifically controlled. Eventually, mechanical refrigeration focused on generating cold air itself rather than ice, avoiding altogether the bulkiness and messiness of ice.<sup>18</sup>

Examining the 1885 *Sanborn Insur-*



The 1884 map of Stahlmann's Brewery Cellars, from sewer plats. Nearby sewer tunnels are also shown. This map omits many cave passages, such as those under the present Schmidt brewhouse. Fort Road crosses the map from left to right. For orientation, Oneida Street runs north and south. The Stahlmann/Bremer mansion is depicted next to the word "BROWN."

ance *Atlas* for St. Paul, I found several icehouses depicted at the Cave Brewery, indicating that Stahlmann had converted to the newer refrigeration method by that year. These icehouses were built during the reconstruction of the Cave Brewery in the early 1880s.<sup>19</sup> The lagering caves were thereafter abandoned.

Another factor favoring the abandonment of lagering caves was the desire for cleaner facilities, following in the wake of Pasteur's research into the so-called "diseases" of beer.<sup>20</sup> The Fort Street Sewer (as it is referred to in the original contracts) was carved under Stahlmann's Cellars in 1884 and intersects it at several points. As seen today, this sanitary sewer has an impact on the cave, into which it sometimes overflows. It's therefore unlikely that the cave was used much after 1884, despite Land's account from the year before. Indeed, the Stahlmann Cave Brewery was incorporated as the Chris Stahlmann Brewing Company in 1884—without the cave moniker.<sup>21</sup>

A further consideration, unique to Stahlmann's Cellars, is that there has been extensive ceiling collapse, leaving a roller-coaster floor, so the cave isn't a good place to store anything. The collapse has been attributed partly to "vibrations from above"<sup>22</sup> and indeed, I observed that the passages completely truncated by collapse are the ones that extend under Fort Road, a major commercial artery.

## The Schmidt Brewery

Today, however, St. Paulites are more familiar with the Cave Brewery's successor, the great Schmidt Brewery, which towers over the Fort Road neighborhood like a magnificent, red-brick Rhenish castle. Jacob Schmidt was born in Bavaria in 1845 and learned his craft at Milwaukee's famous breweries and elsewhere, ending up at the North Star Brewery on St. Paul's Dayton's Bluff, which he effectively controlled by 1884. Meanwhile, Christopher Stahlmann had succumbed to "inflammation of the bowels" in 1883, leaving the Cave Brewery in the hands of his competent sons, all of whom tragically perished, however, one after another, from tuberculosis, causing the brewery to go bankrupt in 1897. In 1900, Schmidt, seeking to replace the North Star Brewery, which had

recently burned down, purchased Stahlmann's brewery.<sup>23</sup>

Schmidt rebuilt Stahlmann's brewery in 1901–02 along the Oneida Street axis, with the help of Chicago architect Bernard Barthel, who employed "the feudal castle style."<sup>24</sup> By this time, progressive brewers regarded the use of caves for lagering as a sign of backwardness. In 1901, for example, Schmidt's chief local competitor ran a newspaper advertisement boasting, "The only brewery in St. Paul that has a modern refrigerating plant is Hamm's Brewery. Beer is stored in rooms kept at a temperature of 35 degrees. Light, pure air and absolute cleanliness help to make the beer pure and wholesome. No dark, ill-ventilated caves; temperature unchangeable and ventilation perfect. Insist on getting the honestly brewed HAMM'S BEER. Annual capacity, 500,000 barrels."<sup>25</sup> Schmidt, whose North Star Brewery had depended on lagering caves at Dayton's Bluff, introduced mechanical refrigeration at the Stahlmann location. A 1901 article in a trade publication, reviewing Schmidt's new facility, reported that "the refrigerating machine . . . is furnished by the Fred W. Wolf Co., of Chicago."<sup>26</sup>

Jacob Schmidt died in 1910, but his able business partner, Adolf Bremer, together with the latter's brother, Otto, made the brewery one of the leading regional beer producers in the country.

With the onset of Prohibition in 1919, the Schmidt Brewery began producing soft drinks and a successful near-beer named "Select." When Prohibition was repealed in 1933, Schmidt resumed the production of beer and within three years claimed to be the seventh largest brewery in the United States.<sup>27</sup> After several changes in ownership, involving acquisition by Detroit-based Pfeiffer's in 1955 and LaCrosse-based Heilemann's in 1972, Schmidt ultimately became Landmark Brewery in 1991, operated by the Minnesota Brewing Company. The new owners considered giving tours of the underlying caves at the time,<sup>28</sup> but nothing became of the plan.

According to architectural historian Paul Clifford Larson, who conducted a study of the Schmidt Brewery, "The brewery industry was also a key player in the emergence of St. Paul from each of the major economic depressions between 1875 and 1930.... The vigorous activity of the brewing industry at the turn of the century occurred in spite of a growing temperance movement in the state. Newspaper articles celebrating St. Paul's emergence from the economic depression listed every leading industry but the one that had made the most investment."<sup>29</sup> Indeed, brewing, a major local employer, has been called "the West End's oldest and most dominant industry."<sup>30</sup>



*A fanciful moonlight view of the Schmidt Brewery from The Book of Minnesota, 1903.*

## Stahlmann's Cellars Today

I explored Stahlmann's Cellars with fellow cavers in November 1999. We traversed the extensive sanitary sewer labyrinth under the Fort Road neighborhood, which connects with the cave. Carved in the sandrock in the late nineteenth century, this labyrinth consists of thirty miles of narrow walking passages, and navigating the countless look-alike intersections could be tricky without a compass. The Fort Street Sewer, mentioned above, forms the backbone of this labyrinth.<sup>31</sup>

We entered the great sandrock labyrinth by walking up a stormwater outfall at Ross Island on the Mississippi River, and crawling through a small pipe into the sanitary side—something no longer possible owing to St. Paul's sewer separation program, which has sealed the connection. Once inside the labyrinth, we followed the Palace Avenue Sewer, the main drain for brewery wastes, to get to Stahlmann's Cellars.

Walking up this narrow sandrock passage for the first time, I heard a rush of water in the darkness ahead and saw a shimmering white ghost advancing toward me. Within seconds, a torrent of beer waste had engulfed my waders and the frothing foam billowed up around my legs. How high would the beer get? There are those who would gladly drown their troubles in drink, but this wasn't what I had in mind! The vile odor of the brewery sewer, where beer sat around in subterra-



*Beer waste draining into the Palace Avenue Sewer, 1999.*

nean pools for days before draining away, was beyond words.

But worse was ahead. We came to a passage lined with quivering jelly stalactites, up to a foot long, dangling from the vaults above. I found out later that the "jelly" is in fact well known to sanitation engineers as "sewer slime," or "pendant slime." One such slime, examined under the microscope by researchers, was found to be the product of a bacterial-fungal combination that secreted a substance called "zooglear matrix." The dual organism derived its sustenance from aerosols

generated from trade wastes at cascade points in the sewers. The function of the copious slime is to absorb and concentrate nutritive substances from the atmosphere.<sup>32</sup> Ethyl alcohol was found to be especially conducive to slime formation, and the role of the fungus is to provide a physical surface on which the bacterial slime producers can proliferate.<sup>33</sup> One researcher dubbed them "alcoholic slimes," which seems to fit best.<sup>34</sup> The brewery waste, which splashed into the Palace Avenue Sewer from pipes, had plenty of opportunity to generate aerosols. Indeed, at one point there was a crude shaft in the sandstone, containing what appeared to be a beer waterfall—probably leakage from above.

We found evidence that others, in the distant past, may also have witnessed this ghastly spectacle. In a nearby side-tunnel under Erie Street, laborers had cemented a horseshoe into the keystone of the sewer arch. Just hoping for the best?

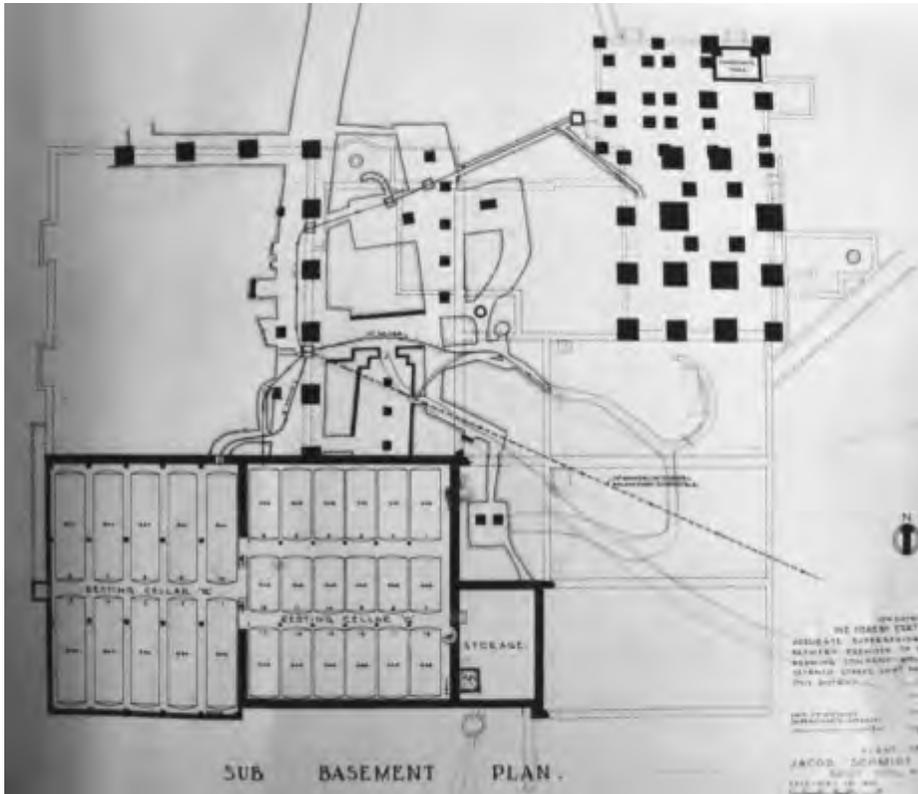
At the western end of the Palace Avenue Sewer we came to the famous Stahlmann's Cellars. I slithered from a small clay pipe into the enormous black void. My light illuminated a primeval forest of colossal yellow brick piers, which were swarming with giant red cockroaches. Rats scuttled among the breakdown slabs on the cave floor. Festoons of vapor hung lazily in the warm, fetid air. We began to sweat profusely, and removed our coats. While there were isolated patches of slime in the cave itself they were nothing



*Jelly stalactites in the Palace Avenue Sewer, 1999. After the brewery shut down, these living organisms died off.*



*Colossal brick piers hold up the cave ceiling below the Schmidt brew-house. Photo by Andrew Hine.*



Map showing the maze of cave passages below the Schmidt brewhouse, whose outline is visible as a dashed line. The Palace Avenue Sewer and other passages have been sketched in by an unknown hand. The black squares represent brick piers.

like that found in the sewer we had just passed through.

The square brick piers, the largest of which were six by six feet in size, supported the cave ceiling, and thus the tremendous weight of the Schmidt brewhouse above. The piers ran in rows, and from looking at the building's Sub Basement Plan it can be seen that they were positioned inside the cave to be directly under the load-bearing walls of the brewhouse, so it is obvious that they were constructed after the Stahlmann era.<sup>35</sup> The south-trending cave passages end abruptly at a massive limestone rubble wall—the outer wall of the lowermost resting cellars, built as cellars on the same level as the cave itself.

In 1999 the brewery was running full steam, producing Pig's Eye Pilsner and other brands. And I mean *steam*—there were noisy discharges of hot wastewater from the brewhouse into the cave through a brick-rimmed hole in the ceiling several times an hour. The steaming cascade splashed into a deeply eroded sandstone pit,

which contained a jumble of broken brickwork and other detritus. At the bottom, the pit drained by a large pipe that connected to the Palace Avenue Sewer by a long, looping passage through the sandstone. I well remember crawling among the rats and roaches to follow this slimy passage.

The chambers in the immediate vicinity of the steamy cascade, a low, gloomy maze of fermenting brickwork, felt like a sauna, reminding me of a visit to the Yampah Vapor Caves in Glenwood Springs, Colorado. Schmidt-related breweriana was seen scattered about in some of these chambers.

Stahlmann's Cellars proper (as shown on the 1884 map) is located beyond the footprint of the brewhouse and is thus devoid of brick piers. Following the passage heading north from the brewhouse maze into the main cellars, the dividing line between the two was nicely marked by a cold stream several feet wide and deep that crossed from one side of the passage to the other on its way to the Fort Street Sewer. This stream originated from the brewhouse water well.

Shortly after crossing this miniature River Styx, we arrived at the largest room in the cave, which was dubbed the Rotunda, after the similar appearing room in the Mammoth Cave of Kentucky, from which passages radiate outwards in several directions, just as they did here. Twin limestone boulders sat in the center of our Rotunda, on which we placed a lamp as a visual reference point, exploring outward in each direction.

The Rotunda is located under the brewery's Office Building. The passage heading northeast from the Rotunda led to a manhole, visible in the cave ceiling, at the top of a steel ladder. Covered with a 400-pound lid, this manhole provides access to the cave from the basement of the Office Building, and is the preferred entry point to the cave for the occasional newspaper reporter. As one such reporter glumly commented in 1993, "Anyone who knew anything about those caves is long dead."<sup>36</sup>

The passage heading southwest from the Rotunda contained the best stalactites in the cave, more than a foot long and quite drippy, forming rows along the intersecting joints of the limestone ceiling. Beyond the stalactites, a trio of vertical well pipes passed through the cave. These are the wells that supplied the much frequented pump house on Fort Road, which dispensed free "spring water" to the public for many years.<sup>37</sup>

Stahlmann's Cellars is such a maze that we inevitably got lost, despite having left several rock cairns to mark the route, as the old polar explorers used to do. Until we learned the maze better, I relied on compass readings to navigate. Even though I didn't recognize the exact passage for regaining the Rotunda, a general direction, like "head south," using any passage in the maze heading that way, proved effective. Away from the sewers, the cave was like a beach, floored with clean, dry sand. Apart from old pipe runs with deteriorated asbestos wrappings and newer PVC pipes zigzagging through the maze, this part of the cave was empty.

At the eastern extremity of Stahlmann's Cellars, a massive round arch of limestone rubble masonry and a stairway leading upwards toward Oneida Street, though choked with boulders, marked a



*A deep pit in the sandstone below the Schmidt brewhouse formed by the discharge of wastewater over many years. Photo by Andrew Hine.*



*The Rotunda, a large room in Stahlmann's Cellars from which cave passages radiate in several directions. Located under the brewery's Office Building. Photo by Andrew Hine.*

former entrance to the cave. These are not the same “STAIRS” shown on the 1884 map, however, which have been lost to sight under a roof collapse pile. The older stairway led down into the cave from the original Stahlmann brewhouse, which was demolished in 1919.<sup>38</sup>

From the northern outskirts of Stahlmann's Cellars, a sandrock passage runs toward the original Stahlmann mansion at 855 West Seventh Street (now called the Marie Schmidt Bremer Home), an Italianate villa that was constructed circa 1870.<sup>39</sup> Under the mansion itself we found a mysterious shaft, its walls coated with white flowstone, a natural mineral deposit left by flowing water. With a di-

ameter of three feet, this 30-foot shaft is large enough for a person to fit through, but its purpose is unclear. It brought to mind the kidnapping of Edward Bremer by gangsters in 1934, after which the family reportedly dug a tunnel from the mansion to the Rathskeller across the street.<sup>40</sup> This tunnel, now sealed by a wooden door, has nothing whatever to do with the cave, however, because it runs on top of the Platteville Limestone layer, whereas the cave is below this layer. Could the white shaft have been an alternate route?

We left Stahlmann's Cellars by a different way than we entered, following a 100-foot sandrock crawlway that began

under the Bremer mansion and led to the Fort Road Sewer. We were in for a nasty surprise, however, when some rats emerged from their burrows, squeaking in protest at the unexpected intrusion. After braving the whiskered gauntlet, and wading down the sewer trunk lines, we emerged into the open air once again. I quarantined my rucksack upon arriving home to forestall a potential infestation from insect “hitchhikers.”

In June 2002, Landmark Brewery shut down, while Gopher State Ethanol, the nation's first urban ethanol plant, which had begun production at the site in April 2000, continued in operation until May 2004, when it, too, shut down.<sup>41</sup> Almost



*A collapsed stairway inside Stahlmann's Cellars.*



*A mysterious shaft, coated with white flowstone, connects Stahlmann's Cellars with the Marie Schmidt Bremer Home above.*



Cave passage leading off from the Rotunda. Well pipes are visible in the distance. Photo by Andrew Hine.

two years later, we paid a return visit to Stahlmann's Cellars. It was an opportunity to see what changes, if any, the brewery closure had brought about in the underlying cave.<sup>42</sup>

The microclimate of Stahlmann's Cellars had changed dramatically during the seven-year interval since our first visits. Most notably, the cave was much cooler and drier because the brewery was no longer discharging hot wastewater through the cave. Back in 1999, I had measured the air temperature in the Rotunda as 70 degrees Fahrenheit (obviously, this was not a temperature maximum for the cave, rather what I would consider the average), and nearly 100% humidity. The same instrument in the same spot now registered 52 degrees F—the temperature you'd normally expect in caves at this latitude—and 90% humidity. The subterranean stream, which formerly sported among the giant brick piers, had also dried up, but probably because the brew-house well pump had been shut off.

In the absence of brewery waste, the cave life died off. No rats or cockroaches were seen this time. The living sewer jelly was gone too, having changed

color from a moist, white/orange slime to a dry, brown/black crud. By the same token, however, Stahlmann's Cellars has potentially become favorable habitat for other forms of cave life. While I don't recall having seen bats in the cave before or after the brewery shutdown, the cave has now cooled sufficiently to serve as a bat hibernaculum—enough for bats to get their body temperature low enough to enter hibernation, in a place where they are free from predation by rodents.

In February 2005, the Minnesota State Historic Preservation Office determined that the great castle-like Schmidt Brewery, which now sits vacant, was eligible for nomination to the National Register of Historic Places. Whatever the brewery's future use, hopefully the historic cave found in the depths below can also partake in the vision, commemorating the heritage of the great nineteenth-century German brewers of St. Paul and their endless, fascinating mazes.

### Acknowledgments

The author thanks Susan Appel, Andrew Hine, Paul Clifford Larson, the Fort Road Federation, the Minnesota State Historic

Preservation Office, and the Ramsey County Historical Society. This article is dedicated to the memory of Virginia Kunz, who encouraged the author to begin the "St. Paul Underground" series in 1995.

*Greg Brick is a college geology instructor, editor of the Journal of Spelean History, and recipient of the 2005 Peter M. Hauer Award from the National Speleological Society for his research in cave history. His first book, Iowa Underground: A Guide to the State's Subterranean Treasures, was published in 2004, and he is working on a second book, dealing with the caves of his native state, for the University of Minnesota Press.*

### Notes

1. Herbert Asbury, *The Great Illusion: An Informal History of Prohibition* (Garden City, N.Y.: Doubleday, 1950), 62. Reasons behind the national whiskey binge are well described by W. J. Rorabaugh, *The Alcoholic Republic: An American Tradition* (New York: Oxford University Press, 1979).

2. This point is strongly emphasized by John P. Arnold and Frank Penman, *History of the Brewing Industry and Brewing Science in America* (Chicago, 1933).

3. *One Hundred Years of Brewing*, supplement to *The Western Brewer* (Chicago: H. S. Rich & Co., 1903), 207. This oft-repeated claim, however, is disputed by others; see, for example, J. Burnitz Bacon, "Lager Beer in America," *Frank Leslie's Popular Monthly* 14 (August 1882): 213-17, who dates it much earlier.
4. William L. Downard, *Dictionary of the History of the American Brewing and Distilling Industries* (Westport, Conn.: Greenwood Press, 1980), see "Brewing Process."
5. Charles Edwin Dick, "A Geographical Analysis of the Development of the Brewing Industry of Minnesota" (PhD diss., University of Minnesota, 1981), 217-18.
6. James B. Bell, "Minnesota's First Brewery: Yoerg's Final Years, 1933-1952," *Ramsey County History* 31 (Summer 1996): 16-22, 27.
7. Thomas M. Newson, *Pen Pictures of St. Paul, Minnesota, and Biographical Sketches of Old Settlers* (St. Paul, 1886), 531.
8. Gary J. Brueggemann, "The Beer That Grew with the Great West End," *Community Reporter* 19 (October 1991): 1, 3. Brueggemann goes on to say that Stahlmann chose the site of his brewery because of "a cave near a cold stream, in the unsettled western edge of the city, close to the old wagon trail called Fort Road." To this author, Brueggemann's statement sounds very much like an allusion to the nearby Fountain Cave and Fountain Creek, which, however, had nothing to do with the brewery.
9. Gary J. Brueggemann, "Beer Capital of the State—St. Paul's Historic Family Breweries," *Ramsey County History* 16:2 (1981): 3-15.
10. An alternative origin is presented in *The Leading Industries of the City of Saint Paul, Minnesota* (New York: Reed & Co, 1881), 133-34, which states: "Its name is taken from the close proximity of numerous caves in the rocky banks of the Mississippi." In fact, as noted above, the only cave in the vicinity at the time, natural or artificial, was Fountain Cave.
11. "A Great Brewery," *St Paul Dispatch*, April 30, 1877. As for water supply, the 1885 Sanborn map shows artesian wells at the brewery.
12. John E. Land, *Historical and Descriptive Review of the Industries of St. Paul 1882-3* (St. Paul, 1883), 110-11.
13. See, for example, Mikael Hård, *Machines Are Frozen Spirit: The Scientification of Refrigeration and Brewing in the 19th Century: A Weberian Interpretation* (Boulder, Colo.: Westview Press, 1994), 37.
14. Susan K. Appel, "Artificial Refrigeration and the Architecture of 19th Century American Breweries," *Journal of the Society for Industrial Archeology* 16 (1990): 21-38.
15. The depth of the cave below the surface is indicated on the vertical cross-sections included on the sewer strip maps used by the St. Paul Public Works Department.
16. I have been unable to locate the original 1884 cave map.
17. Several different versions of the Sub Basement Plan are included in Andrew M. Hine, *Application for Determination of Eligibility for Historic Designation of the Jacob Schmidt Brewery, St. Paul, MN*, February 9, 2005, Appendix M.
18. Susan K. Appel, "Building Milwaukee's Breweries: Pre-Prohibition Brewery Architecture in the Cream City," *Wisconsin Magazine of History* 78 (Spring 1995): 162-199. The three-stage evolution of brewery refrigeration is concisely formulated in Appel, "Artificial Refrigeration," cited above. See also Chapter 26, "The Brewmaster as Mechanic and Engineer," in Stanley Baron, *Brewed in America: A History of Beer and Ale in the United States* (Boston: Little, Brown, 1962); Oscar Edward Anderson Jr., *Refrigeration in America: A History of a New Technology and Its Impact* (Princeton, N.J.: Princeton University Press, 1953); and *One Hundred Years*, cited above.
19. Paul Clifford Larson, *Schmidt Brewery Designation Study*, July 26, 2005, pp. 16, 25.
20. E. M. Sigsworth, "Science and the Brewing Industry, 1850-1900," *Economic History Review* 17 (1964): 536-50.
21. Ronald Feldhaus, *The Bottles, Breweriana, and Advertising Jugs of Minnesota, 1850-1920*, v. 1. (Minneapolis: 1986), 40. The words "Cave Brewery" continued to appear, however, in city directory advertisements.
22. Josephine Marcotty, "Shedding Light on 'The Caves': Brewers Pull Up Manhole Cover, Explore St. Paul's Nether World," *Minneapolis Star Tribune*, January 29, 1993. Much of the vibration, and hence collapse, is probably related to twentieth-century motorized traffic.
23. Brueggemann, "Beer Capital." The elder Stahlmann is usually said to have died from tuberculosis, but his obituary states otherwise. See "Death of Chris. Stahlmann," *Saint Paul and Minneapolis Pioneer Press*, December 4, 1883. Adam D. Smith, in *The History of the Stahlmann Family*, 2003 (included in Hine, *Jacob Schmidt Brewery*, Appendix D) also disputes the tuberculosis assertion.
24. Larson, p. 8.
25. *St. Paul Pioneer Press*, August 4, 1901.
26. "Modern Brewery in St. Paul," *The Western Brewer, and Journal of the Barley, Malt and Hop Trades* 26 (November 15, 1901): 453. Yoerg's, a much smaller St. Paul concern, was exceptional among local brewers in touting its "Cave Aged Beer" as late as 1952, when it closed down; see Bell, "Minnesota's First Brewery."
27. Jacob Schmidt Brewing Co, *Our History* (St. Paul, 1972).
28. Kathy Vadnais, "Schmidt Brewery Deal Set," *Community Reporter* 19 (October 1991): 1. The Minnesota Brewing Company memorialized Stahlmann's Cellars with their "Brewer's Cave Handcrafted Beers," which included a fanciful rendering of the cave interior along with the story of Christopher Stalman.
29. Larson, pp. 5, 6.
30. Brueggemann, "Great West End."
31. I calculated a length of 30 miles for the labyrinth by painstaking measurements from the 1 inch: 500 feet sewer maps used by St. Paul Public Works. My exploration of the labyrinth as a whole, a largely solo endeavor, is described in an unpublished twelve-page manuscript, "The Fort Road Labyrinth."
32. P. J. Matthews, "Growth Characteristics of a Sewer Slime," *Environmental Pollution* 10 (1976): 79-88.
33. S. F. B Poynter and G. C. Mead, "Volatile Organic Liquids and Slime Production," *Journal of Applied Bacteriology* 27 (1964): 182-95.
34. E. Windle Taylor, "Alcoholic Slimes," *Rep. Res. Bact. Chem. Biol. Exam. Lond. Waters* 38 (1958): 24.
35. *The Western Brewer* states, "Deserving of especial mention is the difficulty in constructing the foundations, as for the chimney, boiler and stock house, it required going to a depth of thirty feet in order to secure safe support for the weight above." According to the building permit (No. 38813, August 12, 1901, St. Paul Building Permits Collection, Ramsey County Historical Society, St. Paul, Minn.), the foundation was to be laid on "sand rock" (the St. Peter Sandstone), which could be interpreted as the cave floor. It may be, however, that the brick piers date to Walter Magee's massive upgrading of the facility in the years after Prohibition.
36. Marcotty, "Shedding Light on 'The Caves.'"
37. "Schmidt Brewery Will Cease Dispensing Free Spring Water," *Modern Brewery Age* 41 (July 2, 1990): 1.
38. Larson, p. 16.
39. Historic Sites Survey, Ramsey County Historical Society. The Bremers later donated the mansion to the Wilder Foundation.
40. Paul Maccabee, *John Dillinger Slept Here: A Crooks' Tour of Crime and Corruption in St. Paul, 1920-1936* (St. Paul: Minnesota Historical Society Press, 1995), 299.
41. Doug Mack, "What's Brewing at Schmidt?" *Preservation Journal of Saint Paul* 3 (Spring 2005): 1, 6.
42. Owing to St. Paul's sewer separation program, which severs subterranean travel routes, the cave was much harder to get to this time. We had to enter the sewer labyrinth by way of a remote aperture and traverse a lengthy detour, a total distance of one mile to the cave. Unfortunately, adventure-seeking youths learned of the cave's existence in 2001 from an easily available on-line article and by now it has become common knowledge on the Web; see Mike Mosedale, "Notes from Underground," *City Pages*, October 17, 2001.



*The Stahlmann Cave Brewery as depicted on the company letterhead. Courtesy of Paul Clifford Larson. See article beginning on page 12.*

**R.C.H.S.**  
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