

## EDMUND JUNGENFELD OF ST. LOUIS AND HIS IMPACT ON 19th-CENTURY AMERICAN BREWERY ARCHITECTURE

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In 1911, Frederick Widmann of St. Louis, Missouri, then a noted brewery architect himself, looked back on the history of American brewery architecture and distinguished three periods in its development. An initial 'primitive' phase characterized the period up to 1860, he said, when 'many small plants ... scattered all over the country ... [were] erected by the proprietor without the assistance of an architect or engineer'.<sup>1</sup> Widmann's important second period, which he dated 1860-1880, saw a new approach, when

men of experience in the architectural and engineering line made a deep study of brewery structures and equipments, and the result was the erection of very creditable plants throughout the country.<sup>2</sup>

The new spirit of this second phase was crucial to the emergence of Widmann's third period, extending from 1880 to his own day, which he rightly saw as a kind of Golden Age in American brewery history.

Instrumental in laying the groundwork for that Golden Age, Widmann stated, were significant individual designers of the preceding period, four of whom he recognized as especially prominent: 'Men like Stoll and Pfund of New York, F.W. Wolf of Chicago, and Edmund Jungenfeld of St. Louis are beyond question the pioneer architects and engineers of breweries in this country ...'<sup>3</sup> All four of these men were German-born and most German-trained, and all of them began to work with American breweries in the later 1860s and 70s. That put them in an industry on the cusps of great change, and their inventiveness was a match for the many other forces of the time that together were reshaping the brewery. This essay focuses on the youngest and short-

est-lived of those pioneer figures, Edmund Jungenfeld of St. Louis, in an effort to see more clearly what Widmann meant when calling Jungenfeld and others 'pioneer' brewery architects. Investigating what can be learned of Jungenfeld beyond Widmann's brief description will shed light on how a trained architect/engineer helped to revolutionize American breweries and to inspire others to take up a new and prosperous specialty within the maturing field of American 19th-century architecture. Along the way, such investigation will demonstrate that, while they have often gone uncredited and ill-considered, brewery architects like Jungenfeld deserve greater acknowledgment for building life-long careers dedicated to creating such industrial masterpieces as these breweries often became.

Frederick Widmann, quoted above, knew Edmund Jungenfeld well, since Widmann, himself born in Germany in 1859, had begun his professional career in the architectural office of Walsh and Jungenfeld, St. Louis, in the mid-1870s. Widmann was one of several to join Jungenfeld when he formed his own firm about 1881 or before.<sup>4</sup> Following Jungenfeld's untimely death in 1884, Widmann, along with Robert W. Walsh and Caspar D. Boisselier, would continue to operate the firm of E. Jungenfeld & Co. with distinction, keeping Jungenfeld's name in the industry's eye to nearly the end of the century, when the principals finally changed the firm's title to Widmann, Walsh and Boisselier.<sup>5</sup>

So who was this Edmund Jungenfeld [Fig. 1], that his name should carry such weight in the history of American brewery architecture? A biographical account published in May, 1884, reported that Jungenfeld had been born in Mayence (Mainz), Germany in 1841 (some



Figure 1. Portrait of Edmund Jungenfeld, Architect, St. Louis. Source: *The Western Brewer*. IV, 5, May 1884, unpagged supplement.

sources say 1839). He studied at the polytechnic schools in Darmstadt, Karlsruhe, and Paris, then traveled widely, including to England, France, and Italy, while finding employment over several years with various railroads. In the spring of 1864 he emigrated to the United States, locating in St. Louis permanently.<sup>6</sup> He first appeared as an architect in the St. Louis city directory of 1868,<sup>7</sup> and as a partner in the firm of (Fred E.) Reichard & Jungenfeld in 1869 and 1870.<sup>8</sup>

By 1871, however, Jungenfeld had moved up to become a partner in one of the most prominent of St. Louis architectural firms, Walsh & Smith, which then became Walsh, Smith & Jungenfeld. Thomas Waryng Walsh, born and trained in architecture in Ireland, had built a strong reputation in St. Louis from the 1850s, when the city was rapidly expanding: its 1850 population of 77,860 grew to 160,773 by 1860. Walsh became especially well-known for a number of important local commercial and public buildings, and his office expanded with his reputation, soon including not only a new

partner in Jungenfeld, but also younger personnel, like Thomas Walsh's son, Robert W. Walsh, and Frederick Widmann.<sup>9</sup> Walsh's earlier partner, the British-born James Smith, soon left the firm, so that in 1874 it became Walsh & Jungenfeld,<sup>10</sup> a firm prominent enough to warrant an appearance in the 1876 Compton & Dry pictorial atlas of St. Louis.<sup>11</sup> The text for that volume credited Jungenfeld specifically with such public projects as the State Blind Asylum, Jacksonville, IL; the Soldier's Orphans' Home, Bloomington, IL; the State Normal School, Carbondale, IL; the Northern Insane Asylum, St. Joseph, MO; and 13 school houses for the St. Louis Board of Public Schools. More significant for his coming work and for this essay was Jungenfeld's being credited with planning and supervising construction of the Bavarian Brewery.<sup>12</sup>

The Bavarian Brewery, St. Louis, will serve here to demonstrate several important changes that characterized brewing and brewery architecture in that city and throughout the United States in the second half of the 19<sup>th</sup> century. One of those changes is referred to very directly in the name of this brewery, and that is the 'Germanizing' of the American brewing industry. Secondly, while the Bavarian Brewery was initially small and insignificant, it would not remain so, as, like others that began small, the Bavarian grew substantially, especially in the wake of the Civil War. Growth was spurred by technological developments and new marketing strategies. Additional considerations like refrigeration and bottling put new spatial demands on the facilities, leading to new architectural solutions to new issues in brewing. As brewing became more demanding, the design of buildings began to be handled by architects, whose professional training gave them the skills to create new kinds of buildings that made the American brewery a new kind of place. The story of the Bavarian Brewery and Edmund Jungenfeld's role in its development shows how the fact of a talented architect's involvement facilitated the brewer's dealing with all of these and many other changes in brewing, in this case, laying the groundwork for one of the most successful of American breweries, eventually known as Anheuser-Busch.

To focus on the Bavarian Brewery is to return initially to that 'primitive' first stage of American brewery architecture. Started in a small wooden structure by George Schneider in 1852, the Bavarian Brewery was rebuilt in

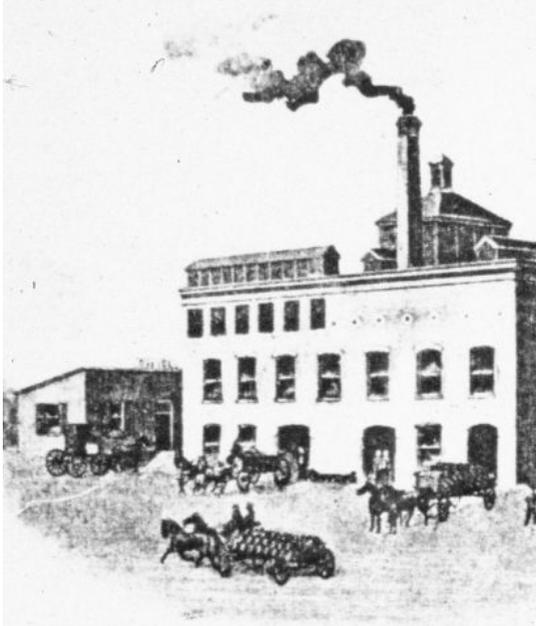


Figure 2. St. Louis, MO: Bavarian Brewery, Brew House of 1856-7. Source: Anon. (1903) *One Hundred Years of Brewing*. Chicago: J.W. Wing & Co., p.348.

brick c.1856-7 [Fig. 2], in a manner that can only be called ‘vernacular’ in nature, i.e., built primarily in a functional manner without any particular ‘style’. The brewery passed through a series of other owners until, in 1860, it landed in the hands of its owners’ creditors, the soap manufacturer Eberhard Anheuser, born in Rhenish Prussia in 1805<sup>13</sup> [Fig. 3] and his partner, William D’Oench.<sup>14</sup> Neither was trained as a brewer, yet they continued to operate the brewery as E. Anheuser & Co. until D’Oench retired in 1864 to return to earlier interests, and Anheuser found himself stressed by trying to run two separate businesses at the same time. His search for someone to help with the brewery led him to someone he already knew, both in business and personally, and the man who proved the perfect person for the job.

Adolphus Busch [Fig. 4] had married Anheuser’s daughter Lilly in 1861,<sup>15</sup> and had spent some years in the brewers supply business, which is probably where Anheuser first met him. Anheuser took Busch into E. Anheuser & Co. in 1865, and his choice was clearly a good one. Within five years of Busch’s arrival, sales were up 125%, and Anheuser had given Busch almost a

free hand in operating the brewery.<sup>16</sup> Success continued, and in 1875, the firm incorporated as a stock company called ‘E. Anheuser & Co.’s Brewing Association’, with Anheuser as President and Busch as Secretary and Treasurer.<sup>17</sup> Busch’s impact was such that, in 1879, the firm’s name was changed yet again, to the ‘Anheuser-Busch Brewing Association, in compliment to Mr. Adolphus Busch, to whose rare executive ability the concern owes its great success’.<sup>18</sup>

Thus it was that, in the period from the mid-1860s on, the fortunes of both Edmund Jungenfeld and Adolphus Busch had begun to rise substantially in St. Louis. The link between them was more than just parallel timing or location. It was Jungenfeld’s work for Busch at Anheuser’s Bavarian Brewery, beginning in 1869, that helped to establish the architect’s primary direction for the rest of his career, as it was Busch’s choice to use Jungenfeld’s architectural skills that totally transformed the Bavarian Brewery over time. Together, Busch and Jungenfeld helped to bring the very nature of brewery architecture into a whole new stage of development, in St. Louis and beyond.



Figure 3. Portrait of Eberhard Anheuser, St. Louis. Source: Anon. (1903) *One Hundred Years of Brewing*. Chicago: J.W. Wing & Co., p.348.



Figure 4. Portrait of Adolphus Busch, St. Louis. Source: *The Western Brewer*. VII, 11, November 1882, unpagged supplement, following p.1582.

The origins of both Busch and Jungenfeld reflected very directly the growing prominence of German-born brewers and architects in St. Louis brewing circles by the 1860s. This was no fluke, but an inherent part of the interlocked set of changes coming into the American brewing industry in the second half of the 19<sup>th</sup> century. One of the most basic of these was the shift in American brewing, from the 1840s, away from its earlier reliance on English brewing methods and toward the somewhat different techniques of German brewing. English ales and related brews were not disappearing, but German lager beers were growing dramatically in popularity, a fact easily seen in the German names of the major figures mentioned thus far. The shift to lager was motivated in large part, of course, by the enormous numbers of German immigrants flooding into the United States. Their taste for lighter, more refreshing lager beers spread in time to other Americans, who by the 1870s were increasingly inclined more to lager than to ale.<sup>19</sup>

Major differences in these brewing techniques included the yeast each process used in fermentation. English

ales resulted from yeast that fermented at the top of the fermenting tank, while the yeast in German lagers fermented at the bottom. More important in terms of the architectural requirements of breweries was that lager needed a much longer aging period (several months initially) in much colder, near-freezing temperatures. This led lager brewers for a long time to dig underground vaults or to modify caves to take advantage of the earth's natural cooling, frequently augmented with natural ice cut from frozen rivers and ponds to bring their beers slowly to maturity. These circumstances also limited brewing to the colder months of the year, a limitation that sometimes clashed with the growing demand for lager.<sup>20</sup>

At the Bavarian Brewery, the increase in business during Adolphus Busch's first years was enough to require a new and larger brew house, and it was Edmund Jungenfeld whom Busch chose to design it. Jungenfeld's 1869-70 brew house for the Bavarian Brewery was the one noted in *Compton & Dry* (1876), and it was probably the first architect-designed brewery project in St. Louis. It was facilitated, in part, by Busch's 1869 liquidating of his earlier partnership in the brewers supply business mentioned above. Freed of his previous ties, Busch could concentrate his attention on the brewery, and he now had capital that could help fuel its expansion.<sup>21</sup> No documents yet explain specifically what brought Busch and Jungenfeld together, but it could not have hurt that both men shared a birthplace in or near Mainz, Germany, and were of similar ages,<sup>22</sup> or that both were ambitious and attuned to the possibilities of the post-Civil War industrial boom then emerging. Each offered the other important opportunities, and each would benefit from their mutual immersion in the brewing industry. As Busch was later lauded for his executive ability, so too was Jungenfeld, for his intellectual dedication to understanding the architectural and related needs of brewing:

In 1869 his townsman, Adolphus Busch, Esq., employed him [Edmund Jungenfeld] to build his first brew house, and through the growth of the Anheuser-Busch Brewing Association, and their rapidly increasing demands for facilities, he was obliged to devote more and more of his time to the training and studying of the smaller details, and the theories of brewing, so as to distinguish what was needful and useful in all the branches of this important business ... thus studying and gaining the wisdom and understanding of the brewery business in all its branches ...<sup>23</sup>

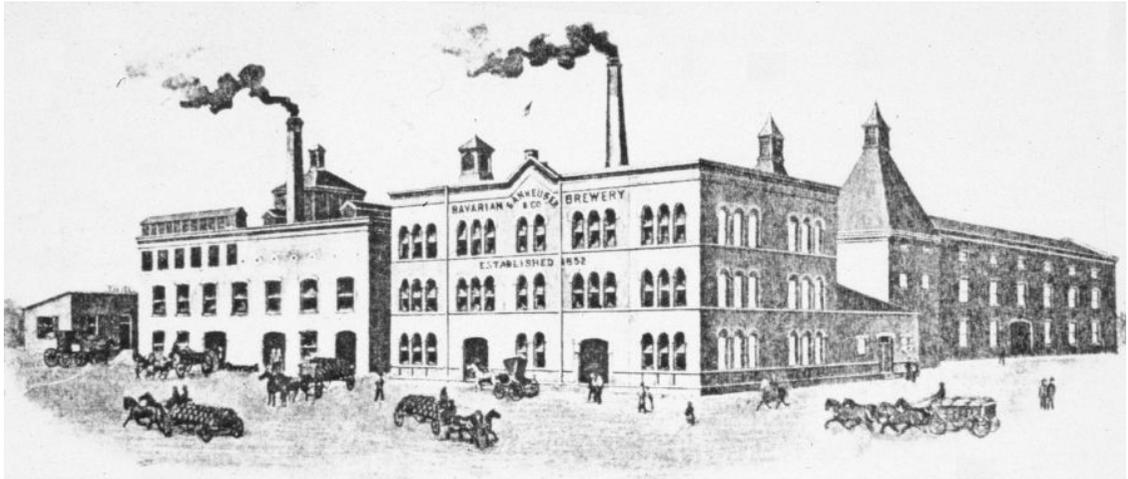


Figure 5. Edmund Jungenfeld, architect: Brew House, Bavarian Brewery, St. Louis, 1869 (with 1856-57 Brew House at left). Source: Anon. (1903) *One Hundred Years of Brewing*. Chicago: J.W. Wing & Co., p.348.

Jungenfeld's connection with Adolphus Busch, then, was crucial, not only to an important personal relationship, but also to Jungenfeld's eventual standing as one of the pioneers of architect-designed American brewery architecture. One might speculate, too, whether Jungenfeld's initial work for Busch in 1869-70 was the stimulus for the architect's move into the Walsh & Smith firm the very next year. Whatever the case, Jungenfeld and Busch clearly meshed effectively: Jungenfeld became *the* architect for Anheuser-Busch through the rest of his career, and his successors carried on that close association with this brewery virtually to the time of National Prohibition in 1920.

Jungenfeld's 1869 brew house for Busch [Fig. 5] also spoke to widespread stylistic changes being seen in brewery architecture of the post-Civil War era. His design featured a rectangular plan about 62' wide by 30' deep, and three stories and about 26' high.<sup>24</sup> One long wall served as the main façade, emphasizing the horizontal direction, and was laid out as a symmetrical five-bay front with a shallow central pavilion. The pavilion was gabled, but the other bays were capped by continuous flat cornices below a very shallow-pitched roof, with a small cupola at one end and a smoke stack beyond. Windows in the façade were arranged in regularly spaced and vertically aligned groups of three in four of the bays, in groups of two in the pavilion, and large wagon doors were set in the second and fourth

bays at ground level. While all of these features broke up the overall plane of the wall surface, they did so only slightly and in an orderly fashion that balanced voids with solid areas of wall. The end result differs greatly from the earlier brew house immediately adjacent.

The effect in the new brew house was that of a simplified version of the *Rundbogenstil*, the German 'round-arched style', seemingly imported from 19<sup>th</sup>-century German architecture, if also related to what is often called in the United States the Early Romanesque Revival, with overtones of the Italianate style. I prefer the German name, however, because I believe the choice of this style intentionally expressed German-born brewers' pride, both in their origins and in their increasing success against the formerly dominant English tradition in American brewing. Earlier, in Germany, the *Rundbogenstil* arose in part from concerns for finding an expressive national style for German 19<sup>th</sup>-century architecture, specifically in an argument originating in the written and built work of architect Heinrich Hübsch.<sup>25</sup> In America, this style appeared often in the wave of German-American breweries built or rebuilt during or shortly after the Civil War, as brewers chose a more style-conscious manner of building, instead of plainer, traditional vernacular modes. Another example of this phenomenon, more ornamental than Jungenfeld's design for the Bavarian Brewery, was the Lion Brewery of Windisch, Muhlhauser & Bro. [Fig. 6], opened in



Figure 6. Cincinnati, OH: Windisch, Lion Brewery of Windisch, Muhlhauser & Bro., advertisement. Source: The Western Brewer. VI, 11, 1881, p.1406.

Cincinnati on 1 January 1867.<sup>26</sup> While the Lion Brewery is gone, Cincinnati had - and still possesses - several significant *Rundbogenstil* brewery buildings from this period; others could be found in a number of other Midwestern cities, although almost none of them remains or can be credited to a specific architect.<sup>27</sup> St. Louis likely had several besides the Bavarian, but none of them has survived, nor are architects' names yet associated with any but Jungenfeld's.

Jungenfeld's involvement in the architecture of brewing extended beyond style to other aspects of a brewery's typical activities. Along with the brew house he built for Busch in 1869-70, Jungenfeld added a new malt house to the Bavarian plant, visible behind the new brew house in Figure 5, the tall cupolaed pyramidal roofs marking its malt kilns. He likewise constructed additional cellars, which were most likely traditional underground vaults. Together, these new facilities increased the brewery's annual capacity to 25,000 barrels of beer per year,<sup>28</sup> where, by contrast, the brewery's sales in 1865 had totaled only 8,000 barrels.<sup>29</sup> Actual

production by 1874 was 23,560 barrels, showing that E. Anheuser & Co. was growing fast, in part due to Jungenfeld's improvements. Still, the brewery remained only the third largest in St. Louis, behind the William J. Lemp and Fritz & Wainwright breweries (then producing 41,872 and 24,051 barrels respectively).<sup>30</sup>

By the 1870s the push to brew more and more lager began to make clear the limitations of underground lagering vaults, as well as the brew and malt houses that supplied them. Many began investigating more efficient and larger facilities in which to age increasing quantities of lager in properly cool temperatures. Edmund Jungenfeld was among numbers of other early brewery architects, engineers, and inventors who were exploring new means of cooling lagering facilities in this period. His efforts would begin to appear at the Bavarian Brewery as part of the next major building period, at the end of the 1870s.

Meanwhile, Adolphus Busch hit on yet another way to build up his brewery - by bottling lager on a large scale,

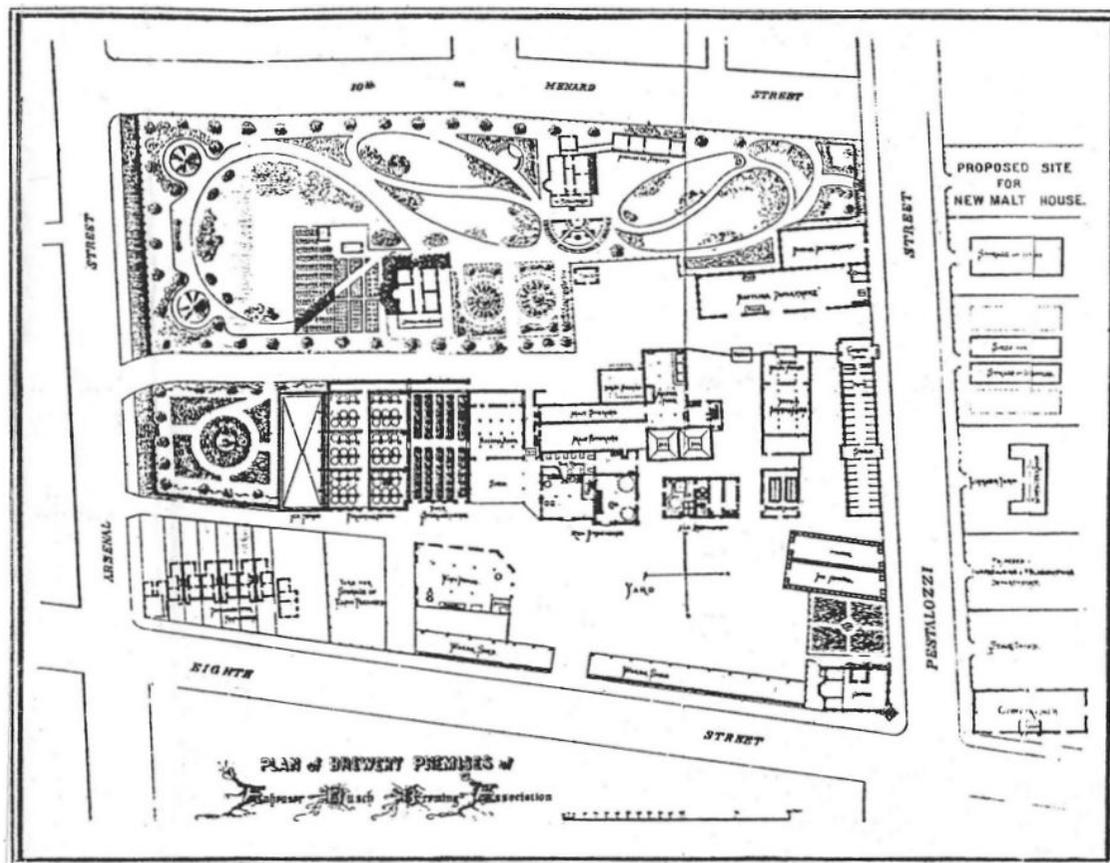


Figure 7. Edmund Jungenfeld, architect: Site plan, Anheuser-Busch Brewing Association, St. Louis, 1879. Source: *The Western Brewer*. IV, 12, detail of unpagged supplement.

specifically as a means of distributing it successfully far beyond the St. Louis area, therefore (he hoped) expanding markets exponentially. Developing bottling on such a scale was a new and complicated undertaking, but it was also the impetus to tremendous growth in production and facilities at Anheuser-Busch, and to the extension of brewery-related refrigeration in new directions. Largely through the advances in bottling he instituted beginning in the early 1870s, Busch was able, at last, to bring Anheuser-Busch to the position of leading brewery among the 25 operating in St. Louis in 1885.<sup>31</sup>

Adolphus Busch began shipping bottled beer experimentally to several Texas towns in 1872, only a start to what would become a nationwide, then international business. Busch's investigation of bottling on a large scale and

mastery of techniques to keep bottled beer cold and fresh during long-distance shipping brought out his extraordinary skills. Among other factors, he successfully developed facilities and equipment for bottling, applied Louis Pasteur's new principle of pasteurization to keep bottled beer fresh longer, took advantage of and pushed further recent advances in refrigerated railroad cars, while making savvy use of the post-Civil War expansion of American railroads as his primary means of transporting his beer far and wide.<sup>32</sup> Today we take for granted the availability of bottled beer everywhere, but in many respects we owe that fact largely to Adolphus Busch, as was recognized in the industry as early as 1882:

Mr. Busch was one of the first of our brewers to see the importance of bottling the product of his own vats, and may

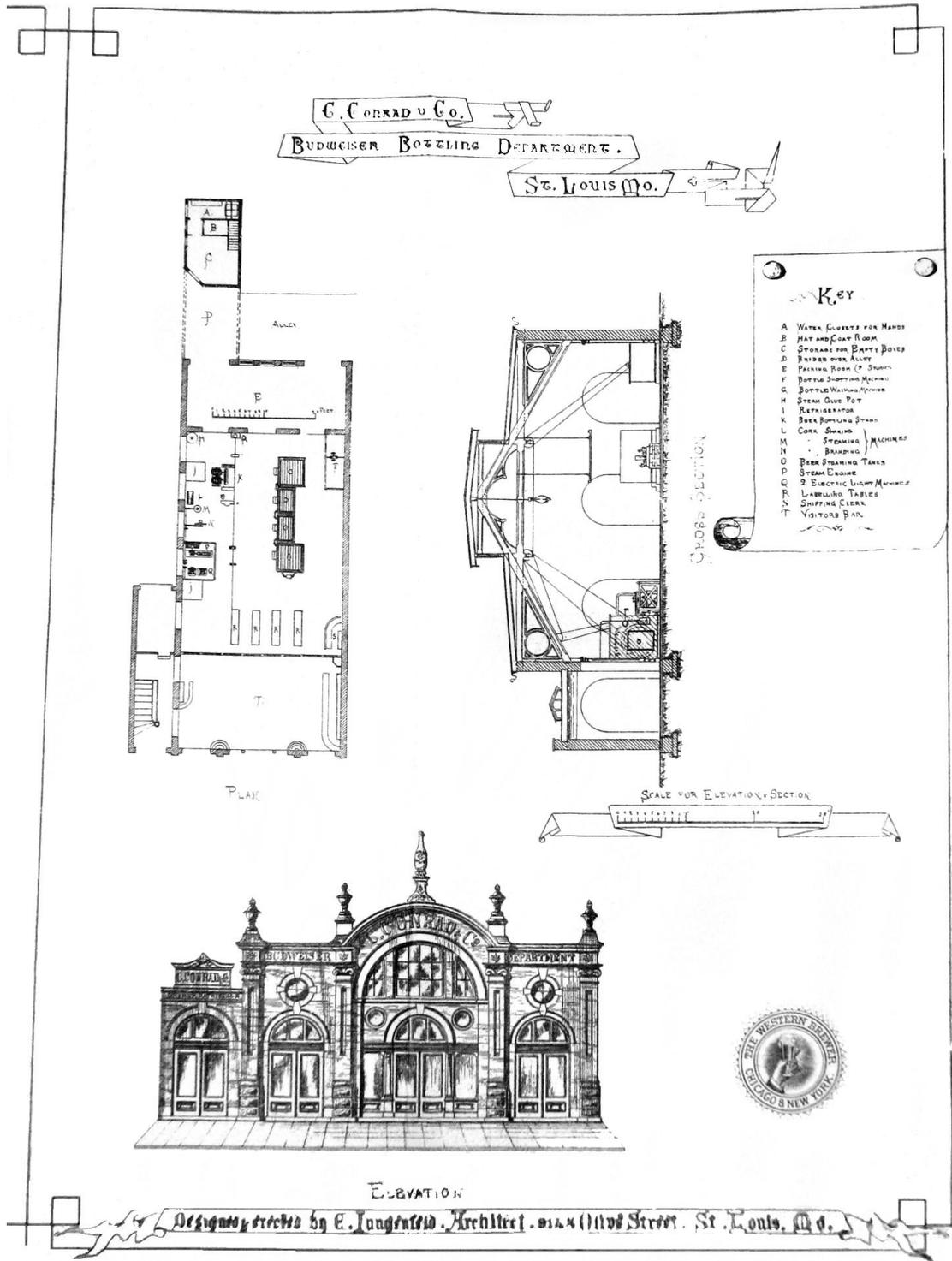


Figure 8. Edmund Jungensfeld, architect: C. Conrad & Co's Budweiser Bottling Department, St. Louis, 1879. Source: The Western Brewer. IV, 12, December 1879, unpagged supplement.

justly be said to have been the father of this branch of the business in America.<sup>33</sup>

Busch's rapid development of bottling and the markets for it was what ultimately lifted Anheuser-Busch to the status of a national-level brewer.<sup>34</sup>

Architectural evidence of the growth spurt that arose from the new emphasis on bottling at the brewery began to appear at E. Anheuser & Co.'s Brewing Association in late 1876 and 1877. A St. Louis newspaper reported in January 1877 that E. Anheuser & Co.

were compelled not long since to make an extensive addition to their bottling department, but its capacity is already over-taxed, and ground will soon be broken for a new building, which will fully double the present facilities.<sup>35</sup>

Unfortunately, no immediate visual records or architectural description appears to survive for these bottling facilities, nor has Jungenfeld been specifically connected with their design. However, the architect's close relationship with Adolphus Busch before and after 1877 is reason to assume Jungenfeld was responsible. Further, an 1879 site plan of the brewery [Fig. 7], based on E. Jungenfeld & Co.'s drawings, showed the bottling department on the upper right, if only as a long rectangular building, one short end facing onto Pestalozzi Street. Still, the location of this building, set behind and removed from the old and new brew houses discussed above and below, is instructive. Bottling's separation from other production facilities reflected the U.S. government's response to the sudden rise of bottling. Federal taxes were at that time based on the number of barrels of beer a brewery produced, each barrel stamped to verify payment of tax. Because bottling direct from the aging cellars threatened established taxation procedures, new rules were instituted as bottling increased, 'requiring transit of casks over a public highway'<sup>36</sup> before beer could be bottled. This practice assured that beer was being properly measured and taxed first, and it served government needs well enough that the rule separating bottling houses from brewing and aging facilities at breweries lasted into the mid-1890s.

Another glimpse of 1870s bottling involved the bottling of a beer still centrally related to Anheuser-Busch. Budweiser, which resulted from a collaboration between Adolphus Busch and his friend, Carl Conrad,

was originally brewed at the Anheuser brewery, but bottled by a separate company, C. Conrad & Co., in its own facilities. The new brand appeared in 1876,<sup>37</sup> its fame soon assured, and by August 1879, Jungenfeld was reported to have just finished a model bottling establishment for C. Conrad & Co. [Fig. 8]. The building was 76' across its front by 124' deep, with steam tanks, cork steaming, branding, bottle washing machines, etc., the whole lit electrically.<sup>38</sup> This brief description alludes to a structure of some size, with the kind of mechanized operations that would have reflected as well the increasing concern of the period with labor-saving equipment and processes in the brewery. C. Conrad & Co. bottled Budweiser exclusively until 1883, when the Anheuser-Busch brewery finally took it over.<sup>39</sup>

As bottling spurred expansion at E. Anheuser & Co., Adolphus Busch in 1876 requested that Edmund Jungenfeld draw up new plans for the rapidly growing plant.<sup>40</sup> Current facilities were being overwhelmed, as could be seen in the fact that Jungenfeld's previous brew house of 1869 had been designed for a production level of 25,000 barrels per year, but 'the rapidly increasing business has strained its capacity to over 100,000 barrels last year [1878]'.<sup>41</sup> Significantly, Busch and Jungenfeld did not attack this problem piecemeal; instead, they worked out a plan that not only resulted in better facilities in the short run, but also laid out expected needs for the future. Even as bottling facilities expanded, another whole series of buildings was about to be added to the brewery grounds through 1879, based, as *The Western Brewer* put it, 'upon a previously matured plan so as to form one organic whole'.<sup>42</sup> This is remarkably early for a reference to such a coherent overall plan for a growing brewery, and it speaks directly to the impact of a professionally trained architect on the shaping of this plant.<sup>43</sup>

One of the first outcomes of the 1876 plan was a major project announced in January 1879, but begun late in the previous year, that grew substantially over the coming months. Initially, it was said to include cellars whose capacity added space for another 12,000 barrels of beer, a wash house, a pitching house (the latter two for cleaning and resealing of barrels), and an ice house capable of holding 12,000 tons of natural ice. In February, Jungenfeld was noted as supervising construction of an additional element, a new racking room (where finished beer was packaged in barrels and kegs), which had its

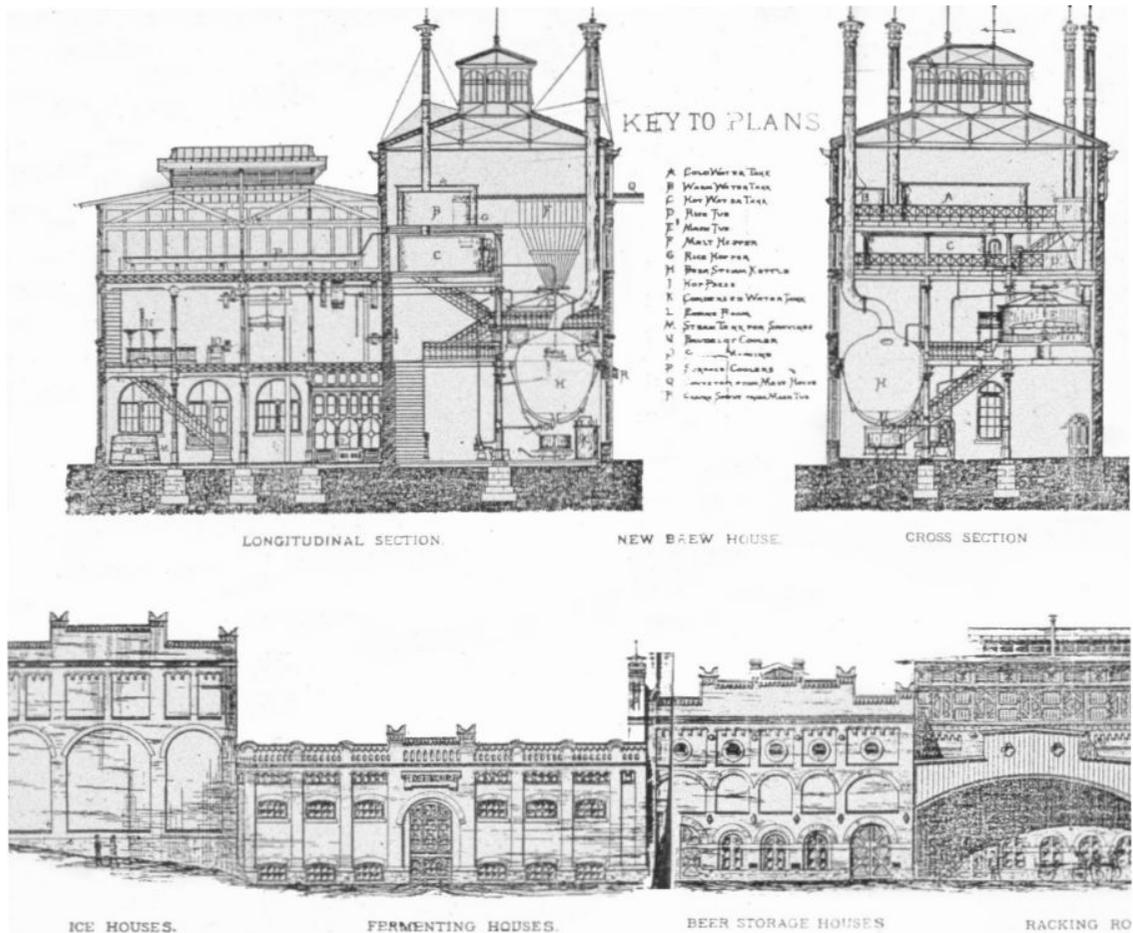
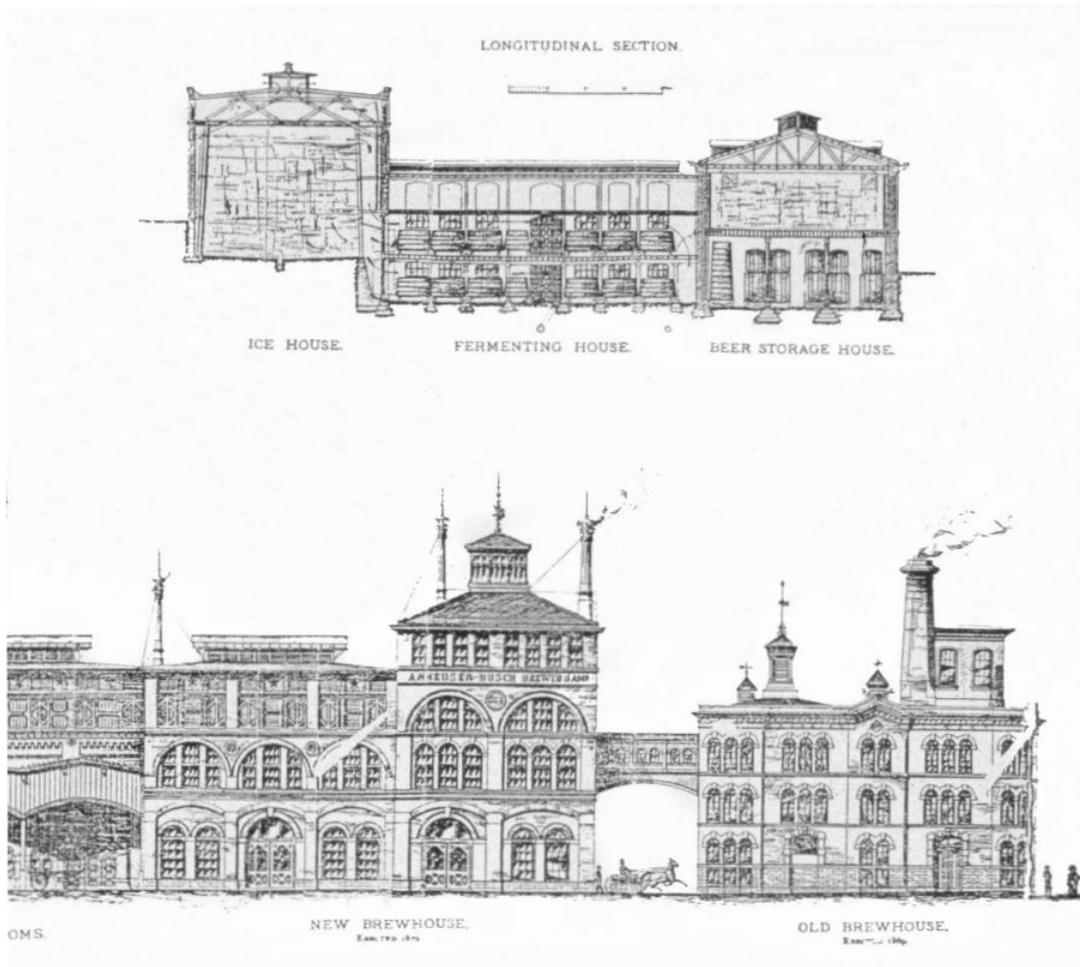


Figure 9. Edmund Jungfeld, architect: Additions to Anheuser-Busch Brewing Association, St. Louis, 1879. Source: *The Western Brewer*, IV, 12, December 1879, unpagged foldout supplement.

own ice chamber above.<sup>44</sup> In March, Jungfeld was said to have completed the ice house during the past winter,<sup>45</sup> and April brought the announcement that Jungfeld, now said to be the St. Louis partner of Theo. Krausch & Co. (to whom we will return shortly), was making plans as well for a new brew house for E. Anheuser Brewing Association.<sup>46</sup> By May the various earlier references were pulled together, and the project summarized as including three vaulted cellars, four ice storage houses of 1,200 tons capacity each, a wash house, a pitching shed (60 x 90'), a racking room with ice house above (50 x 70'), and the new brew house, now under construction.<sup>47</sup> The amount of publicity across several months suggests that these additions were seen in the industry as significant.

Finally, in December 1879, *The Western Brewer* published a glowing report on the new additions, titled 'Great Breweries of the World: The Anheuser-Busch Brewing Association, St. Louis', and supplemented with a remarkable fold-out illustration of the renovated plant that the journal claimed to be 'the largest engraving ever published in any paper'.<sup>48</sup> This black-and-white foldout illustration included elevation drawings of the major new buildings, a longitudinal section of the ice house/fermenting house/beer storage house group, sections and upper-story plans of the new brew house, and a general site plan of the entire Anheuser-Busch plant. The wealth of images also demonstrated the importance *The Western Brewer* saw in this set of projects, as the additions provided a clear example of the increasing complexity of the



up-to-date brewery Busch and Jungenfeld envisioned. Further, I would argue that these images give key evidence of the architect's innovative thinking, and the new directions he was moving, both visually and functionally.

All of Jungenfeld's 1879 additions were of brick, most likely red brick (the standard even today at Anheuser-Busch). Visually, they formed a continuous horizontal row of buildings of varying heights, but generally relatively low [Fig. 9]. Their facades shared, if not consistently, architectural features like round-headed and segmental arches, pilasters that divided facades into sections, corbel arcading along some upper edges of forms, and seemingly flat or parapeted rooflines, some accentuated with pairs of simple decorative finials that would be

repeated in diverse Anheuser-Busch buildings for so many decades that they became a kind of signature of the firm.<sup>49</sup> The consistency of formal language here helped tie the several diverse buildings together coherently. At the same time, there was much visual variety among the facades, a fact that helped distinguish elements from one another. As breweries continued to evolve in coming decades, their architects commonly gave visual distinction to the varied functional elements of breweries, not for decorative reasons alone, but also as part of the effort to facilitate the particular needs of the brewery's various processes. That inclination is already visible here.

Some such distinctions are clear in the 1879 Anheuser-Busch ice house, fermenting and beer storage houses

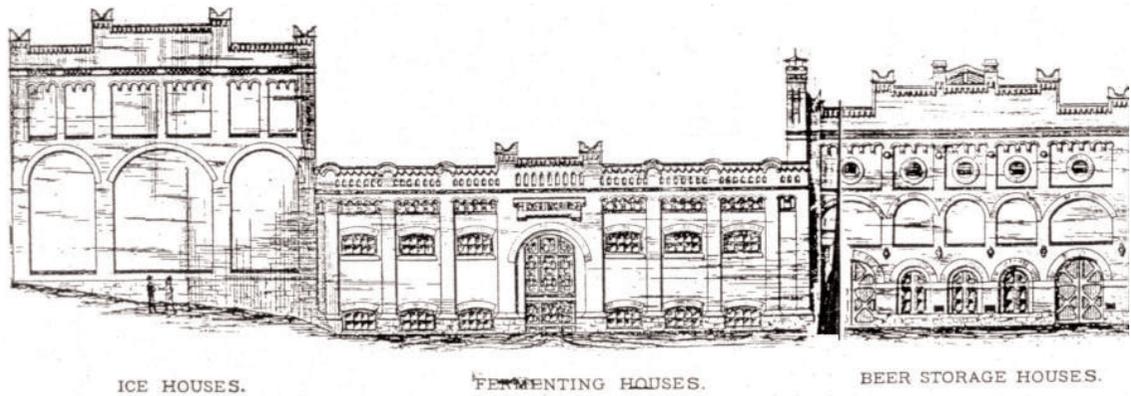


Figure 10. Edmund Jungenfeld, architect: Ice, Fermenting, Beer Storage Houses elevation, detail of Additions to Anheuser-Busch Brewing Association, St. Louis, 1879. Source: *The Western Brewer*. IV, 12, December 1879, unpagged foldout supplement.

[Fig. 10] at the left end of the overall group. All of these had few or only small exterior openings, a choice that helped keep inside the cold air that facilitated the functions in each. Instead of leaving the buildings' exteriors plain, however, Jungenfeld gave all of them decorative facades, featuring (instead of windows) varied arrangements of mostly 'blind' panel-like devices, often recessed slightly and segmentally or round-arched, sometimes with corbel arcading above, and with occasional small windows, including circular windows (oculi), these last perhaps with pivoting openings for ventilation. It is noteworthy that the Anheuser-Busch ice, fermenting, and beer storage (lagering) houses were moving aboveground, but here they were spread out horizontally, rather than being stacked vertically, as would shortly become typical of aboveground icehouses. In the more common aboveground icehouse developing in this period [Fig. 11], fermenting and aging facilities usually sat, in that order, below a top story that held an enormous amount of natural ice, the cold naturally descending to chill the lower chambers.

The contrast in Jungenfeld's design is apparent. Indeed, *The Western Brewer* observed that Jungenfeld's arrangement of these ice, fermenting, and lagering houses was 'a novelty in its way, the ice being laid upon one side, on a natural bank of earth, the cold air being drawn down into the rooms',<sup>50</sup> as seen in a section drawing [Fig. 12]. This unusual layout might be explained as a way to avoid the dripping of melting ice into fermentation vats, which were traditionally open-topped,

especially since, next door to the right, in the beer storage house, ice was stored directly above lager casks, which were traditionally closed-topped. While innovative, the layout here was not Jungenfeld's creation alone. Instead, his 1879 fermenting house used a cooling system patented by D.W.C. Sanford, with ice stored at the ends of the building, and cold air pumped through horizontal pipes in the first floor to the second floor, where warm air escaped through a pipe atop the ice body.<sup>51</sup> Nevertheless, the layout suggests the con-

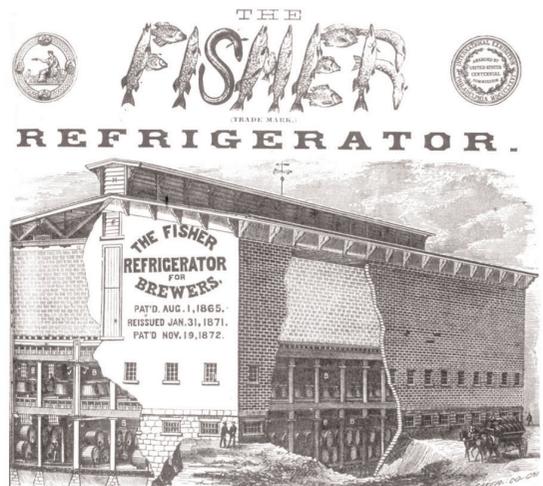


Figure 11. Fisher Refrigerator (Chicago), detail from an advertisement. Source: *The Western Brewer*. II, 4, April 1877, p.131.

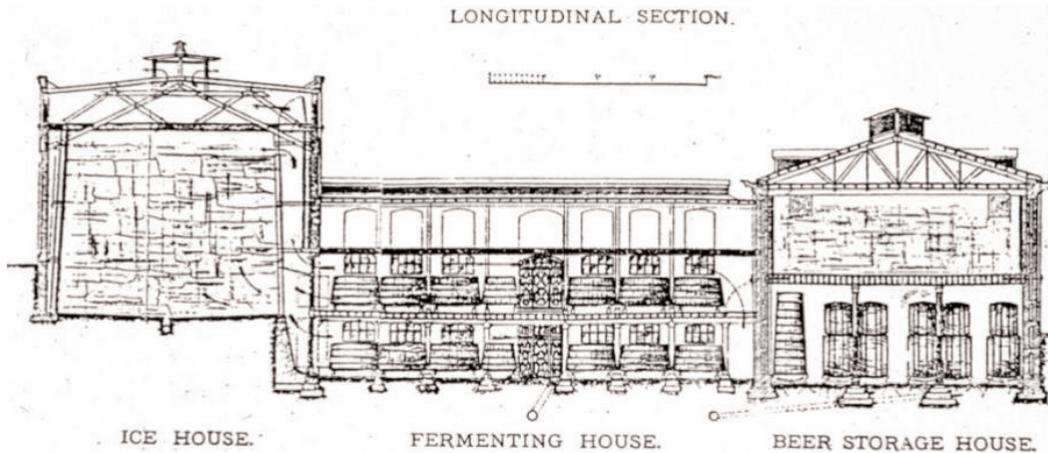


Figure 12. Edmund Jungenfled, architect: Ice, Fermenting, Beer Storage Houses, longitudinal section, detail of Additions to Anheuser-Busch Brewing Association, St. Louis, 1879. Source: *The Western Brewer*. IV, 12, December 1879, unpagged foldout supplement.

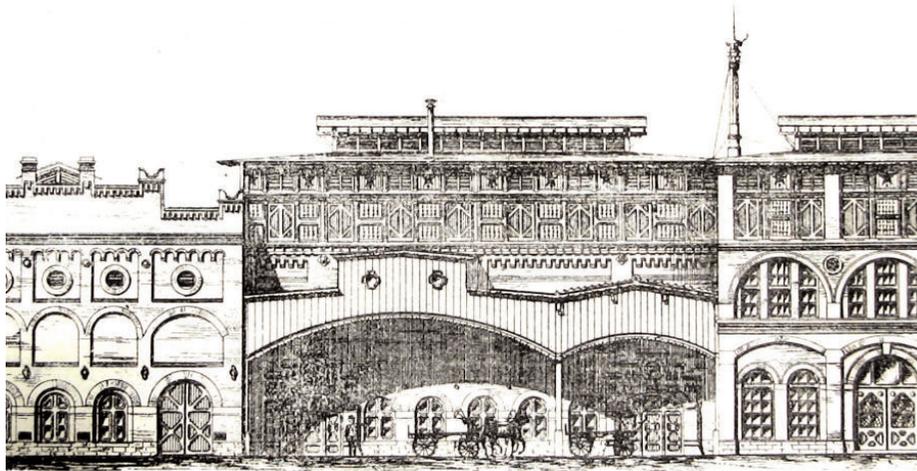
scious rethinking of earlier methods that led to variations on architectural forms, as it also shows Jungenfled's awareness of current developments in refrigeration.

Eventually, in the early to mid-1880s and beyond, the kinds of cooling concerns seen in Jungenfled's 1879 designs led him and many others to adopt entirely artificial, mechanical refrigeration, which also assured the brewing of lager year-round. But the path to fully mechanized refrigeration was gradual, marked by numbers of in-between kinds of architectural and cooling solutions. Various designers experimented with, even patented an array of above-ground ice house arrangements, as Figures 11 and 12 demonstrate. Overlapping these were tests of early refrigerating machinery, sometimes combined with natural ice and underground cellars, sometimes with aboveground ice houses. Cellars cooled with ice gradually gave way, however, as cooling machines became reliable on their own, without the expense or mess of natural ice. Out of this change came another building type within the brewery, the aboveground stock house, similar in form sometimes to the aboveground ice house, but designed for fermenting and aging lager entirely mechanically. That was still in the future in 1879, however, if coming soon.

Before jumping ahead, we should consider the rest of Jungenfled's 1879 additions at Anheuser-Busch. Picking up with the next building in Figure 9, the one to

the right of the beer storage houses was labeled the racking house [Fig. 13], but apparently served at least three purposes. In front it was an unwalled, tall-roofed, one-story space, where workers could move packages after beer was transferred into barrels and kegs within the actual racking house, which was recessed behind this porch-like area; the layout is clearer in the site plan, Figure 7. Perhaps it was from here that beer was also moved to the bottling house, or loaded on cars on the adjacent railroad tracks. The ice house mentioned in press coverage as above the racking house must only have risen above the rear section of this building, and the second story of its front wall was largely covered by the shipping area's tall roof, thus keeping it enclosed for the sake of the ice within. Notations on the drawings indicate that the uppermost (third) story of the racking house held a surface cooler that connected with the similarly designed top story of the machine house adjacent to the right.

That machine house was but one part of the new brew house of 1879 [Fig. 14], which differed in important ways from the structures just mentioned and from Jungenfled's own 1869 brew house, attached via an upper-story bridge at right. The differences indicate that the brew house was already taking on a new form that pointed in the general direction in which brew houses would develop through the 1880s and 1890s. In contrast to the 1869 design [Figs. 5, 14], and in spite of being



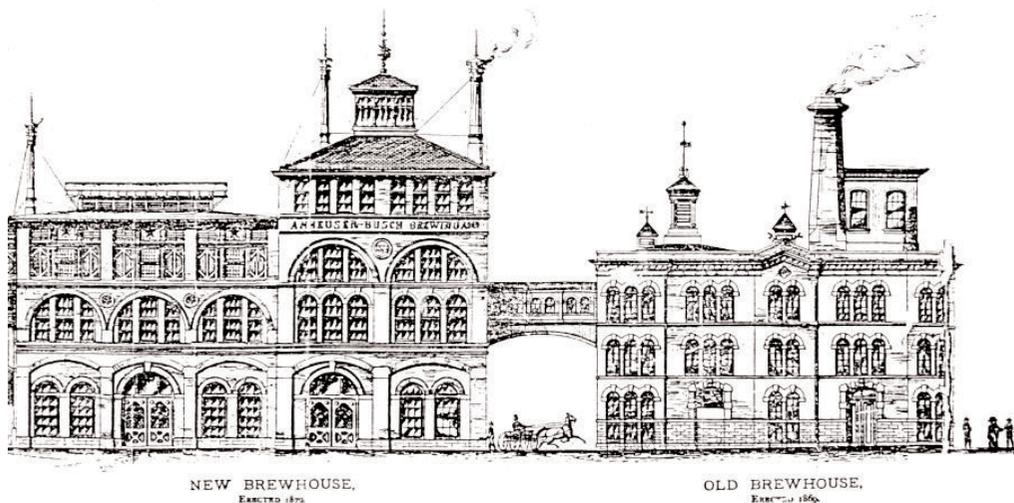
STORAGE HOUSES.

RACKING ROOMS.

Figure 13. Edmund Jungenfled, architect: Racking House, elevation, detail of Additions to Anheuser-Busch Brewing Association, St. Louis, 1879. Source: *The Western Brewer*. IV, 12, December 1879, unpagged fold-out supplement.

labeled simply ‘New Brewhouse’, the front elevation of the 1879 brew house was visibly designed as two distinct units. The lower, broader, three-bay, three-story machine house was set to the left, and the taller, narrower two-bay, apparently four-story brew house proper to

the right. The two sections were nevertheless closely related visually through various details, including continuous belt courses above the first and second stories (in American parlance; in British usage, above the ground and first stories). Wall openings in the two sec-



NEW BREWHOUSE.  
ERECTED 1879.

OLD BREWHOUSE.  
ERECTED 1869.

Figure 14. Edmund Jungenfled, architect: New (1879) and Old (1869) Brew Houses, elevation, detail of Additions to Anheuser-Busch Brewing Association, St. Louis, 1879. Source: *The Western Brewer*. IV, 12, December 1879, unpagged foldout supplement.

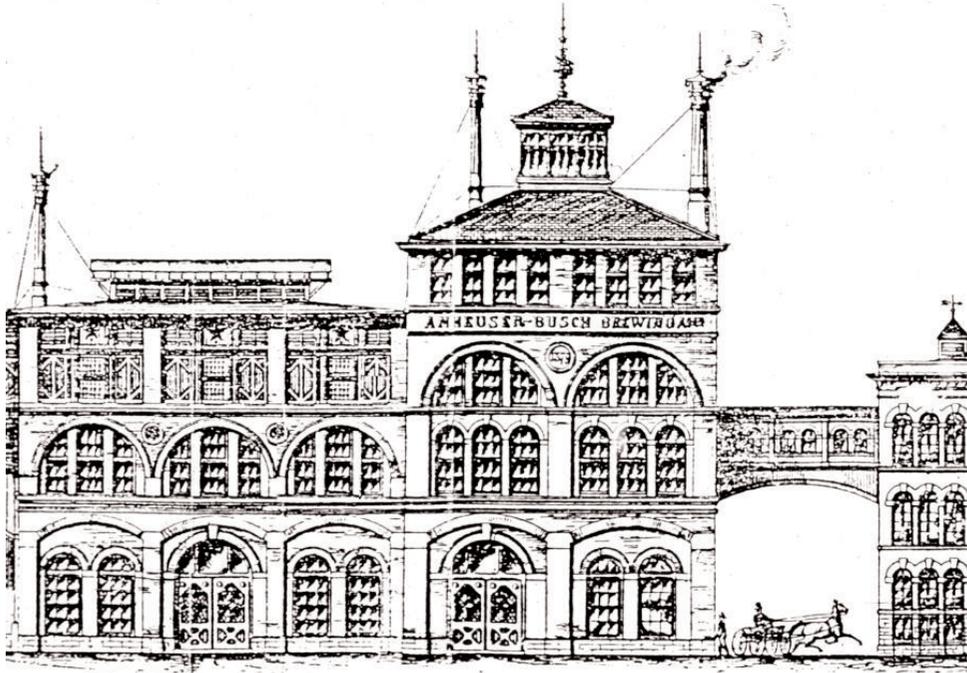


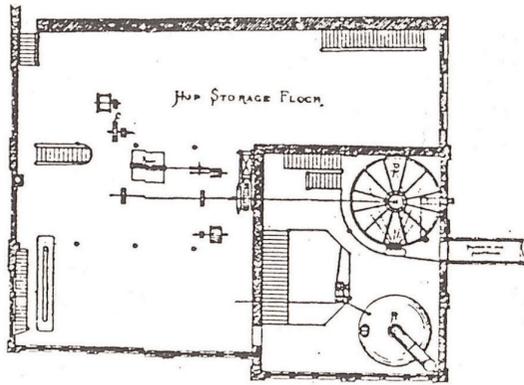
Figure 15. Edmund Jungenfeld, architect: New Brew House - Machine House (L) and Brew House proper (R), elevation, detail of Additions to Anheuser-Busch Brewing Association, St. Louis, 1879. Source: *The Western Brewer*. IV, 12, December 1879, unpaginated supplement.

tions were similar in form, but their arrangement shifted the balance between voids and solids that had been typical of the earlier *Rundbogenstil*. Now, both sections' walls were opened far more than in the earlier style, yet the buildings retained a sturdy, more assertive quality, as together, they were also rather larger than the 1869 brew house.

The two sections of the new brew house [Fig. 15] were designed to be similar, so, the machine house had a round-arched central double door at ground level, and the brew house proper had the same, but set off-center in the lower left bay. Windows on the ground stories of both sections were paired and transomed, round-headed, and double-hung, with 6/6 lights. Pairs of windows and the doors were set within slightly recessed, segmentally arched arcades springing across the ground story of each facade between shallow framing pilasters of a quite solid form. On the machine house facade, the middle story also had an arcade, but here of three broad, low-springing, round-arched bays, with transomed triple

windows tucked into each bay. Above, the machine house's uppermost story again had three bays, but with openings that were likely louvered, rather than glazed, reflecting the presence within of large, shallow surface coolers (that the Germans called *kühlschiffe*), in which the wort, recently boiled in the brew house proper, was cooled before being run to the fermenting house for the addition of yeast. Cooling of the wort was further facilitated by the raised, louvered penthouse or monitor that rose above the shallow-pitched roof to let more heat escape.<sup>52</sup>

Adjacent to the machine house was the façade of what I am calling the 'brew house proper'. Two bays wide, its first story (British ground story) had the double-door entrance identical to that of the machine house in the left bay, and a pair of transomed, round-arched, double-hung windows in the right. Both bays were shallowly arcaded and pilastered like the same story of the machine house, creating a strong sense of continuity between the two sections. On the second story (British



NEW BREW HOUSE.  
Second Story Plan.

Figure 16. Edmund Jungenfeld, architect: *New Brew House, Plan of Second Story, Additions to Anheuser-Busch Brewing Association, St. Louis, 1879.* Source: *The Western Brewer, IV, 12, December 1879, unpaginated supplement.*

first story) the two bays each had a set of triple round-arched windows framed by pilasters like those below, those triple windows seemingly capped on the next story up by broad, low-springing round arches with triple windows tucked in, much like those on the second story of the machine house, below and to the left. The higher placement of these large arches and the additional layer of triple windows below this third level helped give the brew house proper greater prominence over the machine house. This emphasis was furthered by a narrow horizontal band above, inscribed 'ANHEUSER-BUSCH BREWING ASSN.', and by an additional, shorter fourth story with a range of eight narrow rectangular windows set in two groups of four, just above the inscription and just below the roofline. Finally, the taller, more steeply pitched roof and the large, multi-windowed cupola made the brew house proper both taller than its machine-house component, and the tallest element among all of the 1879 buildings. Its height and especially its proportions also gave it a substantially more vertical and cubic emphasis than had been characteristic of the far more horizontal 1869 brew house.

Both exterior and interior revealed Jungenfeld's growing concern with making the brew house proper a center of attention, a focal point, a physical statement that, through its visual strength (along with the other buildings, certainly), facilitated, but also celebrated the bur-

geoning production levels of the Anheuser-Busch Brewing Association. The taller, more cubic proportions are borne out in scale notations within these drawings. These allow one to estimate that the 1879 brew house proper was about 40' wide by 37.5' deep, so nearly square in plan [Fig. 16], and at 36' high to the roofline (49+' to the top of the cupola), just off a full cube. The adjacent machine house was 53+' wide and L-shaped in plan, wrapping around behind the brew house proper. Together, the two sections stretched about 97.5' on the façade by 55' deep on the left and 60' deep on the right. These dimensions certainly outstripped Jungenfeld's 1869 building, which was 62+' wide by 30' deep and 26+' high to the roofline, and in which the brew house vessels were apparently housed only in the left third to half of the five-bay building (see site plan, Fig. 7).

Jungenfeld combined these various characteristics into a style that differed from the earlier *Rundbogenstil*, while retaining a dependence on the round-headed and segmental arches of the Romanesque Revival. Eventually, if not until into the 1880s and 90s, many architect-designed American breweries would tend toward a version of the 'Richardsonian Romanesque', a heavier, more robust variation on the lighter early Romanesque Revival that noted American architect Henry Hobson Richardson was creating in the 1870s and 80s.<sup>53</sup> This Richardsonian-influenced style is well demonstrated by a still later brew house for Anheuser-Busch [Fig. 17], finished in 1893 by the successors to Edmund Jungenfeld.<sup>54</sup> A similar style marked other 1880s-90s breweries as well, even where the brew house was not so independent, but one of a close grouping of components - not always the tallest, but generally recognizable from the relatively cubic form and the array of large ornamental windows [Fig. 18]. Jungenfeld's 1879 designs had not yet arrived at the later style, and some might suggest that they still had Italianate aspects, but I would argue that these buildings, particularly the brew house proper, were more muscular than the Italianate style generally. Thus, I see Jungenfeld's 1879 buildings at Anheuser-Busch as a step beyond the *Rundbogenstil* and leading toward the heavier Romanesque so often seen in somewhat later American brewery architecture. This forward-looking quality seems to me to underscore Jungenfeld's 'pioneer' status.

Mere exterior style, however, was not at all the whole story here. A longitudinal section of both machine house



*Figure 17. E. Jungenfeld & Co., architects: Brew House, Anheuser-Busch Brewing Association, St. Louis, Brew House, 1891-93. Source: Photograph by the author; March 1995.*

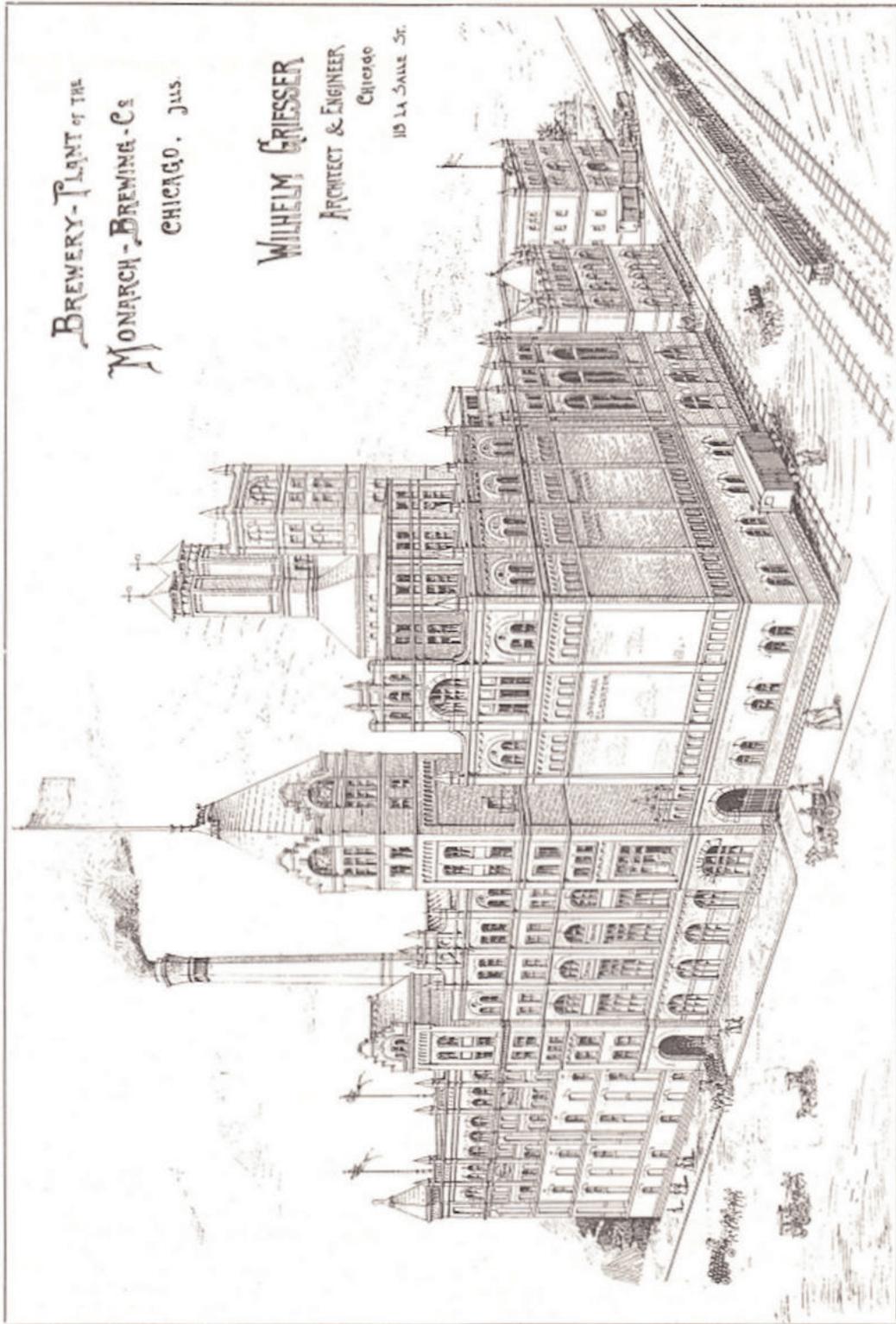


Figure 18. Wilhelm Griesser, architect: Monarch Brewing Co., Chicago, IL, 1892. Source: The Western Brewer. XVII, 3, March 1892, p.568.

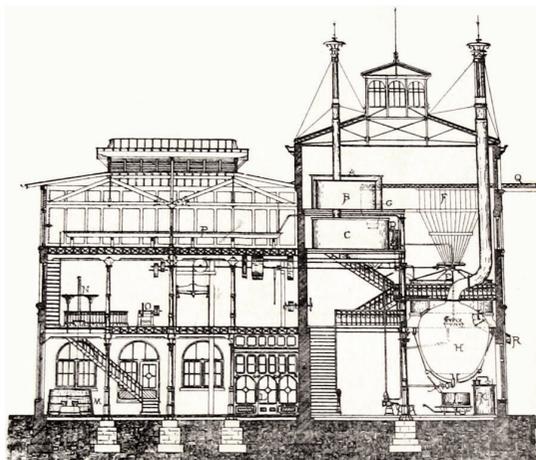


Figure 19. Edmund Jungenfeld, architect: *New Brew House, Longitudinal Section, detail of Additions to Anheuser-Busch Brewing Association, St. Louis, 1879.* Source: *The Western Brewer IV, 12, December 1879*: unpaginated supplement.

and brew house proper [Fig. 19] showed quite different interiors in the two components. The machine house had three distinct stories of similar height, as its façade suggested; the first (ground) story housed an engine room and a condensed water tank, with machinery and hop storage on second, and the surface coolers on third. Entirely differently, the interior of the brew house proper was not determined by its exterior, which suggested a four-story interior. Instead, the longitudinal section, augmented by a cross-section of the brew house proper [Fig. 20], showed the interior divided into varying partial levels by iron-framed and balustraded platforms that supported and gave access to specific equipment and that often took only part of the width of the interior space. These platforms were placed almost without regard to the exterior design, some extending from walls opposite to one another, but not meeting or at different levels, in order to allow brewing vessels to be arranged to facilitate a gravity-based flow of materials - water tanks and malt hopper near the top fed into the mash tub below, which then fed the still lower steam-jacketed kettle, then the hop back, etc.<sup>55</sup> Because the platforms did not extend the full width of the interior, the cupola above could illuminate the full height of the interior in the building's center. Between the cupola and the multiple windows in the exterior walls, the brew house proper was designed to have a sense of light-filled ver-

ticality, while also allowing for plenty of ventilation in a structure where the heat of the cooking processes made for very different conditions and needs than those of fermenting or lagering houses.

The new facilities upped production capacity substantially. Anheuser-Busch's sales for 1880 reached 131,000 barrels, and its sales of bottled beer more than doubled between 1875-76 and 1879-80.<sup>56</sup> On the other hand, the 1879 facilities made clear that Adolphus Busch and Edmund Jungenfeld were still using natural ice for cooling the fermenting and storage houses. That would change within only two to three years, again demonstrating the forward thinking of both brewer and architect.

Even as Jungenfeld was providing for the growth of Anheuser-Busch in the later 1870s, he had also been exploring newer means of cooling lagering facilities. This interest led him, in the fall of 1878, into a rather unusual and somewhat long-distance partnership with another early brewery architect/engineer, Theodore

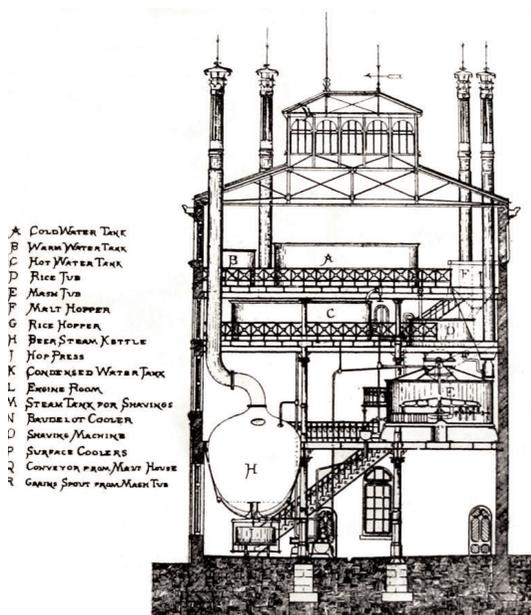


Figure 20. Edmund Jungenfeld, architect: *New Brew House (Brew House proper), Cross Section, detail of Additions to Anheuser-Busch Brewing Association, St. Louis, 1879.* Source: *The Western Brewer IV, 12, December 1879*, unpaginated supplement.



Figure 21. Portrait of Theodore Krausch, architect, Chicago, 1885. Source: *The Western Brewer*. X, 11, November 1885, unpaginated supplement.

Krausch [Fig. 21]. Krausch had first appeared in Philadelphia, then New York City, advertising himself as early as 1869 primarily as an engineer and machinist specializing in equipment for breweries, malt and ice houses.<sup>57</sup> His later ads, repeated often, included (with various devices he had invented) a cutaway drawing of his version of an aboveground ice house arrangement [Fig. 22], where, as was by then becoming typical, a massive amount of ice on the uppermost level provided sufficient cold for the fermenting and lagering of beer on the lower stories.<sup>58</sup> Within a few years, he pushed farther and combined such an ice house with an early ice machine, first successfully installing such a system in Albert Ziegele's brewery in Buffalo, NY in April 1877.<sup>59</sup> Krausch's efforts paralleled others' experiments with mechanically driven refrigeration, as they moved, little by little, toward the goal of fully artificial refrigeration.

Buoyed by this success, Krausch spent the summer and fall of 1877 supervising construction of a 'model' brewery for Michael Brand, Chicago. Apparently, Krausch

decided that there was work to be had in the Midwest, and before the end of 1877, he was reported to have 'recently settled in Chicago and opened an office at 65 Exchange Building'.<sup>50</sup> From there he contracted with W.J. Lemp's Western Brewery, St. Louis, to provide refrigeration for what was then the largest brewer in St. Louis.<sup>61</sup> It may have been through the work for Lemp that Theodor Krausch came into contact with Edmund Jungenfeld. Regardless of how they met, Krausch announced in November 1878 that he had associated himself with Jungenfeld, 'also an expert engineer in the same line', in a new operation to be called 'Theo. Krausch & Co.', or the 'Constructing Office of Theo. Krausch & Co.'. Their first ad [Fig. 23] appeared that month, filling a full page in *The Western Brewer* and already listing a remarkable array of projects, most of which must have been previously begun or only in the planning stage. They claimed to be installing their systems of refrigeration and ventilation, and building ice storage houses and refrigerating houses for dozens of breweries scattered from New York and Philadelphia to Buffalo, Chicago, Detroit, Milwaukee, and St. Louis, among many other locations.<sup>62</sup> In pledging to 'Design, Arrange and Construct Breweries, Malt Houses, Ice Houses, Grain Elevators, Etc., and their Entire Machinery', Theo. Krausch & Co. offered a full-service approach that marks an important point in the transition

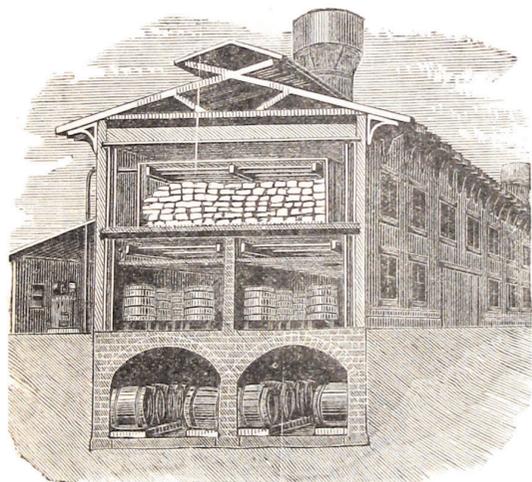


Figure 22. Theodore Krausch, architect: Combination Ice Cooling & Mechanical Refrigeration Plant, 1877, detail of an advertisement. Source: *The Western Brewer*. II, 6, June 1877, p. 219.



from the early vernacular breweries of the past and the modern, professionally designed breweries of the future.

Together and/or separately, Krausch and Jungenfeld began to have a notable presence in the brewing industry, as seen in their coverage by industry journals. Sometimes projects developed by one of them would be publicized as that man's design alone, so that most of the St. Louis projects appear to have been primarily Jungenfeld's, while those in Chicago, Milwaukee, and farther east appear to have been Krausch's. Sometimes it is unclear which partner was in charge. Their business was managed by Joseph Koenigsberg, whose name was featured with the architects' names in their ads, although how Koenigsberg handled things and to what degree remains hazy. In spite of the appearance of prosperity conveyed in their ads, however, the team did not last. In April 1880, *The Western Brewer* reported that, 'Mr. Theodore Krausch has withdrawn from the firm of E. Jungenfeld & Co., St. Louis ...'<sup>63</sup> Regardless, the association of Jungenfeld with Krausch gave the St. Louis architect valuable experience and recognition in the rapidly developing field of artificial refrigeration.

In following years, legal judgments with money damages were settled against Koenigsberg (1880), then Krausch (1881, 1882), and in favor of Jungenfeld in the Circuit Court of St. Louis.<sup>64</sup> The legal contentions among these three men may have resulted from the demise of Theo. Krausch & Co., but they may also have had to do with further development of reliable mechanical refrigeration machines.<sup>65</sup> The judgment against Koenigsberg involved a 'stay of invention', and settlement eventually included an exchange of shares in the Empire Refrigerating Company. While no explanation for the Krausch judgment has been tracked down, the period of the early 1880s was one in which the suppliers of any number of major refrigeration machines, most of them now using chilled brine circulating through extensive piping systems, were competing intensely within the brewing industry. Several brewery architects secured rights to various patented refrigeration machines and systems, allowing them to reap the benefits of being able to supply directly this increasingly important technology.

Again, Edmund Jungenfeld was caught up in the excitement surrounding an important technological

advance.<sup>66</sup> He helped to found the Empire Refrigerating Company of St. Louis, 'operating Chas. G. Mayer's Patents, incorporated in June 1882, for the sale and construction of "The Perfect System of Brine Circulation"',<sup>67</sup> but had clearly been involved earlier. The background provided in this announcement of incorporation rather conflated Jungenfeld's with Krausch's achievement at Ziegele's Buffalo, NY, brewery in 1877, presumably to demonstrate Jungenfeld's early involvement in refrigeration innovation. And, given Jungenfeld's previous relationship with Krausch, Jungenfeld must have been part of the period of experimentation described in the announcement as coming in the wake of the Ziegele event. Thus, E. Jungenfeld & Co./Empire Refrigeration Co. claimed that:

Several similar machines were erected in different places until in the summer of 1880, they executed a contract for S. Luscher, Frankfort, Ky., when they selected the method of circulation of brine through pipes. Since then the advantages of artificial refrigeration having been clearly demonstrated and become one of the essentials of the manufacturing interest, they have concluded to disconnect the refrigerating business from their other business of Brewers' Architects and Engineers, and under the patents obtained on their system of circulation ...<sup>68</sup>

In their ad in the July 1882 *Western Brewer* [Fig. 24], the upper half of the page focused on E. Jungenfeld & Co., Brewers' Architects and Engineers, 919 Olive St., St. Louis, while the lower half drew attention to 'The Empire Refrigerating Company, Patentees and Manufacturers of Refrigerating Machinery', at the same address. The officers of the latter were listed as E. Jungenfeld, President and Treasurer; C.G. Mayer (whose patents were the basis of the Empire machine), Vice-President and Superintendent; and J. Koenigsberg, Secretary, this last suggesting that Koenigsberg and Jungenfeld had mended their earlier rift.<sup>69</sup> In addition, a list of 18 references for the Empire machine included clients in Buffalo, Brooklyn, and New York City, NY; Fort Worth and Waco, TX; Lancaster, OH; Frankfort, KY; Memphis, TN; Kansas City and Jefferson City, MO, along with seven firms in St. Louis and its immediate vicinity. The clear implication here is that Jungenfeld's involvement with the Empire machine had been developing over some time, not just springing into existence in mid-1882. About two years after this

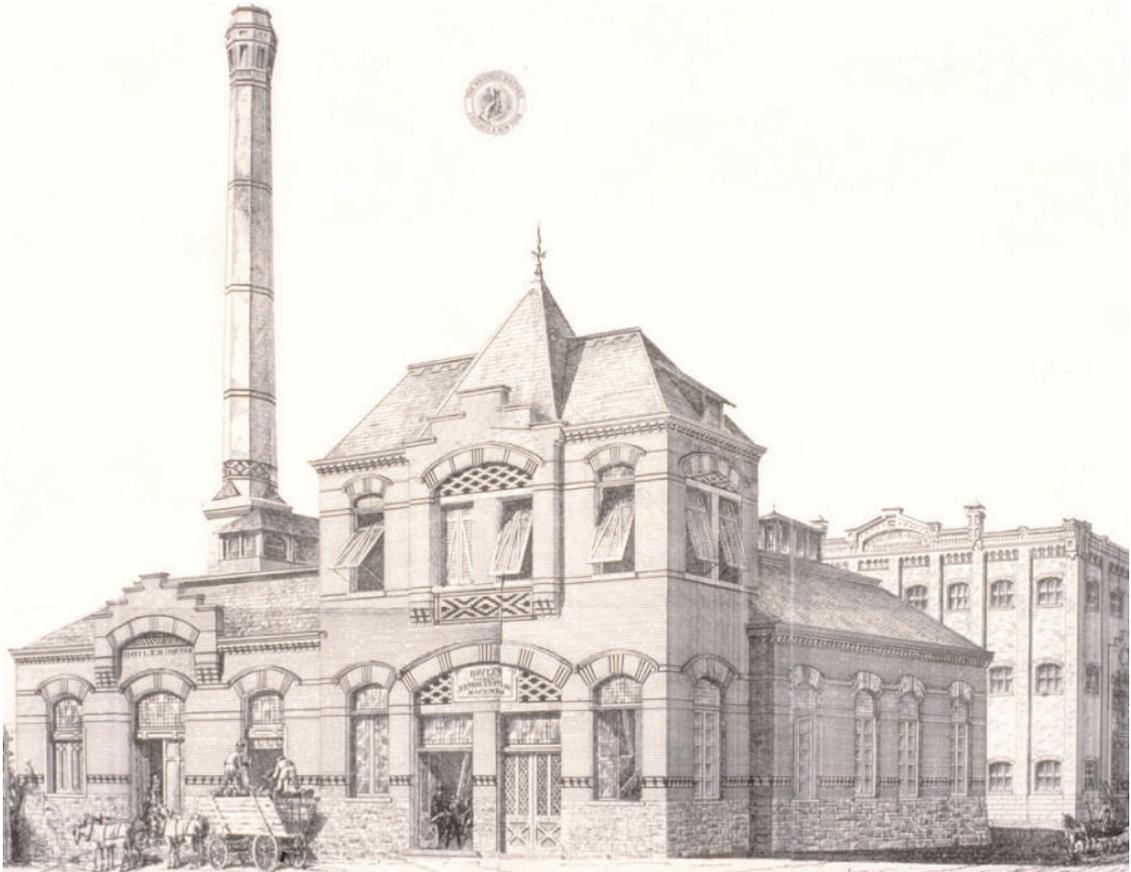


Figure 25. Edmund Jungenfeld, architect: Refrigerating Machine House, exterior, for Anheuser-Busch Brewing Association, St. Louis, 1882. Source: *The Western Brewer*. VII, 1, January 1882, unpagged supplement.

announcement the Empire Refrigerating Co. merged with the Boyle Ice Machine Co. of Chicago, the new firm to be called the Consolidated Ice Machine Co.<sup>70</sup>

Not surprisingly, the Anheuser-Busch Brewing Association appeared among the St. Louis clients of Jungenfeld/Empire in that 1882 ad, which takes us back to that important and still growing St. Louis brewery. Adolphus Busch had been hesitant to invest in artificial refrigeration before 1880, largely because he had easy access to ice from the Mississippi River, and because he had already spent large sums to have ice storage facilities built in Hannibal, MO, and Quincy, IL, along with various ice depots in the south and west.<sup>71</sup> Still, the reliable artificial refrigeration machine offered an important temptation - the possibility of brewing year-

round, without reliance on the whims of nature and the limitations of underground vaults and natural ice.

Nevertheless, in October 1880, Edmund Jungenfeld was reported to be increasing the size of Anheuser-Busch's large ice house, presumably the one the architect had built only the year before, to increase lager storage capacity to 90,000 barrels.<sup>72</sup> Continuing the established pattern, Jungenfeld also planned ice-storage houses for Anheuser-Busch at Springfield and Seligman, MO by March 1881.<sup>73</sup> Then, rather suddenly, in September 1881, Anheuser-Busch contracted with the Boyle Ice Machine Company of Chicago for apparatus to cool the entire brewery, which was to be installed as soon as it could be constructed.<sup>74</sup> While this was hardly the first time a brewery had ordered an ice machine, the St.

Louis firm did so only after Adolphus Busch spent years studying various refrigeration machines in Europe and the United States, finally determining that Boyle machines would best suit his current needs. Dramatically, Busch determined to convert the entire plant to artificial refrigeration all at once. As *The Western Brewer* said in April 1883:

It took a brave man, guided by intelligence, to make such a change; to leave the safe and sure old plan, tear out all means of refrigerating by ice, turning the ice houses into storage and fermenting cellars, and relying entirely upon the Boyle Refrigerating Machines. Half a million dollars' worth of beer in store, and the more valuable good name of the Anheuser-Busch beer, depended on the decision. As it took 40,000 tons of ice annually to supply the wants of the brewery, therefore to take its place by machinery, required the construction of apparatus of greater capacity than was then in existence anywhere ... In April, 1882, the whole work was finished and in successful operation ...<sup>75</sup>

Busch's decision and Jungenfeld's recent experiences with new refrigeration machines must have influenced strongly Jungenfeld's developing interest in the Empire Company so soon after.

The spectacular new equipment for Anheuser-Busch required housing, of course, and so Adolphus Busch put Edmund Jungenfeld to work yet again, designing a combined boiler house and refrigerating machine house [Fig. 25] to facilitate 'the largest and most complete job of refrigerating in a brewery that was ever attempted in the world'.<sup>76</sup> Since Ph. Best (later Pabst) in Milwaukee was doing much the same thing at the same time,<sup>77</sup> that statement may have been aggrandizing, but the new building at Anheuser-Busch provided yet another specialized architectural element to the brewery's makeup. Here, the new building stood independent of others, set at right angles to and across railroad tracks from the 1879 brew house. Its exterior design was handsome and ornamental, as its interior was functionally practical.

The building was essentially a single story to begin with, the boiler house at left housing two batteries of two boilers each [Fig. 26], with a fine smokestack at the rear corner. The refrigeration machine house at right had a second story, but only in the front portion, designed to allow the condensers to be placed on the upper level and to ventilate them via pivoting windows. Within the rear

of the space were the three mammoth (for the day) 50-ton Boyle refrigerating machines [Fig. 27],<sup>78</sup> along with refrigerating tanks and cold brine circulating pumps. One of these big vertical machines cooled four brewings per day of 300 barrels each via a large Baudelot cooler (now replacing the old surface coolers), while the other two machines connected to a system of cooling pipes along the ceilings of the fermenting and storage cellars (still called 'cellars', even when aboveground). Although highly functional, this building was also fin-

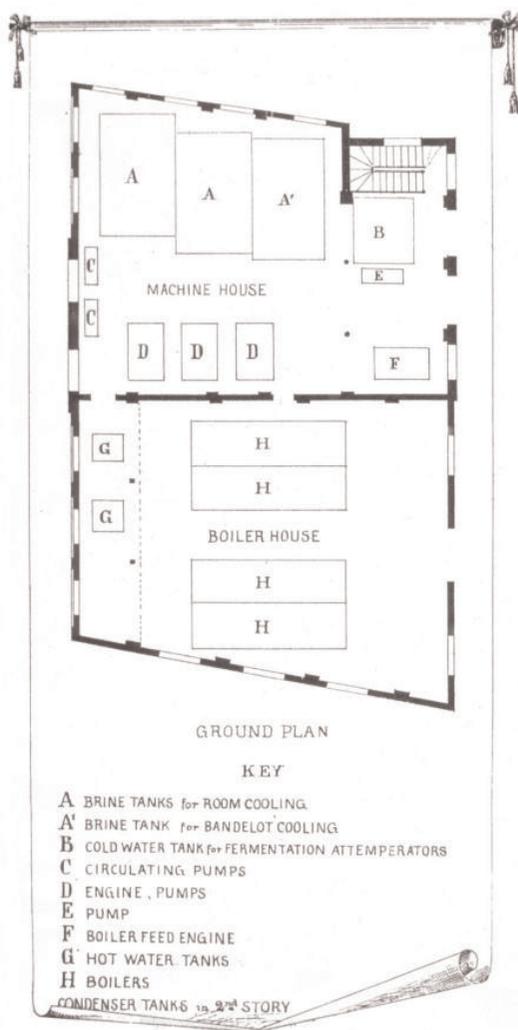


Figure 26. Edmund Jungenfeld, architect: *Refrigerating Machine House, plan, for Anheuser-Busch Brewing Association, St. Louis, 1882.* Source: *The Western Brewer*. VII, 1, January 1882, unpagged supplement.

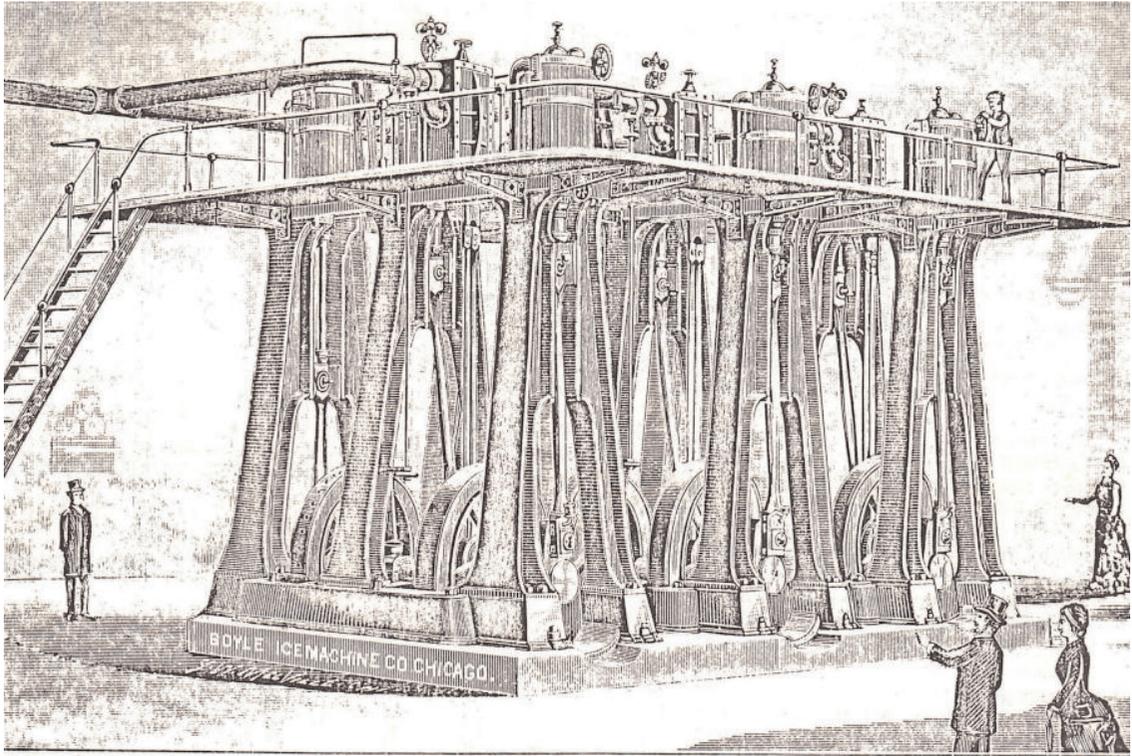


Figure 27. Three 50-Ton Boyle Refrigeration Machines in Edmund Jungenfeld's Refrigerating Machine House, exterior; for Anheuser-Busch Brewing Association, St. Louis, 1882. Source: *The Western Brewer*. VIII, 4, April 1883, p.643.

ished in an elaborate manner. The exterior was handsome, substantial, and decorative in details, while in the interior:

The machines are finely finished in nickel plate, brass and polished steel, the tanks are encased in polished oak, and everything bears the stamp of perfection in every detail of efficiency as well as art; the whole forming the most perfect and magnificent specimen of this class of machinery in the world.<sup>79</sup>

Such care and concern for appearance were warranted, given that the huge machines quickly became an attraction for visitors to the brewery, as Figure 27 suggests.

These Boyle machines were only the first of many more refrigeration machines that Anheuser-Busch would install periodically into the early 1890s to keep up with its still-growing production. By 1884, when sales had jumped to 500,000 barrels of beer,<sup>80</sup> the company had

seven ice machines; then, in that year, Busch brought in a large De La Vergne machine made in New York City. Jungenfeld's 1882 ice machine house was far too small already, yet, between 1884 and 1891, in the period just after Jungenfeld's passing, Anheuser-Busch bought eight more machines, four of them installed in a new machine house on Arsenal Street in St. Louis, and one smaller one each at new branches of the brewery in Kansas City, MO; Dallas and Sherman, TX; and Brooklyn, NY.<sup>81</sup> In early 1893, a whole new refrigerating plant at the northwest corner of Ninth and Arsenal Streets was the focus of an article that reported on the Anheuser-Busch cooling equipment, now designed by Jungenfeld's successors. With a 500-ton De La Vergne machine, three 220-ton De La Vergnes, one 100-ton Empire, and three 50-ton Boyles, the plant had increased its total refrigerating capacity to 1,410 tons per day. The sheer fascination with the biggest of these machines [Fig. 28] is clear, not only in *The Western Brewer's* detailed discussion of its dimensions, materi-

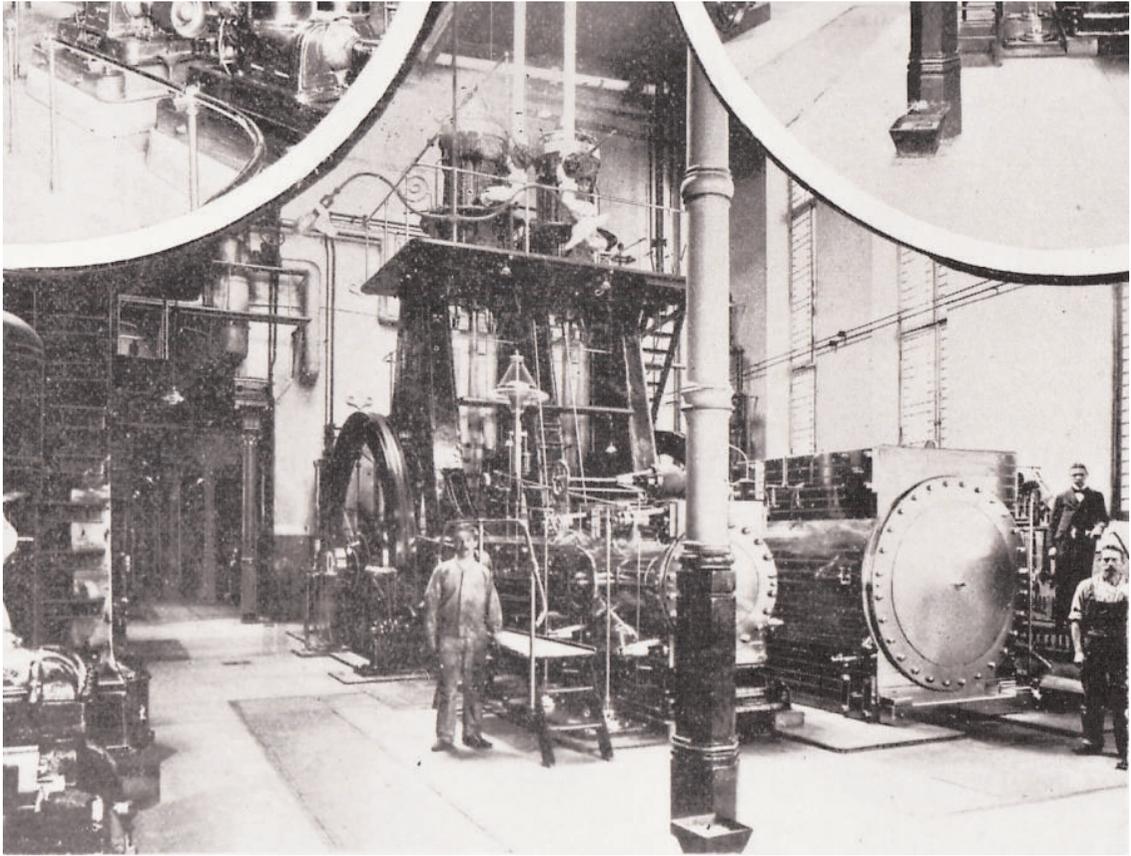


Figure 28. 500-ton De La Vergne Refrigerating Machine, 1 of 3 views of the Interior of the 1893 Refrigerating Machine House for Anheuser-Busch Brewing Association, St. Louis. Source: E. Jungenfeld and Co. (1895) Portfolio of Breweries and Kindred Plants Designed and Erected by E. Jungenfeld & Co., St. Louis. St. Louis, n.p.

als, and weight, but also in this single sentence: ‘The great De La Vergne machine is the largest refrigerating machine in the world, having been built especially for this order, and is the wonder and admiration of all who see it’.<sup>82</sup> It would be natural to assume that adding and altering buildings to house these machines and facilitate the ever-increasing production levels must have brought substantial variations to the plan Edmund Jungenfeld had developed for Anheuser-Busch. His successors, however, continued to work on the same basic principles and organizational scheme Jungenfeld had laid out before his death. An 1889 article described even new buildings as part of a group, ‘all so constructed, so connected, and so designed as a part of a grand architectural system, that the effect of the picture which they present is as of an immense single structure’.<sup>83</sup>

After 1884, however, Edmund Jungenfeld was no longer present to guide Anheuser-Busch’s expansion, or to give form to any other clients’ facilities. His business that year was booming, and in May 1884, he was lauded as ‘a gentleman largely known in the trade, for the many monuments of his art and skill scattered over the country’.<sup>84</sup> By October, his Empire Refrigerating Co. had merged successfully with the Boyle Ice Machine Co., and the new firm, Consolidated Ice Machine Co. claimed 33 clients and ‘a larger cash capital than any other manufacturer of similar machinery employs ...’<sup>85</sup> Also in October, however, Jungenfeld took ill and on 20 December, at the still-young age of 44, he was dead. The sense of loss felt by many was apparent in the obituary for him in the January 1885 issue of *The Western Brewer*, along with some insight into

Jungenfeld's character. The obituary writer stated that, not long before (presumably in the earlier autumn), he had visited Jungenfeld, finding him

apparently in vigorous health, with the ever-active and restless brain which so characterized him doing its usual work ... He was happy and cheerful as ever, proud of his success, and still reaching out his hands towards new endeavors.<sup>86</sup>

The obituary went on to note that the entire St. Louis brewing industry was represented at Jungenfeld's funeral, and to state that,

No man better understood the needs of brewers architecturally, or the building and laying out of brewery plant, and in this respect he has left many monuments of his skill and judgment that will carry his name to posterity. There are few men living capable of taking the place he occupied in our trade.<sup>87</sup>

Regardless, Jungenfeld's architectural firm would go on,

to be continued by Messrs. Robert W. Walsh, Fredk. Widmann and C.D. Boisselier, each of whom has been in his employ for many years past, and were selected by him as his successors, under the name of E. Jungenfeld & Co.<sup>88</sup>

This sense of succession brings up an important point about Jungenfeld and others of the 'pioneer generation' of brewery architects: their offices were training grounds that gave rise to the next generation of specialists in brewery design and related fields. Because of his early death, Edmund Jungenfeld had rather less time to mentor younger designers than, say, Fred W. Wolf in Chicago, who lived until 1912. Still, Jungenfeld was an important source of expertise and inspiration, and the work he produced served to exemplify what an architect could bring and had brought to the creation of a modern, updated, increasingly mechanized brewery.

Without doubt, Edmund Jungenfeld's most significant client was Adolphus Busch, thus, the Anheuser-Busch Brewing Association. But to suggest, as this essay has so far, that Jungenfeld worked exclusively for that firm would be a great error. While he continually contributed to the expansion of Anheuser-Busch, Jungenfeld was also working for a great many other clients. Nearly 50 have been identified, at least by name and location, and they ranged geographically from New York City,

Brooklyn, and Philadelphia in the East, to San Francisco in the far West. Often, he worked for clients multiple times, as smaller breweries grew larger. Most were in the Midwest, including Missouri, Nebraska, Illinois, Ohio, and Kentucky, and in St. Louis itself, Jungenfeld counted 14 breweries, two malting firms, a major chemical works, and a wine company among his clients.<sup>89</sup> Sometimes little or nothing is known about specific projects, sometimes Jungenfeld provided mechanical equipment and/or refrigerating machines (via the Empire Refrigerating Co.), sometimes he built only an ice house, but sometimes he designed major components or entire breweries; occasionally, he also designed residences and commercial structures. With this kind of business building up, it may not come as a surprise that, as early as 1879, *The Western Brewer* said of Jungenfeld that,

we deem it our duty to speak of the man under whose advice and direction the entire [Anheuser-Busch] brewery has been constructed, Mr. E. Jungenfeld, of St. Louis ... Mr. Jungenfeld enjoys to an unlimited extent the confidence of the trade in St. Louis, and his success in brewery building has been so marked that his orders from abroad are now numerous.<sup>90</sup>

No one architect/engineer could have handled that much work single-handedly in the course of the 15 years (1869-1884) of Jungenfeld's career in the brewing industry. The size of his office staff is difficult to know for certain, although some employees' names appeared in Jungenfeld's Probate records. These and various other records did note that he was ably assisted by Frederick Widmann (from 1878), Robert W. Walsh (from before 1878), and Caspar D. Boisselier (from c.1877), all of them presumably having met in the firm of Walsh & Jungenfeld, then working together with E. Jungenfeld & Co. until Jungenfeld's sudden death in 1884.<sup>91</sup> As noted earlier, these three chief assistants would take over the firm of E. Jungenfeld & Co. following their employer's demise, running the firm very successfully under the same name for many years. Their experience and that of other younger men, gained in working with Jungenfeld, led several to careers that reflected how potent a training ground Jungenfeld's office was for the next generation of brewery architects.

One of these, Otto J. Wilhelmi [Fig. 29], appeared as early as 1873. Born in St. Louis in 1853,<sup>92</sup> Wilhelmi was working as a draughtsman for Walsh, Smith &



Figure 29. Portrait of Otto J. Wilhelmi, architect, St. Louis. Source: <http://www.findagrave.com/cgi-bin/fg.cgi?page=gr&GRid=76496951> (accessed 2 August 2013). Courtesy of Valerie Phillips Gildehaus.

Jungenfeld at the age of 20. He later completed his architectural training at Karlsruhe Polytechnic in Germany in 1878-79.<sup>93</sup> One wonders whether Jungenfeld perhaps encouraged Wilhelmi to seek out a formal education similar to his mentor's before launching his own career. On returning to St. Louis, Wilhelmi became the partner of Ernst Janssen, another noted St. Louis architect, between 1879 and 1881;<sup>94</sup> among their clients in 1881 was the Klausmann Brewing Co., St. Louis.<sup>95</sup> On his own after 1881, Wilhelmi worked for the Cherokee Brewery, St. Louis, in 1882,<sup>96</sup> and later branched out internationally to design the Cerveceria Cuauhtemoc, Monterey, Mexico, in 1891 [Fig. 30].<sup>97</sup> Admittedly, Wilhelmi became more famous for designing schools, theatres, and 'grand residential structures for wealthy German clients'<sup>98</sup> than for breweries, but one of these residences was his 1907 house for C. Marquard Forster, former head of the Hyde Park Brewery, St. Louis.<sup>99</sup> Wilhelmi died in 1925.<sup>100</sup>

Much more dedicated to the architecture of breweries was Wilhelm Griesser [Fig.31], who also started his career as an assistant in the office of E. Jungenfeld & Co. An 1891 biographical sketch stated that he had by then been established in Chicago for about seven years (so, beginning shortly after Jungenfeld's death in late 1884),

rapidly building up a widespread and permanent patronage, though his reputation as an able and skillful brewery engineer and architect had preceded him in his coming here to reside continuously in Chicago.<sup>101</sup>

Born in Germany about 1854, Griesser came to the U.S. about 1881, first spending three years in St. Louis, 'where he was extensively employed in improving breweries and in planning and superintending the erection of others'.<sup>102</sup> His employment was most likely with Jungenfeld, although it is not clear just when he began in that office. Griesser was definitely employed there at the time of Jungenfeld's death, since a record in Jungenfeld's Probate file indicates that Griesser had spent at least the months of November and December, 1884 in Chicago, supervising work for Jungenfeld at the Schoenhofen Brewing Co. there.<sup>103</sup> Likely, it was that

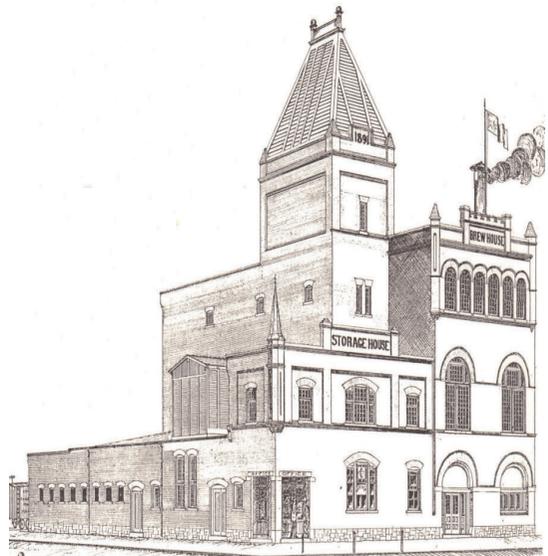


Figure 30. Otto J. Wilhelmi, architect: Cerveceria Cuauhtemoc, Monterey, Mexico, 1891. Source: *The Western Brewer*. XVI, 12, December 1891, p.2838.



Figure 31. Portrait of Wilhelm Griesser, architect, Chicago, 1893. Source: Smith, F.H. (comp.) (c.1893) Art, History, Midway Plaisance and World's Columbian Exposition. Chicago: Foster Press, n.p.

experience in Chicago that led Griesser to open his own office there, for which the first advertisement in *The Western Brewer* appeared in March 1885. Significantly, for some time his ads included the notation, 'Formerly with E. Jungenfeld, St. Louis'.<sup>104</sup> By November 1885 Griesser had secured a commission to design and supervise construction of a brewery for the newly established Keystone Brewing Co., Pittsburgh, PA. Not surprisingly, in light of the innovations of Edmund Jungenfeld, Griesser drew attention to his newly designed brewery's being equipped 'with a somewhat novel arrangement of the various departments'; it would also use natural gas-heated boilers.<sup>105</sup>

In September 1886 Griesser's ads began to incorporate illustrations of various of his inventions, in addition to noting his architectural and engineering skills.<sup>106</sup> In the same month, *The Western Brewer* featured his 'Model Lager Beer Brewery' [Fig. 32], designed for production of 200,000 barrels per year. Rather wistfully inscribed *Brewery L'Esperance* ('the brewery of hope' or 'a hoped-for brewery'), it seems the architect's attempt to gain some attention in an increasingly competitive market. The journal's discussion of Griesser's design noted that it was intended to be

built in sections, one part at a time complete in itself, so that a small but growing concern can start with little capital, and increase their plant as occasion demands, thus in the end having an imposing building erected on a perfect plan as a whole.

The complete model brewery would cover 240 x 300' and include the brewery proper, a malt house and elevator, a stock house, and stables. Editorializing a bit, the journal stated that,

Had some of the larger establishments started out in this way years ago, instead of having to-day a great number of disjointed and illy [sic] arranged buildings, they would have gradually developed a great brewery in which they could have taken pride.<sup>107</sup>

Such a comment suggested strongly that a well-planned, attractive brewery was becoming the ideal, and one is tempted to see this concern for a coherent, overall plan, achievable as needs and means became available, as having some of its roots in Griesser's experience with Edmund Jungenfeld and Jungenfeld's with Anheuser-Busch.

Perhaps the publicity helped, because Griesser's career began to pick up, so that in late 1886 and 1887 he claimed to be working on improvements to established breweries, as well as new facilities for several newly founded breweries in Chicago and environs, in Pittsburgh, and for a Kentucky maltster. By April, he announced that he had formed a partnership with August Maritzen, 'formerly with F.W. Wolf, and late with Baumann & Lotz, Chicago', all of them brewery architects/engineers. The new firm was to be known as Griesser & Maritzen and headquartered in Chicago.<sup>108</sup> Stressing Maritzen's connection with Fred. W. Wolf, another of Widmann's pioneer brewery architects, was a means of giving the younger man credibility, as had Griesser's stress on his own background with Jungenfeld. Although this partnership lasted only until 1 November 1890,<sup>109</sup> Griesser & Maritzen's impressive work, often for Chicago and other Midwestern breweries, also extended to Buffalo, NY; Dallas and Fort Worth, TX [Fig. 33]; even Los Angeles, CA. Both of the partners in Griesser & Maritzen were thus established as brewery designers of significance, each of whom would keep designing on his own after their partnership ended.<sup>110</sup>

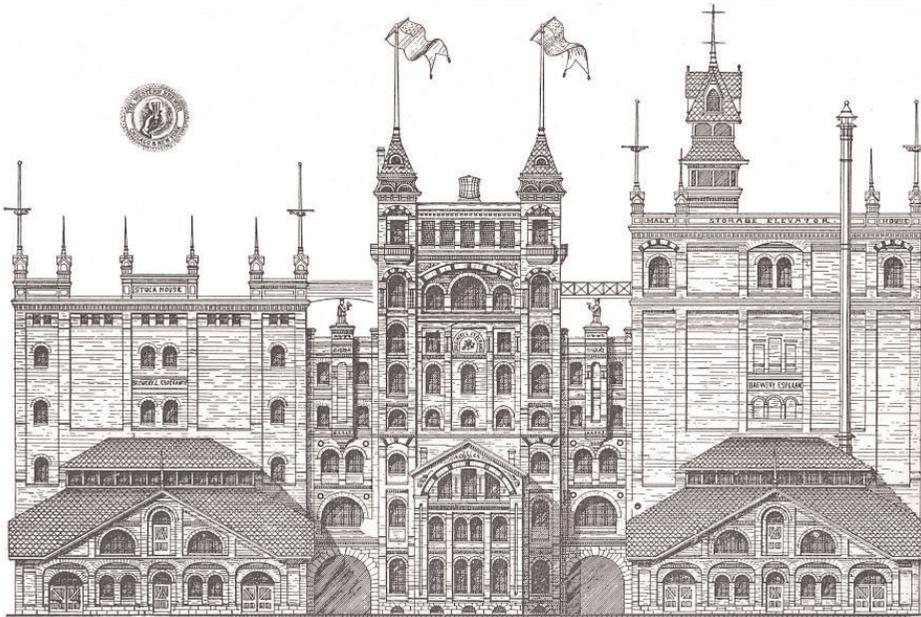


Figure 32. Wilhelm Griesser, architect: Model Brewery (Brewery L' Esperance), 1886. Source: The Western Brewer. XI, 9, September 1886, unpagged supplement.

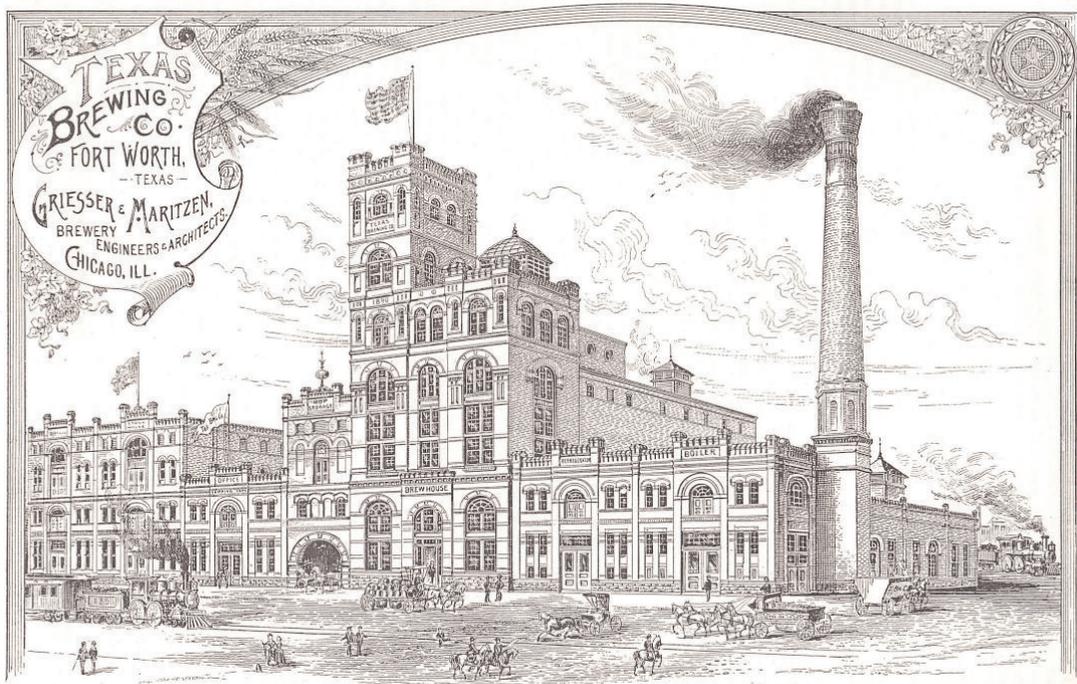


Figure 33. Griesser & Maritzen, architects: Texas Brewing Co., Ft. Worth, TX, 1890. Source: The Western Brewer. XVI, 10, October 1890, p.2258.

WESTERN AGENT FOR THE  
F. E. OTTO  
GRAINS DRYER.

BREWERS  
ARCHITECT  
AND ENGINEER

**Wilhelm Griesser Engineering Co.**

Breweries, Malt Houses, Malt Kilns,  
ICE HOUSES, BOTTLING ESTABLISHMENTS,  
GRAIN ELEVATORS AND WAREHOUSES,  
Distilleries Engine and Boiler Houses.

MONARCH BREWING CO.  
Chicago

Brewery Plant of  
F. X. HASER, Esq.  
CALISTO

Rooms 907, 909, 911  
Schiller Building,  
**CHICAGO, ILL.**

GOTTFRIED BREWING  
MALTING PLANT CHICAGO

Griesser's Patent Mash Tub Valve

Griesser's Patent STEEP TANK Valve

Griesser's New PATENT GELLY CONSTRUCTION BETTER QUALITY CLEAR

Figure 34. Advertisement for Wilhelm Griesser Engineering Co., Chicago, 1894. Source: The Western Brewer. XIX, 5, May 1894, p.925.

Wilhelm Griesser became a prolific and inventive brewery architect and engineer and a superb self-promoter. He continued working from his Chicago headquarters until the end of the century, although he changed his firm's name in 1894 to the 'Wilhelm Griesser Engineering Co'. His ads underscored his engineering prowess, but also increasingly incorporated elaborate images of his architectural work, clearly designed to attract attention [Fig. 34].<sup>111</sup> In 1895 he took into his firm his son, Richard Griesser, then about 27 years old and newly back from two to three years of studying architecture and engineering in 'the technical school of Germany'.<sup>112</sup> Then, at the beginning of 1900, Richard Griesser started his own office in Chicago, slightly before which, his father opened the Wilhelm Griesser Construction Co. in New York City.<sup>113</sup> In 1902 that office moved to Pittsburgh.<sup>114</sup> In later 1904 the elder Griesser became a brewery owner himself, if briefly, when he bought the bankrupt Middle West Brewing Co., Joplin, MO (which owed him money), then sold it on to others in early 1905.<sup>115</sup> Later he moved his office to Joplin (1908), and again to Denver, CO (1909),<sup>116</sup>

sometimes claiming he had offices in two of these places at one time, occasionally all of them. In the much later obituary of Wilhelm's son, Richard (1938), is a clue to what actually was happening with Wilhelm's career: after Richard entered Wilhelm's office, 'Their business was extensive and William Griesser took over the eastern office while Richard was left in charge of the Chicago office in 1900'.<sup>117</sup> On the other hand, Wilhelm Griesser's continual movement suggests a rather frenetic life, especially compared to most other brewery architects (including his son), who may have had far-flung projects, but generally kept their offices in one place. Griesser's frequent moving of premises suggests that he had little in the way of an office staff to hold him in one place for extended periods; still, he did produce a substantial body of work.

Richard Griesser had a solid career himself, working on a variety of smaller to medium-sized breweries in a wide variety of places, including Mexico and China. While his designs also varied, one feature of interest was his sometime use of a rather Flemish-inspired set of



Figure 35. Richard Griesser, architect: Oshkosh Brewing Co., Oshkosh, WI, 1911. Source: Vintage Postcard, collection of the author.

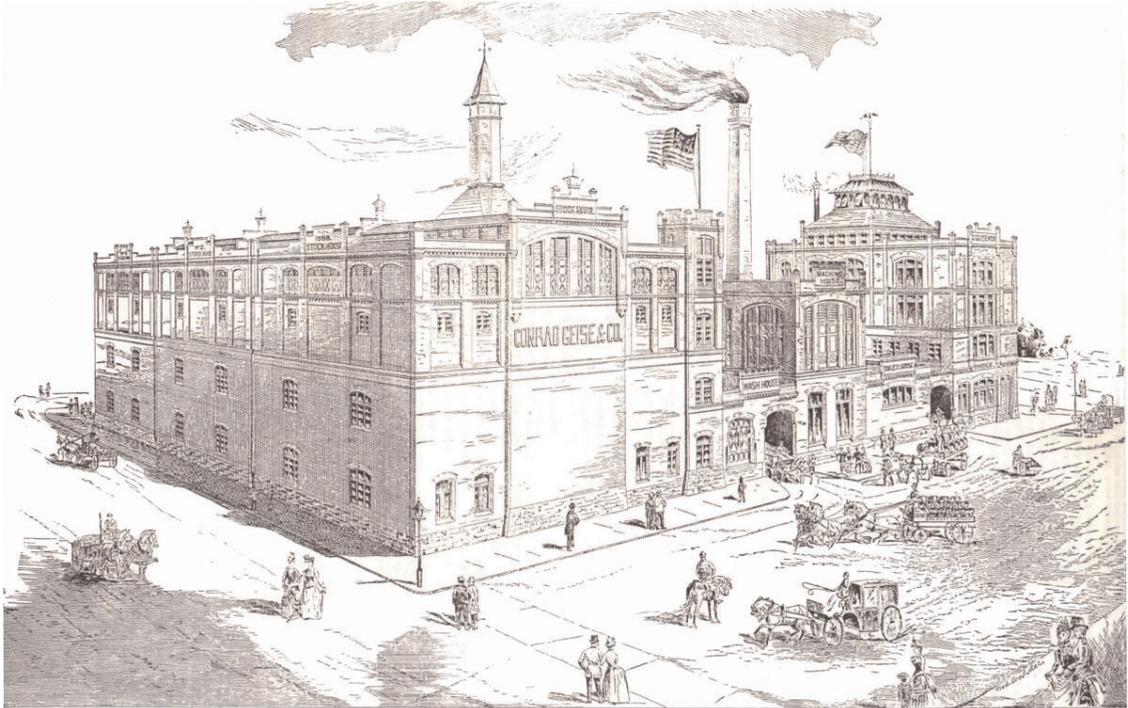


Figure 36. E. Jungenfeld & Co., architects: Conrad Geise & Co. Brewery, Chattanooga, TN, 1888. Source: *The Western Brewer*, XII, 7, July 1888, p.1538.

stepped gables atop the highest element of a design. This motif tied together several of his works, such as the Park Brewing Co., Winona, MN, and the Ohio Union Brewing Co., Cincinnati, both 1904; and the Oshkosh Brewing Co., Oshkosh, WI, 1911 [Fig. 35].<sup>118</sup> Richard was part of what could be termed a ‘third generation’ of American brewery architects (often overlapping the first two ‘generations’), whose works tended to date between the later 1890s and the onset of National Prohibition. In Richard’s case, because of his filial relationship with Wilhelm and Wilhelm’s professional relationship with Jungenfeld, he was literally and figuratively a third generation brewery designer. Both Wilhelm’s and Richard’s careers appear to have waned by about 1915,<sup>119</sup> at a time when architectural projects for breweries were becoming relatively thin, thanks to the impact of World War I restrictions on the use of grain and the gradual onset of National Prohibition.

The most direct and successful examples of his assistants carrying on the lessons of Edmund Jungenfeld as pioneer brewery architect were Frederick Widmann,

Robert W. Walsh, and Caspar D. Boisselier, the principals of the reconfigured, posthumous firm of E. Jungenfeld & Co. These three architects benefited the most directly from their mentor’s passing of all those who worked with Jungenfeld, simply because they were able to acquire his long-established, busy office and a substantial collection of clients, chief among them still the Anheuser-Busch Brewing Association. Unlike Wilhelmi or Wilhelm Griesser, then, Widmann, Walsh, and Boisselier (still operating as E. Jungenfeld & Co.) did not have to build a firm from the ground up. Furthermore, because all of them were well-trained in their former employer’s methods, they soon became widely respected as worthy of the legacy of Edmund Jungenfeld.

An interesting aspect of the new firm was its actual productivity *versus* the degree of coverage it received in *The Western Brewer*. Thanks to the continuity from Edmund to his former assistants, and to the availability of Jungenfeld’s Probate records, it is possible to know more than is often true for other brewery architects

about what E. Jungenfeld & Co. were actually doing in the years soon after the death of Edmund Jungenfeld. In 1885, for example, their projects for Anheuser-Busch were given good coverage in *The Western Brewer* in October, as were their multiple additions to C.G. Stifel's City Brewery, St. Louis, in December.<sup>120</sup> Similarly, in November 1886, *The Western Brewer* featured a series of their additions for Anheuser-Busch. In this last article, attention was drawn again to the guiding principles of the now-deceased Jungenfeld:

The original design of this vast group of buildings, made by the late Edmund Jungenfeld, is being carefully worked out, as they approach perfection and development - as building after building, elevator after elevator is added, by his successors, E. Jungenfeld & Co., who have charge of the entire work, and who have proved themselves worthy of the fame of their instructor, whose ideas and expert judgment he bequeathed into good hands.<sup>121</sup>

Regardless, those were the only three projects reported in *The Western Brewer* in 1885 and 1886. None at all appeared in 1887. Given the higher numbers of articles and mentions in Jungenfeld's day, it might seem that the

'new' E. Jungenfeld & Co. was not very busy at all. Such would seem not really to be the case, however, and Probate records appear to represent more effectively what was actually going on in the firm. Because Widmann, Walsh, and Boisselier agreed to pay a certain percentage of their profits to Jungenfeld's estate for nine years, they were required to submit reports of their financial affairs regularly to the executors for the estate. Consulting the few such reports preserved in the online files shows that, in the first six months of 1885, the firm's clients included, in addition to Anheuser-Busch and Stifel, four other St. Louis breweries (Green Tree, Schilling & Schneider, Wainwright, and Excelsior), one brewery in Chicago (Schoenhofen), one in Omaha (Storz & Iler), and one in San Francisco (John Wieland), in addition to projects for dwellings (which I take to be rentable structures), a stable, and at least four residences (which I read as homes built for specific clients) that seem not to have been directly brewery-related. The same clients appeared on the report for the second half of 1885, with the addition of three more St. Louis breweries or related firms (Brinckwirth-Nolker, A. Griesedieck, and Budweiser Beer & Wine Co.), and six other clients for whom no specific projects were listed. In February 1886 a supplemental inventory submitted to the executors included two more brewery-related clients (Fred Krug, Omaha, and Mrs. Joseph Schnaider, St. Louis) and five others who were probably not associated with brewing.<sup>122</sup> This very instructive information provides an important lesson: one cannot rely entirely on an architect's or firm's appearance in the brewing journals of the day as necessarily indicating the full scope of the work they may have had in hand.

Nevertheless, coverage in the brewing press had to have been worthwhile, especially as more and more brewery architects appeared, anxious for commissions. There is a definite sense of competition running through *The Western Brewer*, especially in the 1880s and 90s. Various brewery architects must have been feeding news of their own projects to the publication, hoping that as many as possible might be mentioned in print, if not given featured status with illustrations. In addition, though, while that journal did serve to keep its readers apprised of the latest in architectural developments, it was more than just a sounding board for brewers and architects. Among many other issues, brewing journals also informed readers of significant new trends in the brewing industry in general. As an example, an article in



Figure 37. E. Jungenfeld & Co., architects: Brew House for Anheuser-Busch Brewing Association, St. Louis, 1891-3. Source: *The Western Brewer*. XVIII, 6, June 1893, p.1293.

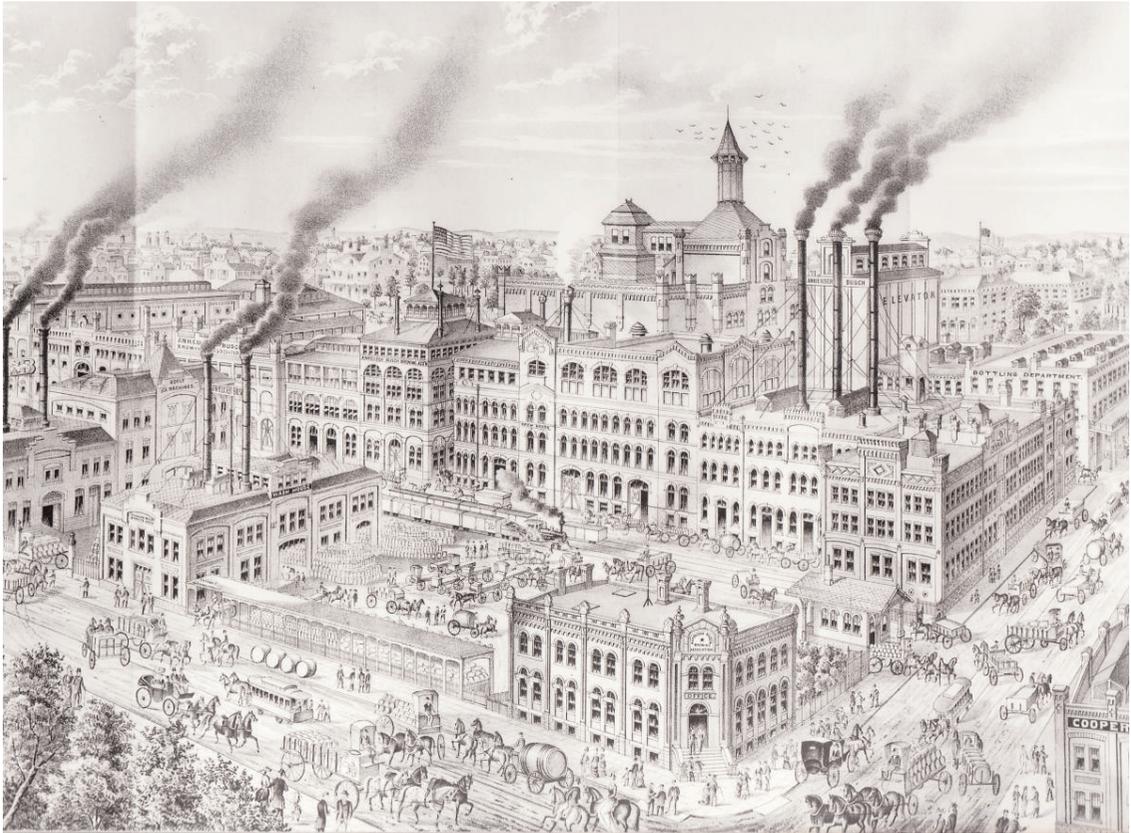


Figure 38. Edmund Jungenfled and E. Jungenfled & Co., architects: Plant of the Anheuser-Busch Brewing Association, 1884, general view. Source: *The Western Brewer*. VIII, 4, April 1884, unpagged supplement.

May, 1888 discussed the new brewery of Conrad Geise & Co., Chattanooga, TN [Fig. 36], noting the ‘massive’ quality of the new brewery’s design, thus showing how it fitted in with the heavier version of the Romanesque Revival hinted at in Edmund Jungenfled’s work and common in later 19<sup>th</sup>-century breweries. Beyond the architectural particulars, however, a major point of interest in the story was the rapid expansion of brewing into the American South during the previous decade, apparent simply in the Geise brewery’s location. Brewing in the South, especially lager brewing, had been almost unknown earlier, because of lager’s need for the cold temperatures that were simply unachievable in hotter climates. Now, though, ‘since the advent of refrigerating machinery ...’, it was becoming easily possible to build new breweries like the one E. Jungenfled & Co. provided Geise & Co., just as other brewery architects found themselves working in places like New

Orleans, Memphis, Nashville, Birmingham, etc.<sup>123</sup> How this new spread of breweries might affect, say, the domination of markets in such areas by the emerging big national distributors must also have engaged the interest of readers.

Still, the glory of brewery architecture in its Golden Age was frequently a topic in the brewing press. One of the finest examples of the full development of that often heavy, fairly Richardsonian Romanesque style in breweries was (and is) the 1891-93 brew house designed by E. Jungenfled & Co. for Anheuser-Busch, St. Louis, mentioned earlier [Figs. 17, 37]. This magnificent building expresses very directly the enormous ongoing success of this brewing firm, particularly in its sheer scale and near stand-alone nature. The huge size reflects the vast quantities of beer that were brewed here, which warranted a structure distinct from other parts of the

brewery. By comparison, the much smaller Conrad Geise & Co. brewery, [Fig. 36], had its brew house folded into a conjoined group of related facilities. Of course, the Anheuser-Busch brew house was also connected to other buildings, but it was intended as the true visual focal point of the entire, sprawling plant. Indeed, the architects were said to ‘have spared neither pains nor expense to comply with the instructions of Mr. Busch: “Make this the finest brew house in the world”’.<sup>124</sup> Its enormous scale is played up in Figure 37, where Edmund Jungenfeld’s brew house of 1879 is dwarfed just to the left of the new building. As Jungenfeld’s important 1879 building had supplanted the vernacular 1856-57 brew house, so E. Jungenfeld & Co.’s 1891-93 brew house supplanted Jungenfeld’s 1869 *Rundbogenstil* brew house, which had been added onto several times over the decades [Fig. 38], until giving way to the current and much larger building.

As for its fineness, the exterior of the 1891-93 brew house is of smooth pressed brick with rich terracotta and limestone trim and a heavily rusticated, granite-faced ground story. The design focuses on the tallest feature, the large corner entrance tower, squarish in plan, with its four-faced clock a major feature in the crown-like top; Figure 37 shows the observation balcony that once allowed the public spectacular views from this considerable height, another play to public relations. The entrance tower is echoed in smaller tower-like elements at the other visible corners. Between towers the front façade features four regular bays of openings, pilastered above the ground story, where the broadest and heaviest arches appear. Openings are fewest in numbers at the bottom, and then increase as they rise, level by level, from single openings to doubles, then triples, with ever more area given to glass. The side façade has a pavilion-like central element capped above the roofline with a stepped gable crowned with those distinctive finials seen previously, which also appear atop the front façade pilasters and the main and secondary corner towers. Overall, the slight projections of towers, pilasters, etc., create sculptural surfaces where varied materials combine with rich textures to create a visually powerful effect.

Inside, the building is anything but heavy, in spite of offering six stories of support for massive water tanks, mash tubs, brew kettles [Fig. 39], etc. Each story is, in essence, a single room, lit by the many windows seen

from the exterior, but especially by the central atrium that rises, entirely open, from the base to the expansive skylight atop the roof [Fig. 40], the sides connected by ornamental, yet functional bridges [Fig. 41]. Reporting on the new brew house in mid-1893, *The Western Brewer* drew attention to the elaborately finished interior, with imported tile floors, polished marble wainscoting, walls and ceilings plastered with Portland cement, polished brass and marble steps with silver-plated railings and ornaments. The sidelights of the skylight and the transoms above all the windows were of stained and embossed glass, featuring the company logo or other brewing emblems in color. Overall, the color scheme of walls, ceilings, and iron work was described as using ‘pale soft tints with occasional touches of bright coloring, lending a warm and cheerful air to the whole’.<sup>125</sup> After the Louisiana Purchase Exposition of 1904, held in St. Louis, Anheuser-Busch acquired and added to the brew house the elaborate hop vine chandeliers made for the Exposition and still seen here [Fig. 42]. Continually refurbished and spotless, this brew house is, as it always has been, a showplace as well as a working building, and it mesmerizes thousands and thousands of visitors each year. Its significance is such that this brew house has been recognized as a National Historic Landmark since 1966.<sup>126</sup>

During the same period when they must have been working on the remarkable Anheuser-Busch brew



Figure 39. E. Jungenfeld & Co., architects: Interior detail, brew kettles, Brew House for Anheuser-Busch Brewing Association, St. Louis, 1891-93. Source: Photograph by the author, 3 October 2009.



Figure 40. E. Jungenfeld & Co., architects: Interior detail, view to atrium skylight, Brew House for Anheuser-Busch Brewing Association, St. Louis, 1891-93. Source: Photograph by the author, 3 October 2009.

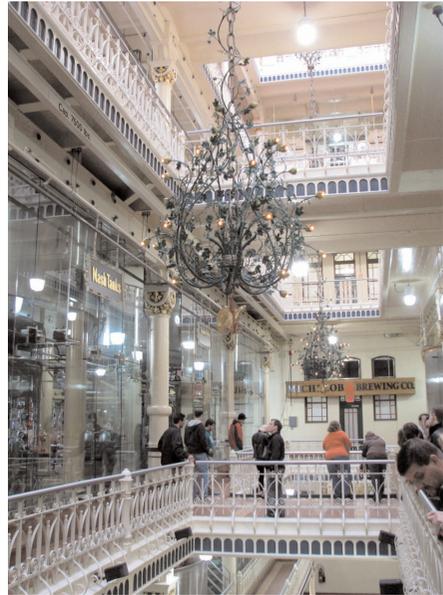


Figure 41. E. Jungenfeld & Co., architects: Interior detail, atrium with visitors, Brew House for Anheuser-Busch Brewing Association, St. Louis, 1891-93. Source: Photograph by the author, 3 October 2009.

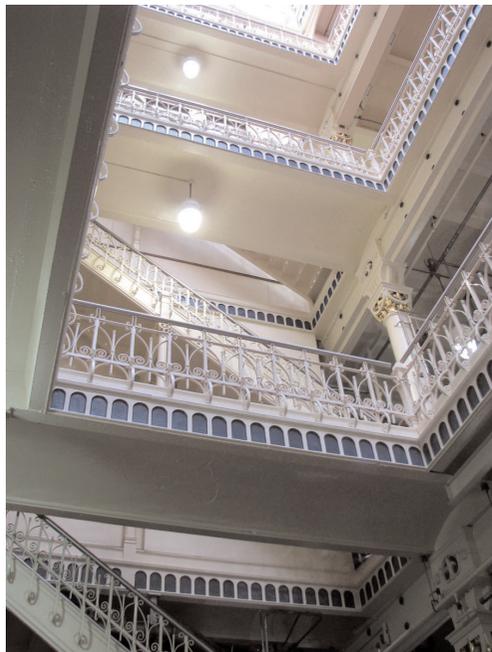


Figure 42. E. Jungenfeld & Co., architects: Interior detail, stairs in atrium, Brew House for Anheuser-Busch Brewing Association, St. Louis, 1891-93. Source: Photograph by the author, October 3, 2009.

house, E. Jungenfeld & Co. moved their office from Olive Street to the newly completed and splendid Wainwright Building [Fig. 43], St. Louis, designed by Adler & Sullivan of Chicago for Ellis Wainwright, St. Louis brewer, whose brewery Edmund Jungenfeld designed in 1883-84.<sup>127</sup> The Wainwright Building is still widely admired for its clear expression of Louis Sullivan's philosophical approach to designing tall buildings in an artistic manner. Their new location put E. Jungenfeld & Co. in what were originally intended to be six offices,

but now rearranged to suit their purposes, forming the most convenient and handsomest offices in the country for brewers' architects and engineers. Their facilities for prompt execution of commissions will be greatly increased [Fig. 44].<sup>128</sup>

Indeed, in 1892-93, E. Jungenfeld & Co. publicized their designs for complete new breweries for the Tennessee Brewing Co., Memphis, TN; the Columbia Brewing Co., St. Louis; the Fred Krug Brewing Co., Omaha, NE; and the American Brewing Association, Houston, TX (for which a company was organized by



Figure 43. Adler & Sullivan, Chicago, architects: Wainwright Building, St. Louis, exterior, 1891. Source: Photograph by the author; March 1982.

In addition, at Anheuser-Busch, they added a large new boiler house with a notable 250' high smoke stack, as well as the very substantial new refrigerating plant [Fig. 28] housing multiple refrigeration machines, including the 500-ton De La Vergne mentioned previously.<sup>130</sup> And to top off all this activity, E. Jungenfeld & Co. designed and built a huge model of the Anheuser-Busch plant for display at the World's Columbian Exposition, Chicago, 1893. With a scale of  $\frac{1}{4}''=1'$ , the model was about 25' square, designed to be displayed within a domed pavilion 27' high. It was 'correct to the minutest detail', and it included the residence, \$35,000 stable, and landscaped grounds of Adolphus Busch, then adjacent to the brewery, along with electric railway cars on three sides of the plant, railway tracks in the brewery yard, freight and refrigerator cars, wagons, horses, etc.<sup>131</sup> With all of this work in hand, the architectural firm must really have needed the additional space their new offices afforded them.

The sheer quantity of work coming to fruition in this period seems to have led the firm to take advantage of a new publicity approach within a relatively short time after the projects above. In 1895 E. Jungenfeld & Co.

published an extensively illustrated catalog of their work, the *Portfolio of Breweries and Kindred Plants Designed and Erected by E. Jungenfeld & Co., St. Louis* [Fig. 45].<sup>132</sup> This volume featured multitudes of photographs of their many projects, if very little textual information on those. The idea of a brewery architect or firm putting out a pictorial catalog seems to have begun with Otto C. Wolf (based in Philadelphia), whose first catalog appeared in 1891, followed in late 1892 by that of August Maritzen (based in Chicago). E. Jungenfeld & Co.'s came next, in 1895, followed by a variation in Fred W. Wolf's late 1899 catalog, which focused less on architecture and more on clients for the German Linde ice machine for which Wolf (in Chicago) held the American rights. C.F. Terney, a brewery architect headquartered in New York City and then Washington, DC, published an architectural catalog in the fall of 1900, reprinting an only slightly modified version in 1910, and Otto C. Wolf put out a second edition of his catalog in 1906.<sup>133</sup> All of these served to familiarize the public - and potential clients, of course - with their work and the degree of success and sophistication each had achieved. These catalogs are today typically rare, but when one can be found, it can help to flesh out - and sometimes correct - the images of breweries more commonly seen in journals like *The Western Brewer* in linear engravings that were often subject to much artistic license.

Eventually, at the beginning of 1898, E. Jungenfeld & Co. changed its firm name to Widmann, Walsh & Boisselier,<sup>134</sup> bringing its principals more direct public attention [Fig. 46-48]. They continued to operate successfully under that name until about 1906 and the retirement of C.D. Boisselier.<sup>135</sup> Within those years, according to Theodore Savage, the firm received many residential commissions from leading families on the German South Side of St. Louis. They also worked with the Monarch Brewing Co., Baltimore, MD; the M.K. Goetz Brewing Co., St. Joseph, MO; and the Wm. J. Lemp Brewing Co., St. Louis, as well as the St. Louis Cold Storage Co. and John V. Petritz at the former Peacock Brewery, Rockford, IL, among others.<sup>136</sup> And they continued their relationship with Anheuser-Busch, as in designing the splendid and technically advanced new malt house of 1900, which housed a Galland-Henning Pneumatic Malting Drum plant,<sup>137</sup> along with other significant projects. For the Louisiana Purchase Exposition (the St. Louis World's Fair) of 1904, they designed the Machinery Building, which had 'a number

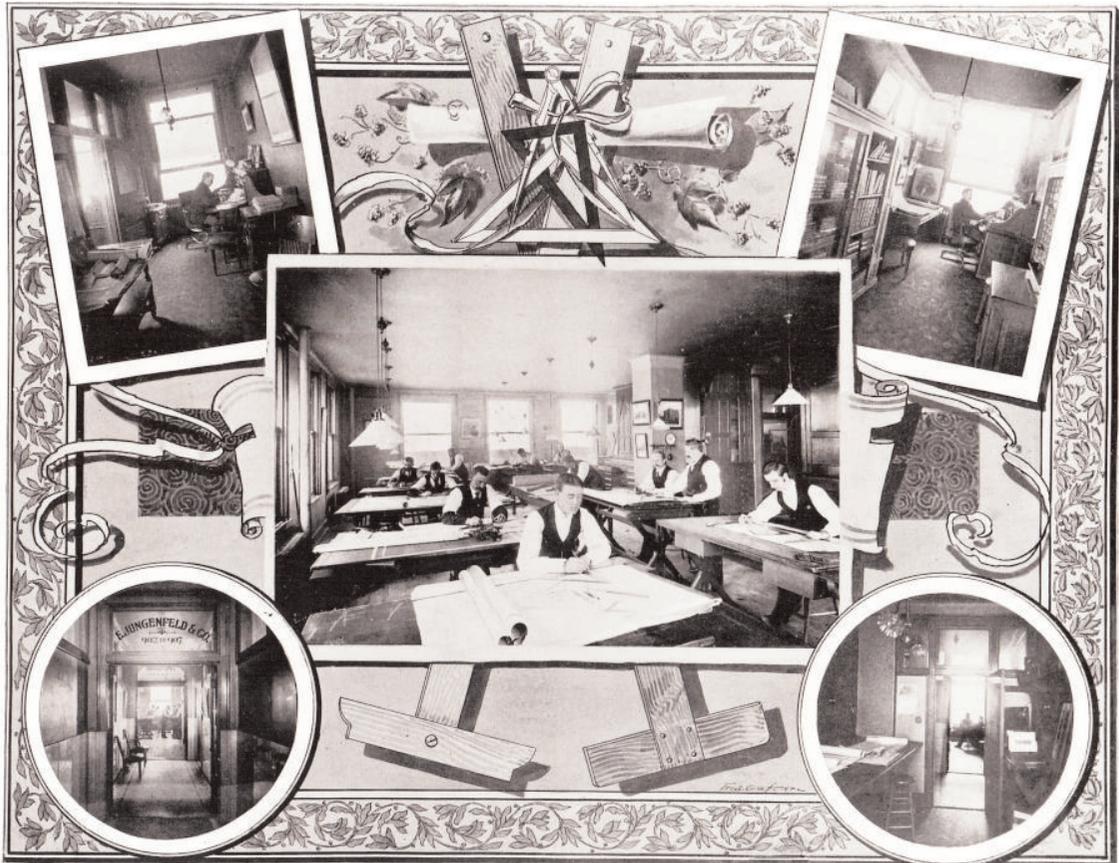


Figure 44. Page with five views of the offices of E. Jungenfeld & Co., Wainwright Building, St. Louis. Source: E. Jungenfeld and Co. (1895) Portfolio of Breweries and Kindred Plants Designed and Erected by E. Jungenfeld & Co., St. Louis. St. Louis, n.p.

of peculiarities that distinguish it from the other buildings of the main Exposition picture', among which was that it housed the electric light and power plant, installed by the Westinghouse Electric Co., that distributed electricity to the entire fairgrounds.<sup>138</sup> Their responsibility for this major Exposition building, along with the importance of their wider involvement in the Fair, brought them still more prestige.

With Boisselier's retirement about 1906, the firm reconfigured as Widmann & Walsh, under which title they continued until Widmann's death in 1925.<sup>139</sup> In spite of the beginnings of hard times that took the nation through World War I, then the first of 13 years of National Prohibition, Widmann & Walsh managed, in the time between 1906 and 1920, many additional brewery projects for numbers of clients, including Anheuser-

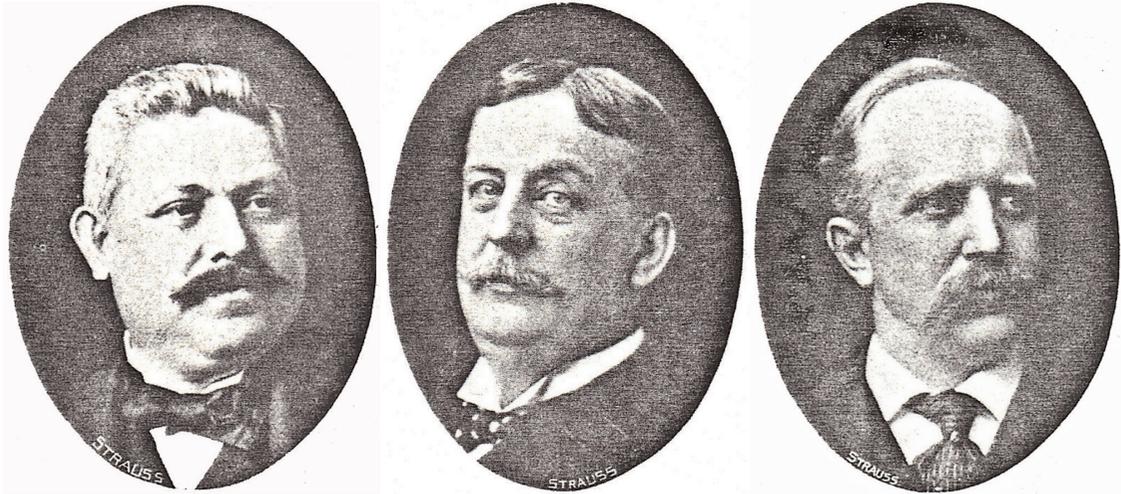
Busch. One of the many blows of this period, however - to the brewery, the architects, and the industry - was the death of Adolphus Busch on 10 October 1913.<sup>140</sup> Before that, Widmann & Walsh exhibited in the American Exposition of Brewing Machinery, Materials & Products, held in Chicago in October 1911 in conjunction with the Second International Brewers' Congress. Their exhibit included photographs and other images illustrating brewery construction from 'olden times' to the present, including their great 1891-93 brew house for Anheuser-Busch. It was also during that event that Frederick Widmann, by now a long-established practitioner of American brewery architecture, gave his address assessing the history of his field, the address with which this essay began.<sup>141</sup> He had then been a principal player in this field for 27 years, over a decade longer than Edmund Jungenfeld's career.



Figure 45. Title page of the E. Jungenfled & Co. Portfolio, 1895, n.p.

Five years after the Chicago exposition came Widmann & Walsh's last great addition to the architectural grandeur of the Anheuser-Busch plant, their design for the eight-story, \$2.5 million<sup>142</sup> Bevo Bottling Plant of 1916-1917 [Fig. 49], built in collaboration with the St. Louis firm of Klipstein & Rathmann.<sup>143</sup> Filling an entire city block, this huge structure was at one and the same time a statement of the company's determined belief in its future and a kind of bowing to the inevitability of the coming of Prohibition. Sales of Anheuser-Busch beers had fallen seriously through 1914, a fact that Plavchan saw as indicative of the growing success of the prohibitionists.<sup>144</sup> Many brewers responded to that threat by introducing low- or non-alcoholic beverages, commonly called 'near-beers', as a means of continuing to operate in the new atmosphere of the times. 'Bevo' was a non-alcoholic 'cereal soft drink' made of barley

malt, rice, hops, and water that Anheuser-Busch introduced in May 1916. Initially, Bevo was very popular, so much so that new bottling facilities to handle it were necessary; hence, the rationale behind the Bevo plant.<sup>145</sup> The building was intended exclusively for bottling, packing, and shipping Bevo, which was brewed in the 1891-93 brew house, then piped by tunnel to an upper floor of the new building and processed downward until it arrived at the loading platforms in the basement. From there, it could be stored or shipped via the building's 13 interior railroad tracks, each with a 10-car capacity. While this makes it sound as if Anheuser-Busch were continuing to be highly successful, their sales continued to fall, and like other brewers large and small, their production was increasingly negatively affected by national war-time restrictions on the use of grains and by steeply rising taxes, which worked hand-in-hand with the efforts of prohibition



Figures 46, 47 & 48. Portraits left to right of Frederick Widmann, Robert W. Walsh and Caspar D. Boisselier, architects, St. Louis, c. 1905. Source: Bennitt, M. (comp.) (1905) *History of the Louisiana Purchase Exposition*. St. Louis: University Exposition Publishing Company, p.119.

supporters. Finally, after many years of trying, those prohibitionists were able to push the 18<sup>th</sup> Amendment to the Constitution through the U.S. Congress in December 1917. Once enough states ratified the proposed amendment, National Prohibition finally took effect on 16 January 1920.<sup>146</sup>

The stories of how brewers sought to maintain some kind of business once they could no longer legally brew beer are many and varied and often inventive (like adapting underground vaults for the growing of mushrooms or ripening of cheese). Naturally, the enormous turn of events that was the imposition of Prohibition also hit hard the brewery architects who had devoted their careers to this architectural specialty, often for decades. Their primary source of livelihood was gone, along with the brewers', almost in a flash - even if hindsight showed that it was possible to see the change coming for some time.<sup>147</sup> Records of what happened to brewery architects are very thin, presumably because so many of them simply had no work and closed their offices, their records more often than not just disappearing over the coming years. This is why the information relayed in this essay relies on a wide variety of sources, only a tiny proportion of which connect directly and in any detail to the architects themselves, as in the Probate records of Edmund Jungenfeld's estate.

Widmann & Walsh survived, at least briefly, beyond the onset of National Prohibition; in 1921 the firm was lauded, if with a certain tone that suggests things were winding down:

This [firm] is today one of the oldest and most prominent firms of architects in St. Louis. They have specialized in brewery buildings and in this particular field did a business exceeding that of all of the firms in the world. They built buildings all over the United States including the Anheuser-Busch Brewing Company's plants. They have also erected many other buildings, and their structures have always enjoyed a splendid reputation for the substantial character of the work and the absolute fitness of the buildings for the purpose intended.<sup>148</sup>

That must have been bittersweet praise under the circumstances, but it does indicate that some brewery architects retained a modicum of prestige despite what had just happened to their business.

Regardless, all three of the once-chief assistants to Edmund Jungenfeld were dead by the end of the 1920s, Widmann in 1925 at age 66, Walsh about 1929 at about age 69, and Boisselier in 1929 at about age 75. Similarly, Otto J. Wilhelmi died in 1925, at about age 72, but no death notice has yet come to light for



Figure 49. Widmann & Walsh and Klipstein & Rathmann, architects: Bevo Bottling Plant for Anheuser-Busch Brewing Association, St. Louis, 1916-17. Source: Photograph by the author, March 1995.

Wilhelm Griesser, a fact that perhaps comments on his fall into oblivion once brewing was legally dead. Richard Griesser (as noted above) lived until 1938 and to the age of 70, and was the only brewery architect discussed here who is known to have worked after the Repeal of Prohibition in 1933.<sup>149</sup> How many other pre-Prohibition brewery architects may still have been available following Repeal is not known, but a 13-year hiatus would probably incline them to other directions, if they remained active at all.

Architecture in the 1930s and beyond differed from that before 1920, and so did the American brewing industry, once it began to reformulate itself after Repeal in 1933. While numbers of pre-Prohibition breweries reopened in their earlier plants after Repeal, new additions or new breweries shifted fairly strongly in style in more modernist directions. Further, American breweries began to consolidate, the larger firms often putting the smaller ones

out of business, and changing substantially the earlier situation, when a vast array of variously sized breweries could be found across the country. This process continued for decades, gradually cutting the numbers of functioning American breweries in the Midwest and everywhere else. Only with the new wave of micro-breweries, brew pubs, and other versions of craft brewing, begun in the 1970s and now extremely vigorous, has the number of American breweries soared. But today's craft breweries are typically limited in size and housed in buildings that, for various reasons, bear little resemblance to the architect-designed breweries of pre-Prohibition days. Old breweries still stand, some renovated and adapted to new uses, but others abandoned and neglected, often for decades. The longer that continues, the more common it is that they fall apart or are demolished.<sup>150</sup>

As a result, too few examples stand today as testament to the skills and extraordinary impact of dedicated pre-

Prohibition American brewery architects. The rise of these specialists appears to have been a function of the intersection of American architecture and the American brewing industry when both were in significant periods of their histories. Immersing themselves in the close study of an industry in vibrant transition, the pioneer generation of brewery architects like Edmund Jungenfeld set in motion a very special kind of architecture that, through the pioneers' inspiring impact on younger designers, came to characterize American breweries in the several decades before Prohibition. Today we can know their work, if it survives at all, in forms generally much modified by time. Often we can understand the breadth of that work only spottily, sometimes only through early images and written descriptions. But we can know about these designers, and we should acknowledge their importance more than we typically do. Indeed, enough evidence remains to reinforce Frederick Widmann's appreciation of the generation that taught and inspired his own. Edmund Jungenfeld and his contemporaries brought American brewery architecture out of the small-scale and vernacular world into the realm of grand yet functional new form, driven by intellectual collaboration that was carefully attuned to the needs of a burgeoning industry.

## References

1. Widmann, F. (1912) 'The Development of the Buildings and Equipments of Breweries from Pioneer Times to the Present Day', *The Western Brewer*. XXXVIII, 1, January, p.29. The paper published here, pp.29-32, was noted as having been delivered to the Second International Brewer's Congress in Chicago in October, 1911. *The Western Brewer* and *Journal of the Barley, Malt and Hop Trades*, published in Chicago beginning in 1876, was the most important industry journal in the Midwest before Prohibition, and especially notable for its frequent illustration of new and remodeled breweries.
2. *ibid.*
3. *ibid.* Anthony Pfund (1823-97) was the oldest, born in Baden and educated at the Karlsruhe Polytechnic, who came to the U.S. in 1848. Charles Stoll (1835-93) was from the province of Nassau in the Prussian Kingdom, came to the U.S. at age 12, and was trained as a millwright and machinist. Fred Wolf (1837-1912) was born near Heidelberg, educated as a mechanical engineer at the Karlsruhe Technical College, moved to New York City in 1866, then settled in Chicago in

1867. The life of Edmund Jungenfeld (1841-84) will be discussed throughout this essay. On Pfund, see: 'Report of the Historiographer', *Proceedings of The American Numismatic and Archaeological Society of New York City*, 39<sup>th</sup> Annual Meeting, 15 March 1897, New York: Printed for the Society, via [http://books.google.com/books?id=dZEUAAAAYAAJ&pg+RA2-PA12&lpg ...](http://books.google.com/books?id=dZEUAAAAYAAJ&pg+RA2-PA12&lpg...) (etc.), accessed 11/02/08). For Stoll: Smith Pelletreau, W. (1907) *Historic Homes and Institutions and Genealogical and Family History of New York*. Vol. II. NY & Chicago: The Lewis Publishing Co., p.316. For Wolf: 'Fred W. Wolf, Deceased', *The Western Brewer*. XXXVIII, 3, March 1912, p.129.

4. Widmann came to the United States in 1874 at the age of 15. Walter Barlow Stevens, in his (1921) *Centennial History of Missouri: (the Center State) One Hundred Years in the Union, 1820-1921*. St. Louis & Chicago: The S.J. Clarke Publishing Co., Vol. 4, pp.439-440, noted that Widmann served a three-year apprenticeship in the carpentry trade, then studied architecture in the office of Walsh and Jungenfeld. Marquis, A.N. (ed.) (1912) *The Book of St. Louisans, A Biographical Dictionary of Leading Living Men of the City of St. Louis and Vicinity*. 2<sup>nd</sup> ed. Chicago: A.N. Marquis & Company, p.635, stated that Widmann was educated 'in the art branch of Washington University, St. Louis', although when is not clear. Both Stevens and Marquis date Widmann's presence in the Walsh-Jungenfeld firm from 1877. More recently, Toft, C.H. (1989) 'Thomas Waryng Walsh [St. Louis Architects: Famous and Not So Famous, Part 15]', first published in 'Landmarks Letter', September/October, Landmarks Association of Saint Louis, via <http://stlouis.missouri.org/501c/landmarks/architects15.html> (accessed 11/3/2008), dates the split of Jungenfeld from Thomas Walsh to around 1881. However, the E. Jungenfeld & Co. firm name was in use as early as 1879, as, e.g., in 'Great Breweries of the World: the Anheuser-Busch Brewing Association, St. Louis', *The Western Brewer*, IV, 12, December 1879, p.1091.
5. The change of the firm name to Widmann, Walsh & Boisselier was announced in January, 1898, *The Western Brewer*. XXIII, 1, January, pp.7, 102.
6. 'Brewery Building in St. Louis, Premises and Plant of the Wainwright Brewery Co.'s New Brewery', *The Western Brewer*. IX, 5, May 1884, pp.829-830.
7. *Edwards' St. Louis Directory*, 1868.
8. *ibid.*, 1869 and 1870.
9. Toft, C.H. (1989) *op. cit.*.
10. *ibid.*, and *Gould's St. Louis Directory*, 1874.
11. Compton, R. & Dry, C. (1876) [1979] *Pictorial St. Louis: The Great Metropolis of the Mississippi*. St. Louis: Compton & Company, reprint, St. Louis: Knight Publishing Company, Pl. 21.

12. *ibid.*, p.183.
13. Obituary for Eberhard Anheuser, *Anzeiger des Westens* (St. Louis), 3 May 1880, translated in (1993) 'The History of Anheuser-Busch Companies - A Fact Sheet', Anheuser-Busch Companies, Inc., p.10.
14. The brewery was run as E. Anheuser & Co. from 1860 to 1875, with the firm initially composed of Eberhard Anheuser and Wm. D'Oench. Van Wieren, D.P. (1995) *American Breweries II*. West Point, PA: Eastern Coast Breweriana Association, p.188; and Plavchan, R.J. (1976) *A History of Anheuser-Busch, 1852-1933*. New York: Arno Press, pp.10-20.
15. Plavchan, R.J. (1976) *op. cit.* pp.25-26, dated this wedding to 7 March 1861, and noted that, when D'Oench retired from his position as Anheuser's partner, Busch was more than prepared to try his hand at a new business.
16. *ibid.*, pp.26-27.
17. There are discrepancies among sources as to when different titles were adopted for this company, but Plavchan, R.J. (1976) *op. cit.* p.38, states that 'E. Anheuser & Co.'s Brewing Association' was the name adopted at incorporation, 7 July 1875. The 1879 name change was reported in 'Great Breweries of the World' (1879) *op. cit.* p.1091.
18. *The Western Brewer*, IV, 6, June 1879, p.531. Plavchan, R.J. (1976) *op. cit.* p.39, specified that a change of firm name to 'Anheuser-Busch Brewing Association' was filed on 29 April 1879.
19. Even in the early 1860s, Guyer, I.D. (1862) *History of Chicago, Its Commercial and Manufacturing Interests and Industry*. Chicago: Church, Goodman & Cushing, p.43, noted, 'Within the last few years, however, the consumption [of lager] has increased so enormously, not merely among the Germans, but among our native population, that its manufacture forms an important item of productive industry'. Baron, S. (1962) *Brewed in America: A History of Beer and Ale in the United States*. Boston: Little Brown & Company, p.228, stated that 'By the 1870s the American drinking public had made a clear choice for lager beer over ale, porter and the other English beers'.
20. A good example of this conflict occurred on 17 September 1854, when the city's supplies of beer totally ran out, creating near panic, since brewing for the year would not commence until sometime later. This disaster occurred despite the fact that St. Louis's 24 or so breweries had manufactured twice the beer of the year before. 'Local Matters/Beer', *Missouri Republican* (St. Louis), 21 June 1857; Scharf, J.T. (1883) *History of St. Louis City and County*. Philadelphia: L.H. Everts & Company, II, p.1331, quoting *Missouri Republican*, 20 September 1854.
21. Plavchan, R.J. (1976) *op. cit.* p.29. Busch and his former partner, Chas. Rueppele, consented mutually to the dissolution of their partnership on 7 June 1869. Further support for the brewery expansion came from a \$50,000 bank loan.
22. Adolphus Busch was born about 1840 (Plavchan, R.J. (1976) *op. cit.* p.21, says 1839 is likelier) in Kastell, near Mayence-on-the-Rhine (Mainz), the youngest of the 21 children of a large landholder. He was well educated in Mainz and Darmstadt, and sought a commercial career in Cologne before he took the advice of several older brothers already in the U.S. and emigrated in 1856, arriving in St. Louis in 1857. Two years later, after working in businesses along the levee, Busch's inheritance allowed him to establish himself in the brewers supply business in St. Louis. *One Hundred Years of Brewing: A Complete History of the Progress Made in the Art, Science and Industry of Brewing in the World, Particularly During the 19th Century*, Supplement to *The Western Brewer*. Chicago and New York: H.S. Rich and Company, 1903, p.349; Plavchan, R.J. (1976) *op. cit.* pp.21-25.
23. 'Brewery Building in St. Louis, Premises and Plant of the Wainwright Brewery Co.'s New Brewery', *The Western Brewer*. IX, 5, May 1884, p.829.
24. Dimensions are estimates by the author based on scale notations on drawings published in the large unpagged supplemental illustration accompanying 'Great Breweries of the World' (1879) *op. cit.* See Fig.7.
25. Hübsch, H. (1992) 'In What Style Should We Build?' pp.63-102, in *In What Style Should We Build? The German Debate on Architectural Style*, Texts & Documents series. Santa Monica, CA: The Getty Center for the History of Art and the Humanities. Originally, Hübsch's essay was titled 'In welchem Style sollen wir bauen?' and published in Karlsruhe in 1828.
26. 'Cincinnati and the Lion', pamphlet, Cincinnati: Lion Brewery, 1933, n.p., collection of Rick Muhlhauser, Cincinnati, OH. This building was demolished about 1993.
27. A possible exception is the rather thin connection between the architect Joseph Gottle (more commonly spelled Goettle), of Cincinnati, who is associated with Bernhard Stroh's new Lion Brewery, also opened in 1867, but in Detroit, as noted in Blum, P. (1999) *Brewed in Detroit; Breweries and Beers Since 1830*. Detroit: Wayne State University, p.60. Thus far, only very general information has been found on Goettle, other than his home and office addresses in Cincinnati city directories and a simple obituary recording his death on 29 June 1892, which gives no birthdate, in *Cincinnati Volksblatt*, 1 July 1892, 8, cited in Herbert, J.G. (1998) (indexer) *Index of Death Notices Appearing in the Cincinnati Volksblatt 1846-1918*. Cincinnati: Hamilton County Chapter, The Ohio Genealogical Society, p.133.

28. Plavchan, R.J. (1976) op. cit. p.29.
29. *One Hundred Years of Brewing*. op. cit., p.349.
30. *Der Amerikanische Bierbrauer*. New York, VII, 6, June 1874, pp.118-119. At this point the nation's largest brewery was Conrad Seipp's brewery in Chicago, then producing 103,697 bbs., with Philip Best's Brewing Co. (later Pabst), Milwaukee, in second place at 100,033 bbs.
31. *One Hundred Years of Brewing*. op. cit. p.349; Plavchan, R.J. (1976) op. cit. p.27. In 1860 (when Eberhard Anheuser acquired the Bavarian Brewery), St. Louis had 40 operating breweries producing a total of 200,000+ barrels of beer. The range of production ran from the largest (about 23,200 barrels) to the smallest (about 500 barrels), according to James Lindhurst, 'History of the Brewing Industry in St. Louis 1804-1860', M.A. thesis, Washington University, St. Louis, 1939, p.110. By the early 1880s, the number of St. Louis breweries had fallen to 25, 22 of them producing lager, two Weiss beer, and only one ale, as reported in *Tovey's Official Brewers' & Maltsters' Directory of the U.S. & Canada*. New York, 1882, pp.57, 59. In 1885, total beer production in St. Louis was reportedly up to 1,086,032 barrels, according to Yeakle Sr., M.M. (1889) *The City of St. Louis Today: Its Progress and Prospect*. St. Louis: J. Osman Yeakle and Company, p.221.
32. Plavchan, R.J. (1976) op. cit. pp.68-75.
33. 'Adolphus Busch, Esq., St. Louis', *The Western Brewer*. VII, 10, October 1882, p.1575.
34. Plavchan, R.J. (1976) op. cit. p.77.
35. 'How St. Louis Beer is Supplied to the Rest of the Country', *Missouri Republican*, St. Louis, 13 January 1877, p.8. The same article declared, 'Until recently, it has been customary for Americans to think that to enjoy a superior bottled article it must be imported from England. Anheuser & Co. are showing the people of this continent that St. Louis bottled beer is not surpassed by any in the world, and, being furnished at a much lower price, the natural result is that European beer is steadily being supplanted in all the markets of the Western hemisphere by a home article'.
36. 'Great Breweries of the World' (1879) op. cit. p.1091, where it was also noted that the bottling and packing department 'is provided with independent huge storage sheds for bottles and straw and bottle wash house. The bottling house is the completest of its kind, and provided with all requisite machinery, elevators and appurtenances for the different methods of packing in barrels or boxes'.
37. The origins of Budweiser are told in several similar, if conflicting ways, and the legal conflict over Anheuser-Busch's right to the name was still playing out in the later 20<sup>th</sup> century. 'Anheuser-Busch Has Achieved a World's Record', *St. Louis Commerce* 30 July 1956, p.8, noted the introduction of Budweiser in 1876, made from a recipe perfected over some years of testing in the restaurant of Carl Conrad, then developed for the national market by Busch. Rice, J. (1970) 'Gussie Busch: Beer Dynasty Dynamo', *Post-Dispatch*. 19 April, Breweries Clipping file, St. Louis Public Library, reported that Carl Conrad, a wine salesman, had found a monastery-made beer on a trip to Budweis, Bavaria, the formula for which Conrad bought, along with the right to brew it in the U.S., which developed into Budweiser and which Conrad brewed for Anheuser-Busch. 'The History of Anheuser-Busch Companies - A Fact Sheet', A-B Companies, Inc., 1993, p.16, said that the story involved Busch's travels in Southern Germany, Bavaria, and the area around Pilsen (now in the Czech Republic), from which he collaborated with Carl Conrad, St. Louis wine merchant and restaurateur, 'to develop a new brand of beer that would be acceptable to all tastes'. This was 'lighter in color and body and with a more delicate taste than the Pilsner beer, which was then the most popular type of beer available'. Intended as a 'national' beer, it was named Budweiser 'because it had a slightly Germanic sound to it yet was easily pronounceable by Americans; thus it would appeal to both native Americans and German immigrants'. Also, the name was not then used by anyone else in the U.S., so it was not a copy, 'thus enhancing its image as a new 'national' beer'. (Many would later try to use the name.) 'In 1877, Conrad applied for and in January 1878 was granted, a trademark for Budweiser'. Busch was to brew it, Conrad to bottle it, which continued until 1883.
38. *The Western Brewer*. IV, 10, October 1879, p.872.
39. Rice, J. (1970) op. cit. stated that in 1880, Carl Conrad's financial troubles led him to take out a loan with Adolphus Busch. After Eberhard Anheuser died that same year, Busch offered Conrad money and a vice-presidency for the Budweiser recipe. Conrad accepted, 'and Busch set out to conquer the national market, leaving St. Louis to Lemp'. Anheuser-Busch itself ('The History of Anheuser-Busch Companies - A Fact Sheet', 1993) claimed to take over the bottling of Budweiser in 1883.
40. Plavchan, R.J. (1976) op. cit. p.70. Adolphus Busch continued to be the dominant force in the brewing firm; by 1879, Eberhard Anheuser was described as having essentially retired from active involvement, thanks to the infirmities of age, and had passed the mantle of the business to Busch. 'Great Breweries of the World' (1879) op. cit. p.1091. Anheuser died on 2 May 1880.
41. 'Great Breweries of the World' (1879) op. cit. p.1091.
42. *ibid.* Plavchan, R.J. (1976) op. cit. p.50, refers to the enlargement of the brewery as becoming imperative by 1876, and he dates to that year the beginning of a building program

he described as seemingly never completed.

43. *The Western Brewer*, IV, 1, January 1879, p.36.
44. *ibid.*, IV, 2, February 1879, p.134.
45. *ibid.*, IV, 3, March 1879, p.204; Jungenfeld was here first identified as the St. Louis partner of the constructing firm of Theo. Krausch & Co.
46. *ibid.*, IV, 4, April 1879, p.296.
47. *ibid.*, IV, 5, May 1879, Supplement, n.p.
48. 'Great Breweries of the World' (1879) op. cit. pp.1091-1092 + Supplemental illustration.
49. These motifs consist of a pair of elements sitting on a low square base, the upper features right-angled on the outer edges, with arcs connecting the ends of the angled sides; there is sometimes, but not always, a short horizontal element connecting the lower edges of the upright forms. Paula Lupkin has dubbed these Eselohren, or 'donkey's ears', but I think that one would have to reverse a donkey's right and left ears, then shorten and abstract them geometrically to get closer to this shape. Lupkin, P. (2010) 'Adolphus Busch's Lager Landscape', a paper-in-progress presented at the Newberry Seminar in American Art and Culture, Newberry Library, Chicago, February.
50. *The Western Brewer*, IV, 10, October 1879, p.872.
51. Plavchan, R.J. (1976) op. cit. pp.55-56.
52. Surface coolers would eventually give way to mechanical cooling via large Baudelot coolers, composed of various numbers of pipes filled with chilled brine over which the hot wort would be channeled on its way to fermenting, thus freeing up the space previously needed for surface coolers. A small Baudelot is indicated on the second story of the machine house in the 1879 section drawing.
53. There were also many later breweries that used basic features seen in Jungenfeld's 1879 brew house, but enlarged and blended with the mansard roofs of the French Second Empire style. An example was the brew house for the Peter Schoenhofen Brewing Co., Chicago, credited to Chicago-based brewery architect, Maritzen, A. (1892) in 'Brewing in Chicago, Description of the Brewing Plant of the P. Schoenhofen Brewing Co., Chicago', *The Western Brewer*. XVII, 10, October, p.2250.
54. 'Brewing in St. Louis', *The Western Brewer*. XVIII, 6, June 1893, pp.1293-1294. The architects were still operating then as E. Jungenfeld & Co. This later brew house is discussed later in this essay.
55. *The Western Brewer* noted that the arrangement of the various tanks and kettles 'clearly illustrates the labor-saving principle of its construction on the smallest possible superficial area. From the cold water tank and hoppers to the grand [grant], everything runs without the assistance of

pumps'. 'Great Breweries of the World' (1879) op. cit. pp.1091-1092.

56. *The Western Brewer*. XXXII, 1, January 1907, p.46; Plavchan, R.J. (1976) op. cit. p.77. Production totals and annual sales were often reportedly differently in different sources, sometimes relying on a May-April calendar, sometimes on a January-December calendar, etc.
57. *Amerikanische Bierbrauer*. New York City, II, No. 13, 1 July 1869, p.152.
58. *ibid.* V, No. 7, 1 July 1872, p.117.
59. Becker, V.H. (1912) 'The Relation of Refrigeration to the Art of Brewing', *The Western Brewer*. XXXVIII, 5, May, p.223. Becker reported that Krausch and John Enright put in a Silas Merchant refrigeration machine built with piping over ice in a Theodor Krausch patent ice house at the Ziegele brewery, where ice was melting and not expected to last the summer. The Merchant machine was said to have kept the remaining ice successfully all that summer and the next one as well. Ziegele was the first brewer in Buffalo to make use of a refrigeration machine.
60. 'The Lion Brewery, M. Brand's Extensive North Branch Improvement', *The Western Brewer*. II, 9, September 1877, p.344.
61. The contract with Lemp called for refrigeration apparatus to cool six cellars (100 x 21'), a racking room (30 x 50') and an ice house (50 x 70'), with the additional capacity to make 350 tons of ice water per day, all to be completed by 18 July 1878. *The Western Brewer*. III, 6, June 1878, p.363.
62. *The Western Brewer*. III, 11, November 1878, p.740 (for the announcement of the association), and p.764 (for the full-page ad).
63. *The Western Brewer*. V, 4, April 1880, p.370, where the quote continued, 'and [Krausch] contemplates an extended European trip and otherwise'. In the following issue of this journal, V, 5, May 1880, p.477, a correction appeared: 'Mr. Theodore Krausch disclaims any intention of going to Europe. He will remain in Chicago, and handle his specialties for brewers as heretofore'.
64. Probate Court, St. Louis City County, Jungenfeld, Edmund, Case No. 15261, Date filed - 1884, Microfilm Reel C36979; digitized under Secretary of State Jason Kander, Missouri Digital Heritage, Missouri's Judicial Records, © 2007-2013, <http://www.sos.mo.gov/archives/mojudicial/images.asp?id=16805&party=Jungenfeld,%20Edmund&case=15261&date=1884&County=St.%20Louis%20City&courtType=Probate%20Court&reel=C%2036979>, Coll. 2 (accessed April 2013).
65. For a general overview of this development, see Appel, S.K. (1990) 'Artificial Refrigeration and the Architecture of American Breweries', *IA: The Journal of the Society of*

*Industrial Archeology*. XVI, 1, pp.21-38.

66. To set the tone of the time regarding refrigeration machines, a slightly later passage may be helpful: 'In the present state, and with the constant progress of science, the thorough study and mastering of a special branch of science is so vast, extensive and difficult that it almost absorbs the whole time, activity and thoughts of the student, but at the same time opens up new fields for his industry, and thus for example, Mr. Jungenfeld has started the Empire Refrigerating Co., whose rapid success is mainly due to his untiring energy and thorough knowledge of the necessities of the brewing trade'. 'Brewery Building in St. Louis, Premises and Plant of the Wainwright Brewery Co.'s New Brewery', *The Western Brewer*. IX, 5, May 1884, p.830.

67. *The Western Brewer*. VII, 7, July 1882, p.1047. Krausch's 1877 experiment at the Ziegele brewery was here described as using direct gas circulation as a refrigerant with a Silas Merchant Ammonia Compressor. By contrast, the move to brine circulation, most often using compressed ammonia, would become standard in the 1880s, and was already featured by the Empire Co.

68. *ibid.*

69. *The Western Brewer*. VII, 7, July 1882, p.1113. It might be noted that, by 1885, Theodor Krausch was advertising his own machine, 'Krausch's Standard Ice and Refrigeration Apparatus, for Breweries, Malt Houses, Etc.', providing a list of 13 customers in St. Louis and Ferguson, MO; Milwaukee, WI; Omaha, NE; and Alton, Belleville, and Rock Island, IL. *The Western Brewer*, X, 1, January 1885, p.198.

70. *The Western Brewer* IX, 10 (October 1884): 1726. The blending of interests from the Empire, Boyle, and other refrigeration companies could be seen in Jungenfeld's position as vice-president of Consolidated, and J. Koenigsberg's as assistant secretary. Hermann Rossbach, superintendent of refrigerating machinery department, had formerly been at the De La Vergne & Empire Refrigerating Companies, and Victor H. Becker, superintendent of the ice-making machine department, had formerly been with the Boyle Ice Machine Co. Initially, at least, both Boyle and Empire machines were available through Consolidated, but numbers of later brewery projects featured specifically Consolidated machines. Shares in both Empire and Consolidated figure throughout the accounting of the estate in the Probate records of Edmund Jungenfeld.

71. Plavchan, R.J. (1976) *op. cit.* pp.56-57. Ice depots far from the brewery were a means of replenishing the ice in refrigerated railroad cars used to ship bottled beer over long distances.

72. *The Western Brewer*. V, 10, October 1880, p.1026.

73. *ibid.*, VI, 3, March 1881, p.306.

74. *ibid.*, VI, 10, October 1881, p.1322. It should be pointed out that the Ph. Best Brewing Co. (later Pabst), Milwaukee, placed a similar order with the Boyle firm in the same month, also intending to cool all of its fermenting and storage cellars artificially, as reported in *The Western Brewer*. VI, 9, September 1881, p.1126.

75. 'Great Breweries of the World: The Anheuser-Busch Brewing Association of St. Louis, Mo.', *The Western Brewer*. VIII, 4, April 1883, p.643.

76. 'The Anheuser-Busch Refrigerating Apparatus, St. Louis', *The Western Brewer*. VII, 1, January 1882, p.56 + Supplemental illustrations, which also ignore the contemporary Best (Pabst) project.

77. When *The Western Brewer* announced the contract between Ph. Best and the Boyle Ice Machine Co. (VI, 9, September 1881, p.1126), it tried to convey the magnitude of the event by stating that 'the cubical contents of the beer storage and fermenting rooms to be cooled by the machinery included in their order amount to over 1,600,000 cubic feet; that to transport the machinery and all of its connections, exclusive of steam boilers, will require at least 20 freight cars; and that the contract price for the machinery completed and in operation amounts to \$80,000'. According to <http://www.measuringworth.com/uscompare/relativevalue.php>, the value of that \$80,000 in 2012 dollars would range between \$171 and \$108 million, a hefty investment, clearly.

78. The '50-ton' description meant that each machine was capable of creating the same amount of cold that 50 tons of ice could in a 24-hour period.

79. 'Great Breweries of the World' (1883) *op. cit.* p.643.

80. Yeakle Sr., M.M. (1889) *op. cit.* p.220.

81. Plavchan, R.J. (1976) *op. cit.* p.59. *The Western Brewer*. XI, 11, November 1886, p.2390 + Supplemental Illustration, focused on new buildings, including a new Refrigerating Machine House near the corner of 9<sup>th</sup> and Arsenal Streets, erected for Anheuser-Busch by E. Jungenfeld & Co., by this time composed primarily of Widmann, Walsh, and Boisselier.

82. 'A St. Louis Refrigerating Plant', *The Western Brewer*. XVIII, 1, January 1893, p.88, discussing in particular the further enlargement of the Refrigerating Machine House along Arsenal Street opposite 9<sup>th</sup> Street. It was also pointed out that, while the buildings noted here were often new buildings, the architects were carrying out the original design for the whole complex at Anheuser-Busch, created by Edmund Jungenfeld.

83. Anheuser-Busch Brewing Association, (1889) 'A Simple Story of the Origin and Unprecedented Growth of the Anheuser-Busch Brewing Association', Pamphlet, St. Louis:

By the author, p.4.

84. 'Brewery Building in St. Louis, Premises and Plant of the Wainwright Brewery Co.'s New Brewery', *The Western Brewer*. IX, 5, May 1884, p.829.

85. *The Western Brewer*. IX, 11, November 1884, p.1847.

86. 'The Late Edmund Jungenfeld', *The Western Brewer*. X, 1, January 1885, p.86. In good 19<sup>th</sup>-century fashion, the obituary was thorough in its report of the cause of death: 'His complaint was inflammation of the bowels, superinduced by a neglected cold, and the direct cause of his death was blood poisoning, the result of inflammation of the bowels'. His death came after a three-month illness, the final two weeks in bed.

87. *ibid*.

88. *ibid*. In addition, Probate records for Edmund Jungenfeld's estate (Colls. 90 & 91) provide insight into the carrying on of his firm following his death on 20 December 1884. Within a few days, Jungenfeld's executors drew up an agreement with his three major assistants, Widmann, Walsh, and Boisselier, whose signatures were notarized on 26 December 1884, agreeing that they would purchase the firm at its appraised value (\$2273.25, which today might equal about \$538,000, according to <http://www.measuringworth.com/uscompare/relativevalue.php>, assuming that the price would equate with what this site calls 'economic status value'). The three men also agreed to continue the firm under the title E. Jungenfeld & Co. for a period of nine years, during which one-third of the net profits of the firm would be paid to the estate for distribution to Jungenfeld's three heirs - his two children and his housekeeper. As an extraneous detail of interest, not quite four years later, the housekeeper, Sophie Sander, married Frederick Widmann, see Marquis, A.N. (1912) *op. cit.* p.635.

89. In St. Louis Jungenfeld's clients included, in addition to Anheuser-Busch, the breweries of A. Griesedieck & Co., Brinckwirth, Griesedieck & Nolker (Lafayette Brewery), Casper Koehler (Excelsior Brewery), Charles G. Stifel (City Brewery), Henry Grone & Co., Joseph Schnaider, Feuerbacher & Schlossstein (Green Tree Brewery), Wm. J. Lemp, Julius Winkelmeyer Brewing Association, J. F. Heidbreder (Liberty Brewery), Samuel Wainwright & Co., Klausmann Brewing Co., Heim Bros. Brewing Co. (East St. Louis, IL); the malting firms of Tinker & Smith and Chas. Ehlerman & Co., the American Wine Co., and the chemical works of G. Mallinckrodt & Co. Jungenfeld's clients outside St. Louis included Memphis (TN) Brewing Co., Decatur (IL) City Brewery, Metz Bros. (Omaha, NE), Michael Brand (Chicago, IL), F. D. Redeke (Kankakee, IL), Muehlebach Bros. (Kansas City, MO), Bergner & Engel Brewing Co. (Philadelphia, PA), N. Seitz (Brooklyn, NY), Nashville (TN) Brewing Co., G.

Luscher (Frankfort, KY), C. Windisch & Co. (Covington, KY), Becker & Co. (Lancaster, OH), Kentucky Malting Co. (Louisville, KY), Albert Ziegele (Buffalo, NY), L. Franz & Bro. (Jefferson City, MO), Schmidt & Hoffman (Cleveland, OH), F. Kump (Kansas City, MO), Western Brewing Co. (Belleville, IL), D. G. Yuengling, Jr. (New York, NY), Waco Ice Machine Co. (Waco, TX), Geo. Wagner's Sons (Jefferson City, MO), Willow Springs Distilling Co. (Omaha, NE), Prospect Brewery (Philadelphia, PA), Southern Brewing Co. (New Orleans, LA), D. G. Yuengling & Sons (Pottsville, PA), Krug (Omaha, NE), Schoenhofen Brewing Co. (Chicago, IL), Storz & Iler (Omaha, NE), John Wieland (San Francisco, CA). These lists were compiled from *The Western Brewer*. (1879-1884), *passim*, and from Jungenfeld's Probate Records, online, mentioned previously.

90. 'Great Breweries of the World' (1879) *op. cit.* p.1092.

91. *Gould's St. Louis Directory*, published annually allows the tracking of all of these men, not only in terms of where they lived, but also where they worked.

92. Marquis, A.N. (1912) *op. cit.* p.637.

93. Lang, B. (1985) Landmarks Assn. of St. Louis, Inc., 'Winkelmeyer Building', National Register of Historic Places Nomination Form, <http://www.dnr.mo.gov/shpo/nps-nr/85001500.pdf> (accessed 11/3/2008).

94. This range of dates is cited in 'Parkview, Noted Architects and Architecture', <http://stlouis.missouri.org/parkview/parchitect.htm> (accessed 10/29/08), and under 'Janssen', in the Architects file, St. Louis Public Library.

95. *The Western Brewer*. VI, 11, November 1881, p.1450.

96. *ibid.*, VII, 5 (May 1882) p.728.

97. 'Brewing in Mexico', *The Western Brewer*. XVI, 12, December 1891, p.2838.

98. Lang, B. (1985) *op. cit.* Sect. 8, p.1.

99. Savage, C.C. (1987) *Architecture of the Private Streets of St. Louis, the Architects and the Houses They Designed*. Columbia, MO: University of Missouri Press, pp.116-117. Wilhelmi was a natural part of the world of St. Louis brewing, at least once he married Emelie Stifel in 1882, see Marquis, A.N. (1912) *op. cit.* p.637. She was the daughter of Christoph Adam Stifel (1826-1904), and Christoph was the brother of Carl Gottfried Stifel (of the C.G. Stifel City Brewery, St. Louis) and Christina Stifel Winkelmeyer, widow of St. Louis brewer Julius Winkelmeyer. (Records of Hillcrest Abbey Crematory and Mausoleum, St. Louis, per <http://www.findagrave.com/cgi-bin/fg.cgi?page=gr&GRid=48975942>, and [http://records.ancestry.com/Wilhelm\\_Friedrich\\_Stifel\\_records.ashx?pid=49322264](http://records.ancestry.com/Wilhelm_Friedrich_Stifel_records.ashx?pid=49322264), both accessed 8/2/2013).

100. 'Parkview, Noted Architects and Architecture',

<http://stlouis.missouri.org/parkview/parchitect.htm> (accessed 10/29/08).

101. Anon. (1891) *Industrial Chicago: The Building Interests*. Chicago: The Goodspeed Publishing Company, I, p.631.

102. *ibid.*

103. Edmund Jungenfeld Probate Records, Collection 39 (online), handwritten bill from Wilh. Griesser to the estate of E. Jungenfeld; an affidavit, signed by Griesser and notarized, records his receipt of payment on 5 January, 1885. Another record in Collection 30, dated 10 June 1885, reinforces Griesser's new status as a Chicogoan - he submitted a claim for the costs of travel from Chicago to St. Louis and back and for services rendered in attending the settling of a legal case between E. Jungenfeld & Co. and the Wainwright Brewery Co., St. Louis.

104. *The Western Brewer*. X, 3, March 1885, p.455. Separately, in the same March issue (p.479), the journal noted 'Mr. Will Griesser, brewers' architect and engineer, formerly with E. Jungenfeld, St. Louis, has commenced business for himself at 206 W. 12<sup>th</sup> Street, Chicago'.

105. *The Western Brewer*. X, 11, November 1885, p.2206.

106. For example, in *The Western Brewer*. XI, 9, September 1886, p.2007, Wilhelm Griesser's half-page ad featured illustrations of his 'improved conveyor', 'Griesser's Patent Improved Elevator' (a bucket elevator/conveyor), 'Griesser's Mash Tub Valve', and 'Griesser's Steep Tank Valve'.

107. 'Design for a Model Lager Beer Brewery', *The Western Brewer*. XI, 9, September 1886, p.1922, + supplemental illustration. The journal editors also claimed to have studied Griesser's plans carefully, stating, 'we are much pleased at their utility and general adaptability. All the waste water is concentrated and reused for the pumps and other purposes. The ventilation provided for the malt house and cellars is scientific and according to the latest ideas and discoveries. All material enters and all shipments go out in front of the office, so that one set of clerks control the whole'. They also noted Griesser's recent improvements in steep tank and mash tub valves and conveyors. Nothing directly discussed the architectural style here, aside from the implication that it was 'imposing', but the approach to design seems an outgrowth of the direction in which Jungenfeld was moving in his 1879 brew house at Anheuser-Busch.

108. *The Western Brewer*. XIII, 4, April 1888, p.809.

109. *ibid.*, XV, 11, November 1890, p.2485.

110. August Maritzen, like Wilhelm Griesser, went on to a successful solo career. A report from September 1891 stated that he '... is very busy preparing plans and specifications, and supervising constructive work in his line. He has eighteen

draughtsmen at work, and has breweries in various stages of construction in Boston, Mexico, British Columbia, and in more than half the states of the Union. Mr. Maritzen has long been known as one of the most able architects in his special line in this country, and his enormous business shows the brewing fraternity's appreciation of his abilities and sound judgment'. *The Western Brewer*. XVI, 9, September 1891, p.2097.

111. *The Western Brewer*. XIX, 12, December 1894, p.2432, announced the name change for Griesser's firm, but the ad shown in Fig. 32 precedes that announcement by seven months. Included in this ad are images of Gerhard Lang's Park Brewery, Buffalo, NY; the brewery of F.X. Haser, Chester, PA; the Monarch Brewing Co., Chicago, IL; Jacob Kuebelier & Co., Sandusky, OH; and the Gottfried Brewing & Malting Plant, Chicago, IL.

112. *The Western Brewer*. XX, 10, October 1895, p.2128, where this school was no more clearly identified, but where the value of professional training in the Old Country was apparent. This kind of training more than once, then, ties some younger brewery architects to their elders, and to the pioneers of brewery architecture in America.

113. *ibid.*, XXV, 1, January 1900, p.12, and XXIII, 9, September 1898, p.1605.

114. *ibid.*, XXVII, 6, June 1902, p.236f.

115. *ibid.*, XXIX, 12, December 1904, p.535, and XXX, 2, February 1905, p.82.

116. *ibid.*, XXXIII, 9, September 1908, p.461, and XXXIV, 9, September 1909, p.455.

117. Obituary for Richard Griesser, (1938-1939) *Illinois Society of Architects Monthly Bulletin*. XXIII, Nos. 6-7, December - January, p.8. This father/son nature of the firm is never presented as such in other records found thus far, but it was apparently the case, and an unusual one in lasting some 15 years. Occasional other examples of established brewery architects adding '& Son' to a firm name did occur elsewhere, but not very commonly. One example was a single project by 'Lehle & Son', likely in an attempt by an even more prolific brewery architect, Louis Lehle (headquartered in Chicago and once the partner of F. W. Wolf), to bring his son into his office; it appears only once, in *The Western Brewer*. XXVII, 11, November 1902, p.431. Another instance came in the appearance of 'Fred Rautert & Son', by which Rautert, a busy architect who had worked since 1892 in Chicago partnerships and on his own, apparently added his son to his firm in 1904, when they designed the new brewery for the Waverly (IA) Brewing Co., see *The Western Brewer*. XXXIX, 8, August 1904, p.353, and XXXIX, 9, September 1904, p.389). In 1907, Rautert & Son were jointly making

improvements on the refrigerating plant at the Excelsior Brewery, Sterling, IL, which they also operated, see *The Western Brewer*. XXXII, 3, March 1907, p.134, until local prohibition laws closed it about 1910. Sadly, Rautert, Sr. died by his own hand 15 April 1914, apparently as a result of that closing and accompanying business reverses, see *The Western Brewer*. XLII, 5, May 1914, p.211.

118. 'Park Brewing Co., Winona, Minn.', *The Western Brewer*. XXIX, 5, (May 1904): 204; for Ohio Union, *The Western Brewer*. XXIX, 8, August 1904, p.363; for Oshkosh Brewing Co., *The Western Brewer*. XXXVII, 5, November 1911, p.317.

119. This judgment relies simply on the growing infrequency of reports of both Griessers' projects in *The Western Brewer* as the 1910s went on.

120. *The Western Brewer*. X, 10, October 1885, p.1993 + illustrated supplement, and X, 12, (December 1885, pp.2430-2431+illustrated supplement.

121. *ibid.*, XI, 11, November 1886, p.2390 + Supplemental illustrations.

122. Edmund Jungenfeld, Probate Records, Collections 88, 90, and 5, online. (These collections of records are not necessarily numbered in any clear chronological order, but seem simply to be groups of four or five fairly randomly digitized items per collection.)

123. 'Brewing in the South', *The Western Brewer*. XIII, 5, May 1888, pp.1538-39.

124. My date of 1891-93 covers the widest possibilities, since sources do not agree. *The Western Brewer*. XVIII, 6, June 1893, p.1294, discussed the brew house as just completed, so presumably 1893. The company itself, in (1993) 'The History of Anheuser-Busch Companies - A Fact Sheet', A-B Companies, Inc., p.13, stated that the brew house was constructed in 1891-2, perhaps taking its cue from the fact that each of those two years is inscribed at the top of one of the two major facades of the building.

125. *ibid.*

126. 'National Historic Landmarks Survey, National Park Service, Listing of National Historic Landmarks by State: Missouri', <http://www.nps.gov/nhl/designations/Lists/MO01.pdf>, accessed 8/7/2013.

127. *The Western Brewer*. VIII, 9, September 1883, p.1612, announced the new brewery for Wainwright, necessitated by the sale of the entire premises of the S. Wainwright Brewery Co. to the St. Louis and San Francisco Railroad. Completion of the project was extensively discussed and illustrated in 'Brewery Building in St. Louis, Premises and Plant of the Wainwright Brewery Co.'s New Brewery', *The Western Brewer*. IX, 5, May 1884, p.830.

128. *ibid.*, XVII, 10, October 1892, p.2246.

129. All of these projects were noted, some in great detail in *The Western Brewer*: 'Brewing in Tennessee', XVII, 8, August 1892, pp.1778-1779; XVII, 9, September 1892, pp.2014-2015; 'Brewing in Omaha, Neb.', XVII, 12, December 1892, pp.2727-2729; 'Brewing in Houston, Tex.', XVIII, 10, October 1893, pp.2246-2247.

130. 'Brewing in St. Louis', *The Western Brewer*. XVII, 10, October 1892, pp.2256-2257; 'A St. Louis Refrigerating Plant', *The Western Brewer*. XVIII, 1, January 1893, pp.88-89.

131. *ibid.*, XVIII, 7, July 1893, p.1539. I have yet to find anyone, including now retired Anheuser-Busch Archivist, William Vollmar, who knows what became of this model. It might be noted that, for the same event, the Pabst Brewing Co., Milwaukee, also had a model of its enormous brewery created for display; it only covered about 13' square, but was entirely plated in 24 carat gold, see 'The World's Fair', *The Western Brewer*. XVIII, 8, August 1893, pp.1779-80.

132. E. Jungenfeld and Co. (1895) *Portfolio of Breweries and Kindred Plants Designed and Erected by E. Jungenfeld & Co.*, St. Louis. St. Louis.

133. Announcement of the publication of Otto C. Wolf's first catalog appeared in *The Western Brewer*. XVI, 6, June 1891, p.1365. Maritzen's *Illustrated Catalogue of Architectural and Engineering Work Designed by August Maritzen, Architect and Engineer*. Chicago: August Maritzen, was noted in *The Western Brewer*. XVII, 12, December 1892, p.2745; some of the work shown derived from his time with Griesser, but much of it was his own; a second edition came out in 1893-94. Fred W. Wolf's catalog was noted in *The Western Brewer*. XXIV, 12, December 1899, p.516. C.F. Terney's (1900) *Illustrated Catalogue of Some of the Architecture and Engineering Work Appertaining Especially of Brewery Construction as Designed and Executed by C.F. Terney, Engineer and Architect*. New York, was re-released in May 1910, with a typescript insert following title page, indicating that Terney had moved his main business office from New York and Buffalo to Washington, D.C. The second of Otto C. Wolf's catalogs was his (1906) *Breweries and Allied or Auxiliary Buildings*. Philadelphia: G.M.S. Armstrong.

134. *The Western Brewer*. XXIII, 1, January 1898, pp.7, 102. This was well after the nine years for which they had agreed to use Jungenfeld's name, and supposedly, the change was motivated by their frustration with continually having to explain why there was no Jungenfeld in their office.

135. Savage, C.C. (1987) *op. cit.* p.65. I have little additional information on these residential projects, aside from Savage's mention of a house for grain merchant William D. Orthwein at 15 Portland Place, St. Louis.

136. *The Western Brewer*. XXIII, 11, November 1898, p.1988; Wolf-Linde Collection, Chicago Historical Society; Interco Archives, St. Louis (seen 1989); National Register of Historic Places Registration Form for North Riverfront Industrial Historic District, St. Louis, MO, December 19, 2002, via <http://www.mo.gov/shpo/nps-nr/03000320.pdf> (accessed 11/3/2008); *The Western Brewer*. XXV, 4, April 1900, p.152.

137. *The Western Brewer*. XXV, 1, January 1900, pp.23-32 + Supplement.

138. Kargau, E. (1902) *Mercantile, Industrial & Professional St. Louis*. St. Louis: Nixon-Jones Printing Company, pp.336-337.

139. Hunter, J.K. (1988) *Westmoreland and Portland Places: The Architecture of America's Premier Private Streets, 1888-1988*. Columbia: Univ. of MO Press, p.188.

140. 'Obituary: Adolphus Busch', *The Western Brewer*. XLII, 1, January 1914, p.13. With the death of Adolphus, his son, August A. Busch, became president of the company. 'He inherited the difficult war years and, with them, the formidable task of guiding the company successfully through the prohibition era that followed the war'. 'Anheuser-Busch Has Achieved a World's Record', *St. Louis Commerce*. 30, July 1956, p.18.

141. *The Western Brewer*. XXXVII, 4, October 1911, p.231; photo in XXXVII, 5, November 1911, n.p. See note 1 for the publication of the text of Widmann's talk.

142. The web site 'MeasuringWorth' (<http://www.measuring-worth.com>, accessed 8/8/13) indicates that, as a 'Project' the \$2.5 million cost of the Bevo plant in 1917 would today be the equivalent of \$30.5 million as 'historic opportunity cost' (cost relative to the cost index of all output in the economy), \$159 million to \$238 million as 'labor cost' (i.e., cost in terms of the relative wages of unskilled workers vs. production workers who might have built it), or \$657 million in 'economy cost' (the cost measured as a relative share of the output of the economy overall). However one looks at the Bevo plant, it was an expensive undertaking.

143. *The Western Brewer*. XLVIII, 2, February 1917, pp.55-56.

144. Plavchan, R.J. (1976) op. cit. p.133.

145. *ibid.*, pp.159-160, where Plavchan indicates that the Bevo plant cost \$10 million. One might argue that the scale of the building was overkill, given the economic issues of the period, but that underscores, for me, the notion that the brewing firm was, in fact, making a statement here.

146. Cincinnati Federal Writers' Project of the Works Progress Administration in Ohio (1938) *They Built a City: 150*

*Years of Industrial Cincinnati*. Cincinnati: The Cincinnati Post, p.136; and (1993) 'The History of Anheuser-Busch Companies - A Fact Sheet', n.p. In her Appendix, Gettelman, N.M. (1995) *A History of the A. Gettelman Brewing Co.* Milwaukee: Procrustes Press, reproduces a selection of documents related to the war effort and its impact on brewing.

147. For example, careful reading of *The Western Brewer* shows that, by 1905 and beyond, it was apparent that, while general coverage of new buildings at breweries was still a point of interest in such trade journals, it was also clear that there were now relatively few references to architects and even fewer pictorial entries. Frequently, building projects were reported without attribution to architects, but only identified with a brewing company. When a given designer had worked extensively in the past with a particular brewery, it is tempting to wonder if the same architect might still be involved in these later projects, but often such cannot be proved, at least by what the journal says of the projects. I am not aware of any statement of changes in the policies or approaches of *The Western Brewer*, but compared to earlier times, that journal, once so proud of its pictorial reporting, definitely had changed its ways.

148. Stevens, W. B. (1921) op. cit., Vol. 4, p.440.

149. In this case, Richard Griesser was hired around 1932 for the then-unusual project to convert the former Savage Tire Factory, San Diego, CA, into a brewery, perhaps because in 1912, before Prohibition, he had designed the brewery of the Bay City Brewing Co. (later the Mission Brewing Co.) in the same city. *The Western Brewer*. XXVIX, 6, December 1912, p.285; Kathleen Wheatley, 'Savage Tire Factory (Aztec Brewing Company)', HAER No. CA-79, Historic American Engineering Record, National Park Service, Department of the Interior, Washington, D.C., 1987 (housed at the Library of Congress).

150. Neglect after long abandonment is what led to the demolition of Cincinnati's Windisch-Muhlhauser Lion Brewery shown in Fig. 6. Happily, there has been something of a rebirth of interest in pre-Prohibition breweries, at least in some places (Cincinnati, for example), so that there are redevelopment plans in the offing or carried through for a number of former breweries, whether or not the new uses have anything to do with the old. The preservation of these structures, when possible and not too intrusive, is a very positive thing. Sadly, there are still significant and ongoing losses of once-major structures; the wonderful brew house of the former Schlitz Brewing Co. in Milwaukee, WI, was under demolition as I wrote this.