

Tools: Building Labor History into American Architecture

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Architectural practice has become an increasingly relevant topic in the history of architecture. This unfolding field has most notably evolved through studies of architects' tools and graphic representations, through the changing curricula of architectural schools, to the demographic constitution of the profession, and to the personal training of specific designers.¹ Yet, this collective line of inquiry provides insight well beyond how training and professional procedures shape form. The study of practice also traces how the social conceptions and biases held by design practitioners inform their dealings with other professional groups and, ultimately, how these working relationships constitute the production process in building.

The practice of architecture, however, is not limited only to architects. Architecture, if defined as the production of built form, is as reliant on the knowledge and work of the whole enterprise of building and its recipients as it: this would include builders, engineers, realtors, and (most relevantly for this paper) building labor to name a very few. Moreover, if we can also define architecture as the interpretation of built form, then we should lend an ear to the voices of these various professionals to better understand how they understood their roles, how they represented these roles, and what effect, if any, these roles had on the building practices and the ultimate built form. This paper reviews one such interpretation of professional roles and industrial pursuits.

MAKING HISTORY

The stories of other professional groups in building – let alone the history of their relationship with architects – have received scant attention from historians or architectural scholars. Yet, one such group poses potentially constructive directions: building trade labor. Similar to their counterparts in architectural history, few labor scholars have studied construction practices. The exceptions to this have generally focused on industrial organizing and unionizing in this industry rather than

professional identification and skill.² They have also refrained from exploring trades that presented dramatic changes in the materials and methods of design and construction, like steel.

All of these oversights, of course, reproduce notions of building workers' mysterious natures.³ Anecdotal sources suggest a conflicted understanding in the history of architects' labor relations: the romanticizing of craft skill, protesting of labor organizing, and disregarding labor's influence on built form all mark the historical record. Architects' perceptions of other groups whose work shapes and is shaped by architectural production, then, both reflects their own history and sheds light on their own professional identity.

In the particular case of building labor at the turn of the nineteenth century, these perceptions were inherently connected to architects' divergent ideas about the physicality of construction versus the intellectualism of design. Notions of class and gender with regard to physical work shaped this professional relationship, while nationality played a clear role in early discussions among the building "professions," i.e., designing architects and engineers. While some designers praised builders and tradesmen as skilled craftsmen and even saw labor unions as modern guilds, other architects painted a less favorable picture of their on-site colleagues. Engineers and architects – who considered their creative work to be the center of building enterprises – regularly described building trades as crass, opportunistic, and uneducated. Tradesmen and contractors increasingly referred to designers as unrealistic, affected, and nuisances to their nuts-and-bolts work.

These stereotypes played themselves out, most significantly, in discussions of technical competency and skill. While innovations in knowledge and practice were central to discussions of the modern built environments, they were also critical to the formation of the modern building industry in many ways. Building groups consolidated themselves around issues of knowledge and skill at the same time as they determined their

positions on numerous national issues. These included labor syndicalization, Taylorized production systems, nationalist aesthetic styles, and Progressive social reform. The professionalization of these groups, then, was simultaneous to the development of modern construction materials and methods, broader changes in architectural form, and immense urban growth.

For architects of the time, the issue of technical skill was a particularly sore one. From the 1880s to the Depression, construction innovations revolutionized both design and designers; technological change would come as both a threat and a blessing for their position – one which was already undergoing significant change. The most publicized example of the increased importance attributed to technological skill in architectural production came in a cartoon; in its first newsletter for 1921, the Associated General Contractors of America (AGC) included a drawing that glorified past construction feats and depicted all industrial groups as part of the larger enterprise of building. [Figure 1]. Visually, each group was one supporting stone of an arch. While the AGC generously included many industrial groups within this assemblage, it was more strategic about its underlying message.

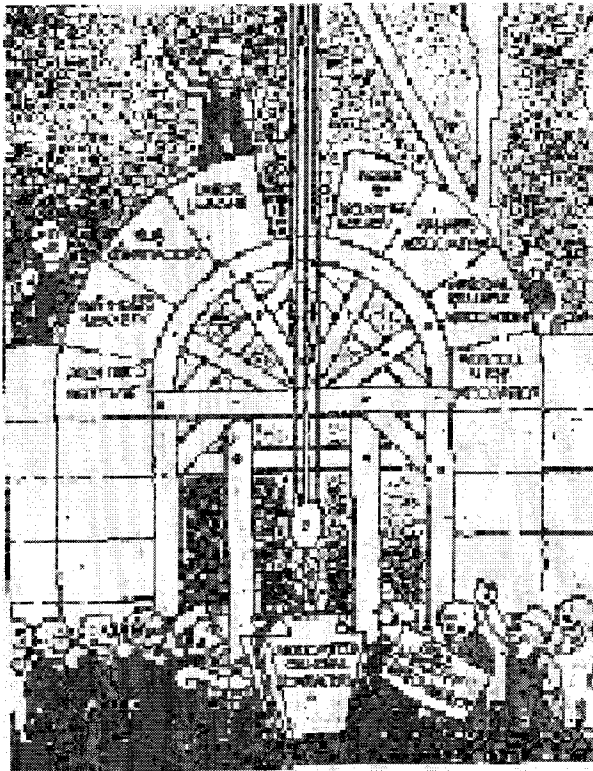


Fig. 1. AGC Cartoon [Reprinted in *The American Architect* 34 (1921): p. 76].

The AGC placed itself in the keystone of the “Arch of Construction.” The names of trades, materials and products associations, and subcontractors were scattered on the remaining stones. Interestingly, organized labor was depicted immediately to the left of the keystone despite having had bloody

battles with builders. Placed in the lowest left-hand side of the arch, however, was the AGC’s counterpart for the architectural profession: the “Architects’ Institute.” These placements were not arbitrary, nor were they taken as such by architects. The next issue of *Architectural Forum* reprinted the AGC cartoon with a poem by architect Ernest O. Bostrom titled “The Misplaced Keystone”:

Public thought – / Can’t be bought / Should be moulded
[sic] as it ought.

Off we must – / Shake the dust / Ere the very brain cells
rust.

Am I right? – / Then let’s fight / That which we believe a
slight...

Be not slow – / We will show / Where the key should really
go.

And its name – / Borne by Fame / Shall be classed with
Art again.⁴

For months afterwards, architects remembered this event not just as a slight, but as an attack on their very professional existence. The following fall, the editors printed an article titled “Eliminating the Architect?” defending their trade from the other professions and from the material innovations that had spurred such competition.⁵ Some architects of the time took up the cause by dismissing the technological changes as entirely irrelevant to “architecture;” in response to a proposal for technical training among architects, Charles Moore bluntly stated, “The present use of iron and steel...comes of no needs of architecture. It is destructive of architecture if not kept apart from it.”⁶

Of course, there were many notable architects who became well-versed in the new techniques. What was truly at stake for either the technologically savvy Modernists or the traditionalists, however, was their sense of architects’ control over building. Looking at the professional identifications of other groups in the same industry, however, sheds light on how these identifications developed in contrast to architects and how these would be used to garner further control over practices in building production.

Just as architects disagreed over the role that technology would have in the profession’s significance for the entire architectural enterprise, they assigned technological categories to other building professionals’ work. For example, some designers began questioning why production paces were “set by the workman and his tools” rather than the by “science, modern mechanical inventions, the use of mechanical power, or the process of quantity production.”⁷ Still others argued that that the tradesman would “[retain] his position as the central figure in many great sectors of the system where his knowledge and his skill are quite as indispensable as is the technological knowledge of the scientist and the engineer.”

In fact, all of the building professions, *especially* building labor, would fight in this technologically-charged battle for authority. Looking at other professions' socialization and self-perception sheds much-needed light on the contested terrain in which architecture was constructed.

A HISTORY IN THE MAKING

Among the actual laborers, professional identification took many previously unknown forms – each of which was partly, if not totally, negotiated through notions of technical skill and competence. Building professions and trades institutionalized their training in schooling and apprenticeships. They routinized their daily work through contractual legalities, jurisdictional guidelines, and organizational agreements. Finally, they also began forming professional identities and working ideologies through formal associations, regular meetings, and public announcements. For structural steel building workers (commonly referred to as “bridgemen”), technical skill and competence would be central to their professional identity. Just as importantly, they wished to make this skill known to the designers – both engineers and architects – whose decisions on design would be made with an understanding of each group's technical capacity.

During this time, public perceptions of each other's professional skill played a major role in determining these understandings. Among the images that both the general public and the building professions viewed with regard to building steelworkers were those created by Lewis Hine, whose photo series entitled “The Empire State Photographs” involved his scaling the skeleton of what was to be the world's tallest structure to record the daring movement of the structural steel construction crew.³

Popular cultural productions like these spoke to a broader and very real debate that was occurring in the actual building industry and over the built environment. Each of the various groups affiliated with building projects actively sought to define itself, particularly in contrast to others. This need was urgently felt not only because the nation's cities were physically grow at such a rapid rate, but, more importantly, because the building industry was seen as a central determinant of that growth. Relationships between these groups, particularly with architects, and self-perceptions of technical skill in design and construction were critical to that identification.

Such popular images of the building trades were held throughout skyscraper development, and were particularly held for those workers that toiled over the “magic cauldron” to build cities with a simple “rattattat” – that is, structural steel workers.” As early as the turn of the century, newspapers ran features on the marvels of ironworking and its contribution to American strength; the Chicago American ran an editorial asking “Did you ever give a thought to these men? They build

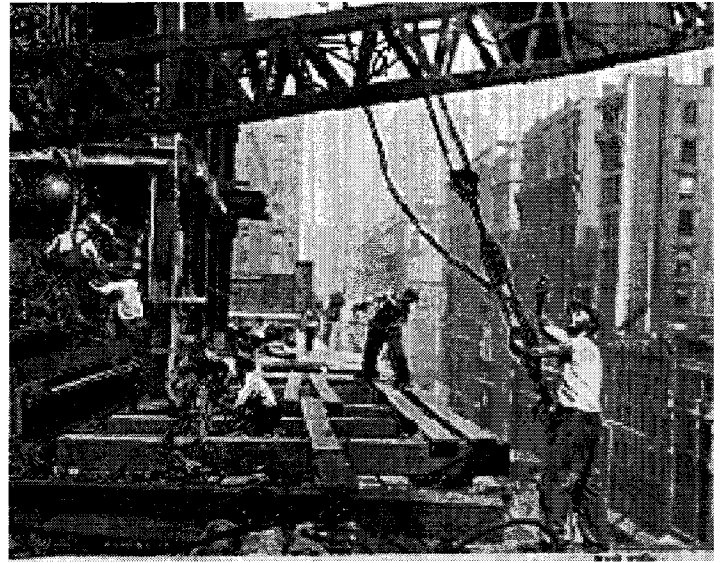


Fig. 1. A Hoisting Gang at Work on 34th Street Elevation [Hine (1930): New York Public Library, Javitz Collection].

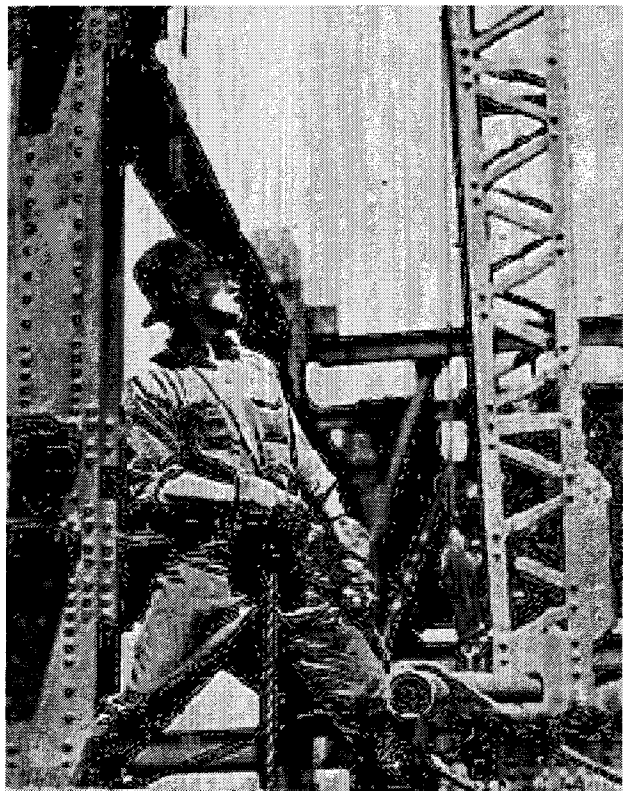


Fig. 2. A Derrick Man [Hine (1930): New York Public Library, Javitz Collection].

our skyscrapers, bridges, and trestle work. They fasten together the steel beam and girders that form the bones and muscles of our high buildings. And yet these structural iron workers risk their lives every week-day in the year for their country's sake... When a nation is dead and buried, it is not remembered as much by its talking, or eating, or voting, or buying and selling,

as by its building.”¹⁰ In a 1909 essay published in journals and newspapers across the country, writer Ernest Poole penned the name which would become associated with – and with which bridgemen would identify – the tradesmen.¹¹ A sample of this photographic and literary essay included:

Rough pioneers are these men of steel, pushing each year their frontier line up toward the clouds. Wanderers, living for their jobs alone. Reckless, generous, cool-headed, brave, shaken only by that grim power of Fate, living their lives out fast and free—the cowboys of the skies.



Fig. 3. “Icarus, the Sky Boy” [Hine (1930): New York Public Library, Javitz Collection].

As a “skilled” trade, bridgemen were generally open to changes in both how they built and what they built. In contrast to many other construction labor trades, then, structural steel workers were given much freedom in setting their practices. This was reflected in the popular and industrial images of ironworkers performing their “magic” above the physical heads of urban residents and the building professionals’ figurative ones. Bridgemen even suggested that their tremendous ability to manipulate steel beams and hot rivets at dizzying heights might be biologically innate, or “scientific.”¹² So, for them, professional pride, technological independence, and transformations in architectural design were all connected pursuits.

Further, this technical independence had been reproduced throughout the bridgemen’s history.

The first ironworkers were seen in the mid-nineteenth century with the earliest iron structures. While some came from construction backgrounds, the majority had worked in iron foundries as blacksmiths and took their knowledge of and experience with metalworking outdoors. As such, these blacksmiths were first known by a variety of terms, like “bridge carpenters,” “housesmiths,” “architectural ironworkers,” and

most commonly, “bridgemen.”¹³ The reliance on their technical knowledge was apparent from the earliest stages of iron construction, and would be furthered during the building of the first iron and steel skeleton structures in the 1880s. By that time, bridgemen were among the highest paid of the building tradesmen both because of their skill and the great hazards involved in their work. This compensation would continue in the building trades well into the next century and even up to the present.¹⁴ Indeed, ironworkers’ various crafts officially constituted a professional vocation by the 1910s.¹⁵ By that time, they had instituted apprenticeship programs.¹⁶

Yet, ironworkers’ relations with both their employers and with the other building trades determined their concerns over maintaining control of their work as much as the conceptions of their own work, particularly as that was determined through tools and practices. These relations would jointly shape the stuff of their work, and were apparent at their very first organizing attempts. It was, in fact, soon after the first structural metal building had been erected that bridgemen form supportive associations. As one early Chicago ironworker reported, “In the early 80s, it was evident to some of the men who followed bridge building for a livelihood, that iron and steel would, in a short time, replace wood and stone in the construction of bridges and buildings, and in order to protect themselves and their vocation, some band of unity or mutual understanding among the men of this industry must be brought about.”¹⁷

New York’s German-Speaking Locksmith and Railingsmakers Union was formed in 1886, changing its name in 1890 (and expanding its work jurisdictions and ethnic composition) to the Architectural Iron Workers’ Progressive Union, only to be brought down in a strike one year later.¹⁸ In Chicago of that year, however, three separate ironworkers’ support groups merged to form the first structural workers’ syndicate, the Bridge and Construction Men’s Union.¹⁹ They, too, were broken up by the Iron League of Chicago.²⁰ In 1892, the bridgemen reformed and merged with Chicago’s architectural and ornamental ironworkers (who had been organizing separately and had scabbed during the bridgemen’s strike) to create the 2700-member Bridge and Structural Iron Workers.

By these years, ironworkers had already disassociated themselves from the workers who made the iron and steel members through identity and work practices – that is, bridgemen’s skills were developing with the new structural techniques to the point that their previous training was no longer relevant. This was reflected in their organizing efforts which went to great pains to join all construction workers affiliated with on-site metal construction under their jurisdictional lines.²¹ The conflict in defining the technological boundaries of steel structural work by both steel manufacturers and contractors (arguing that steel construction included both structural steel manufacturing and erection) and ironworkers (who felt that it was only on-site construction) would even snowball into one of the most

prolonged and among the most violent labor struggles in US history.²²

Since their work practices, tools, and technological knowledge lay between metalworking and construction, further, they also fought with building trades. Indeed, struggles with other construction workers – particularly with carpenters – were their greatest battles within the AFL. As the newcomers to an old professional tradition, ironworkers were regularly suspect in the building industry. The presumptions over their technical skill and the pride they held towards their fashionable materials did not help their welcome. Even before affiliating with the AFL, the Chicago bridgemen's local withdrew from the city's Building Trades Council in 1900 during a major all-union strike.²³ Begun by the carpenters for increased wages, every building trade was called on to strike – some in sympathy, some for similar reasons. The bridgemen not only colluded with the city's steel constructors to form a secret agreement, but withdrew from the Council since it considered itself to be among “the elite of the skilled workers in the building trades.”²⁴

Indeed, the carpenters embodied traditional construction practices in many ways.²⁵ Individual carpenters and carpenters' union leaders regularly exclaimed their apprehensions over the changing industry. Immediately after steel's introduction in building, one carpenter quipped, “Year after year work is becoming less plentiful owing to the recent innovations of architectural construction. With the introduction of iron and steel frames in the larger buildings... the chances of steady employment of carpenters is extremely uncertain.”²⁶ The United Brotherhood's 1910 president even stated that most jurisdiction disputes “generally arise over the erection of certain work which originally belonged to the carpenters, but which through the growth of the building industry has changed form to such an extent that you could not say unless you know the class of trade which put it up, to what trade the work now belongs.”²⁷ As such, carpenters came to represent accepted construction practices, stable skill, and inert technical knowledge.

Ironworkers, on the contrary, symbolized building change. Even throughout their many and tumultuous fights with employers and other trades, technology figured into their daily practices, discussions, and self-definition. For starters, the bridgemen regularly espoused technological rhetoric. Early on, the ironworkers aligned themselves with urban change, engineering skill, and constructive “superior intelligence.”²⁸ Labor development, they claimed, was a necessary component of modernity: “Labor – because the odds are so strong against it – must seize every opportunity.”²⁹ Modern notions, in turn, were a significant shaper of the workingman's operations and motives: “Efficient Workers Make Efficient Trade Unionists.”³⁰ Ironworkers, surely, reproduced much of the AFL's propaganda on capital's substitution of labor with technological investment.³¹ Yet, their daily interests and work tasks lay elsewhere.

Aside from proclaiming the wonders of their built technological marvels and of their own mechanical skill, bridgemen regularly followed changes on many technological fronts. *The Bridgemen's Magazine* reported monthly on changes in the material production of iron and steel. New structural and construction techniques were printed.³² Of most regular discussion, though, were articles and reviews of new construction equipment, particularly of cranes and power riveters (pneumatic and eventually electric).³³ Bridgemen intensely debated not *whether* to train themselves and their apprentices in converting from riveting to welding (which was even viewed with some apprehension by architects and structural engineers), but *how* that skill could best be learned.³⁴

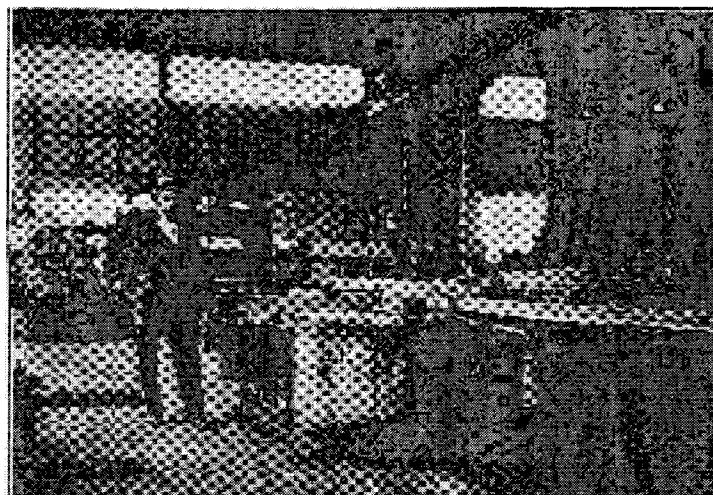


Fig. 4. J. Cavaginerio, ironworker, posing with his patented machine [*The Bridgemen Magazine* 27 (1927): cover].

Ironworkers did not just assimilate technical information from external sources, though. They often promoted the devices and techniques developed by their own locals' members. In the reports from each municipal affiliate, *The Bridgemen's Magazine* regularly printed letters from members seeking to publicize their inventions, asking for help to patent them, or simply advertising them for sale.³⁵ The trade journal even published a special issue on the “inventions of iron workers.”³⁶ J. Cavaginerio and the “power bender for reinforcing steel invented by him” were both proudly displayed on the cover. The lead article proclaimed the technical skill of the contemporary ironworker: “The former qualifications for the iron workers: ‘Strong back and weak mind,’ should not be accepted literally by the public. There is some indication that they have something under their ‘hat rack.’ The visible results of thinking, combined with creative talents, has been crystallized into the hand tools and the machines all the iron constructors use throughout the entire country.”³⁷

Economy in space, time, labor... The tools and construction methods reviewed were not simply novelties. In fact, they had been adopted on construction sites throughout the country: “There isn't a job where you can't see a Karpy bender, Lloyds floor hickies, machine made stirrups, and even blue prints are

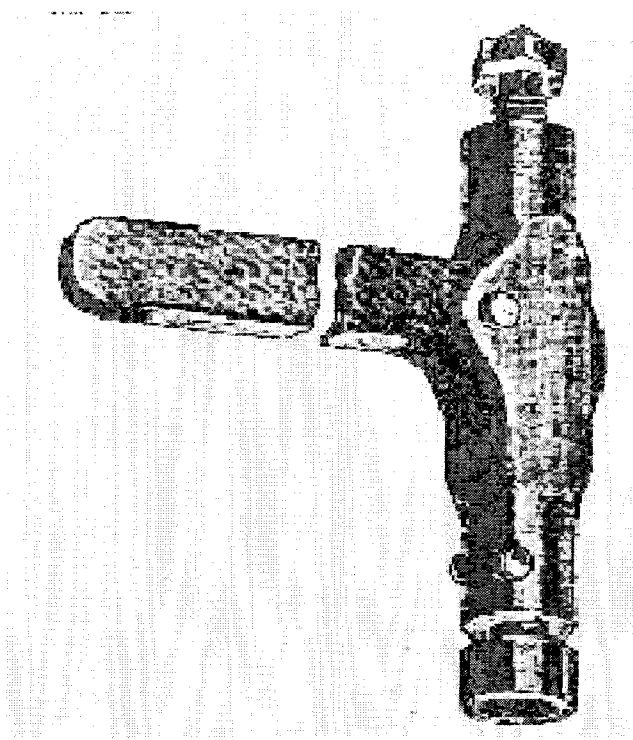


Fig. 5. Device produced by an ironworker and advertised in the ironworkers' journal. [The Bridgemen's Magazine 12 (1912): p. 562].

of iron workers' origination."³⁸ The ironworkers acknowledged that their inventions were not "epoch-making affairs," thought their use was commonplace. Many of these tools were not even patented, and were shared among the bridgemen themselves by word-of-mouth. While they dazzled at skyscraper designs, increasing steel beam strength, and construction equipment advances, then, the bridgemen felt that they played a specific technological role, as well. *The Bridgemen* concluded:

Often the improvements consisted merely of ideas how to do this or that thing better, quicker – improvements not of a patentable nature; often the originator of the idea didn't realize the financial value of his 'brain child.' This article, of course, cannot do justice to all of our men, who have contributed their share of improvements.³⁹

What was more, they believed that their technological contribution necessarily figured into many broader concerns. First, their professional identity was clearly intertwined with their interpretations of change in building technology, their own mechanical skills, and their conceptions of modern architectural form. Aside from their numerous disputes, strikes, and postures examined here, bridgemen saw technological change even as the solution to their occupation's safety hazards – the other trait which they considered to be an unfortunate focus of their identity.⁴⁰

Finally, ironworkers linked their tools, practices, products, and identity with the transformation of the American urban and

social landscapes. In fact, city growth meant many things to the bridgeman in the first few decades of the twentieth century. The visual changes on skylines were signs of better days for labor: "the most progressive western city that was ever visited by a cyclone never saw such a rapid growth of new buildings over the ruins of the old as Chicago's inhabitants are now beholding... This is the bridgemen's golden opportunity to insist upon better wages and an eight hour day."⁴¹ Increased city services, cleaner houses, and civic pride were all implicated in his daily work: "The new world contract which has been thrust upon us within the last few years brings an obligation to create a new, more beautiful, more efficient, more glorious America. The foundation of that America must be labor... Proper housing – housing that, no matter who the laborer or what his habits, creates the permanent home sense – will be an important determining factor in the situation."⁴² Summed up, changes in technology and form went hand-in-hand with changes in the bridgeman's social status and sense of purpose: "Steel beam construction revolutionized building, made skyscrapers possible, brought about Do you know what forced that change? The Structural Iron Workers' Union, dear sir – just that and nothing more."⁴³

NEW HISTORIES, NEW MAKINGS

The case of the early bridgemen is not an anomaly in building and architectural history. Even in the contemporary context, steelworkers associate themselves with technological and architectural prowess; in an announcement for its apprentice training program, one local affiliate of the steelworkers' union dictated: "Ironworkers must be ready to face the new world of the twenty-first century. We need to train ourselves to be able to compete with those that would work for less."⁴⁴

The belief that construction labor – its skill and its practitioners – is as critical to architecture, therefore, provides an opportunity to reconsider the history of architecture and architectural practice as extending beyond the history of architects alone. While the transformation of work through change in knowledge is, of course, not a new idea, the way that these changes took place on building sites reveals both the amazing complexity of the building industry and its many, oftentimes conflicting, interests, and how our built environment has been shaped by these industrial battles and ideals. The correlation between the dramatic changes in turn-of-the-century building technology and architectural form and the professionalization of the building industry is clear.

Yet, as the past review of professions shows, these shifts were mutually constructive. To look at the struggles of building labor and, indeed, all building professions, in their quest to define themselves is to look at a mirror of the struggles faced by architects. To look at these "other" groups then is to examine another outpost in architectural history.

NOTES

- ¹ On the architectural professions and building's industrial relations, see: Dana Cuff, *Architecture: The Story of Practice*. (Cambridge: MIT Press, 1991) and with Russell Ellis [eds.], *Architects' People* (New York: Oxford University Press, 1989); Kelly Crossman, *Architecture in Transition: From Art to Practice, 1885-1906*. (Kingston, Ont.: McGill-Queen's University Press, 1987); Spiro Kostof [ed.], *The Architect: Chapters in the History of the Profession*. (New York: Oxford University Press, 1977).
- ² Recent readings in building labor history include: Sidney Fine, "Without Blare of Trumpets:" *Walter Drew, the National Erectors' Association, and the Open Shop Movement, 1903-57* (Ann Arbor: University of Michigan Press, 1995); Richard Schneirov and Thomas Sutrbur, *United Brotherhood, Union Town: The History of the Carpenters' Union of Chicago, 1864-1987* (Carbondale: Southern Illinois University Press, 1988); Michael Kazin, *Barons of Labor: The San Francisco Building Trades and Union Power in the Progressive Era* (Chicago: University of Illinois Press, 1987); Mark Erlich *With Our Hands: The Story of Carpenters in Massachusetts* (Philadelphia: Temple University Press, 1986); and Walter Galenson, *The United Brotherhood of Carpenters: The First Hundred Years* (Cambridge: Harvard University Press, 1983).
- ³ Some recent scholarship has explored this terrain slightly. Of these, for example, a conference titled "Boys and Their Toys? Masculinity, Technology, and Work" held at the Hagley Museum in October, 1997 shed some preliminary light on the building professions, including one paper by Gregory Clancey, "Manhood by Design, by Construction: Architects and Carpenters as Masculine Binary."
- ⁴ Ernest O. Bostrom (Architect), "The Misplaced Keystone," *The Brickbuilder/Architectural Forum* 34:4 (April, 1921): p. 152. Emphasis in original.
- ⁵ -, "Eliminating the Architect?," *The Brickbuilder/The Architectural Forum* 37:3 (September, 1922): p. 66.
- ⁶ Charles Moore, "Training for the Practice of Architecture," *Architectural Record* 49:1 (January, 1921): p. 56.
- ⁷ Frederick Ackerman, "Craftsmen - Machines - Credit - Speed" in *Journal of the American Institute of Architects/Octagon* 11:6 (June, 1923): p. 249
- ⁸ The photos were show in the promotional materials from the Empire State Building's developers, Empire State, Inc., *Empire State: A History* (New York: Empire State, Inc., 1931). Other publications in which these photos appeared included: Sidney Blumenthal, "Through the Threads" in *American Magazine of Art* (August, 1930); Beaumont Newhall, "Lewis W. Hine" in *Parnassus* (March, 1931); a survey collection in *American Magazine* (May, 1931); "Sky Boys Who Rode the Ball" in *Literary Digest* (May 23, 1931); and Hester Jenkins, "Men and the Skyscraper," in *The Commercial Photographer* (August, 1931).
- ⁹ Captions of a photographic essay in *The American Architect* (November, 1930): p. 62-3.
- ¹⁰ *Chicago American* editorial reprinted in "The Structural Iron Workers. A Great Newspaper's Editorial Tribute to the Craft," in *The Bridgemen's Magazine* 1:5 (December, 1901): p. 169.
- ¹¹ For a reading of the essay's text, see Ernest Poole, "Cowboys of the Skies" in *The Bridgemen's Magazine* 9 (1909): p. 72; or *Everybody's* 19 (November, 1908): p. 641
- ¹² "Walking at a Dizzy Height," *The Bridgemen's Magazine* 9 (1909): p. 26.
- ¹³ International Association of Bridge, Structural, and Ornamental and Reinforcing Iron Workers, *A History of the Iron Workers' Union* (Washington: IABSORIW, 1996): p. 2. This publication was had earlier appeared as a series of articles in *The Ironworker* (the current title of the trade journal known earlier as *The Bridgemen*) and was written by the magazine's editorial staff. An edited but unpublished selection of these articles was given to me by *The Ironworker's* staff and are the source for these events.
- ¹⁴ See Engineering News Record, *A Half-Century of Prices and Wages in the Construction Industry, 1874-1924* (New York: Engineering News Record, 1924). The following hourly wages were reported for the respective years of: 1907- \$0.60; 1910-\$0.625; 1916-\$0.66; 1917-\$0.69; 1918-\$0.80; 1919-\$0.875; 1920-\$1.11; 1921-\$1.125; 1923-\$1.16; 1924-\$1.25. These wages compared well to those of carpenters and bricklayers. This data was compiled by Engineering News Record from the US Bureau of Labor Statistics.
- ¹⁵ See US Department of Labor Bureau, Bureau of Labor Statistics, *Descriptions of Occupations: Metal Working, Building and General Construction, Railroad Transportation, Shipbuilding* (Washington: GPO, 1913): p. 52. The bureau had official classifications, definitions, and training requirements for the "bridge and structural-iron worker," the "foreman," the "hand riveter," the "pneumatic riveter," and the "rivet heater," all formal labels for riveting gang members.
- ¹⁶ Ironworkers' training period lasted (and still lasts) for between six to eighteen months, much less than the three to four years of apprenticeship necessary in other trades. It has been suggested that this is due to the need for placing ironworkers quickly (since so few people apply to enter this trade) and because they must work over larger regions, thereby making their training more
- ¹⁷ See American Federation of Labor-Central Industrial Organization, *The Builders: The Seventy-Five Year History of the Building and Construction Trades Department, AFL-CIO* (Washington: AFL-CIO, 1983): p. 160.
- ¹⁸ *Ibid.*: p. 159. The strike was over establishing the eight-hour work day. The group was reformed in 1896.
- ¹⁹ See Earl McMahon, *The Chicago Building Trades Council: Yesterday and Today* (Chicago: Chicago Building Trades Council, 1947) for an account of this. The three groups were separated along lines of national origin: one being for Germans, the other for Englishmen, and the third for Bohemians, and ran under names like "Bridge Builder's Mutual Association."
- ²⁰ Again, the strike and subsequent union bust was over the eight-hour work day. In Chicago, the strike ended after eight weeks.
- ²¹ The International formed on February 4, 1896 in Pittsburgh under the leadership of Chicagoan Frank Buchanan. The name changed over the next few decades to include first ornamental ironworkers (IABSIOW) and, in the 1940s, to include the reinforcing workers (IABSOIRW). I refer to this group by its original name throughout this discussion.
- ²² See Fine, *op. cit.*
- ²³ See Ernest Bogart, "The Chicago Building Trades Dispute" 15:2 *Political Science Quarterly* (June, 1901): p. 222.
- ²⁴ *Ibid.*: p. 247.
- ²⁵ In Galenson, *op. cit.*, the author suggests that carpenters were more affected than other trades by technological change since their productivity didn't increase as much as the increase in contract construction value, thereby making them more conscious of jurisdictional rights. Similar claims are made by Houlihan, *op. cit.*
- ²⁶ Statement of General Secretary P. J. McQuire at the union's 1894 convention (in *Proceedings*: p. 67) and reprinted in Whitney, *op. cit.*: p. 36.
- ²⁷ Statement of President Huber at the union's 1910 convention (in *Proceedings*: p. 67) and reprinted in Whitney, *op. cit.*: p. 57.
- ²⁸ "Engineering and Construction, Great Strides In Everything Connected With Bridge Construction," in *The Bridgemen's Magazine* 1:4 (November, 1901): p. 128.
- ²⁹ "Making Progress," *The Bridgemen's Magazine* 23 (1923): p. 413.
- ³⁰ Title of essay by William Green (President, American Federation of Labor), *The Bridgemen's Magazine* 26 (1926): p. 219.
- ³¹ See for example, "Management Displacement And Unemployment," *The Bridgemen's Magazine* 29 (1929): p. 227; or "Technological Unemployment," *The Bridgemen's Magazine* 30 (1930): p. 325.
- ³² See "The Suspended Falsework for the Manhattan Bridge" p. 498; or "Steel Ribs and Lugging for Concrete Forms....A new use for steel," p. 553, in 8 (1908). Such articles appeared almost bimonthly. Note that these articles appear next to an article proclaiming the inferiority of non-union work.
- ³³ For example, "Modern German Bridge Cranes for Handling Steel Beams," p. 123 and "The Merrill-Schoffner Pneumatic Tool Holder" p. 384 in *The Bridgemen's Magazine* 8 (1908); "Steel Derricks for Erecting Tall Buildings" in 9 (1909): p. 193; "Boyer Pneumatic Hammers" 23 (1923): p. 225 and 266.
- ³⁴ "New Arc Welding School," *The Bridgemen's Magazine* 28 (1928): p. 267; "Course in Welding," *The Bridgemen's Magazine* 31 (1931): p. 590. On the presentations of welding at bridgemen's conventions and debates over how best to train workers, see "President's report, New Methods of Construction," and "Reports of Committee" *The Bridgemen's Magazine* 32:10 (October, 1932): p. 86 and p. 250, respectively (This was first presented at the

union's 24th Convention on September 24, 1932); and "President's report, 'New Methods of Construction,'" *The Bridgemen's Magazine* 36:10 (October, 1936): p. 62. (This was first presented at the union's 28th Convention on September 21, 1936). See also, pp. 105, 161, and 282 in the latter for more discussions.

³⁵ For example "Local Union No. 22, Indianapolis, Indiana, July 25, 1912" *The Bridgemen's Magazine* 12 (1912): p. 562, in which the editor reports "I am also enclosing cut of a patent jam dollie which was invented by Bro. Al Ricketts, of Local No. 22. This tool is being used by several firms in this locality and is giving satisfaction. In fact, it is recommended by some of them. Anyone desiring further information in regard to same may obtain same by writing the secretary of Local No. 22." Such locally-made devices were regularly published throughout the first decades of the journal's printing.

³⁶ *The Bridgemen's Magazine* 27:10 (October, 1927).

³⁷ A. Lellep. "INVENTIONS OF IRON WORKERS" 27:10 (October, 1927): p. 3.

³⁸ *Ibid.*, p. 3. By the way, the "Karpy bender" enabled workers to bend reinforced steel bars by hand. Jack Cavaginer's cover page "power bender" did the same but for significantly heavier bars and even some beams.

³⁹ *Ibid.*, p. 4.

⁴⁰ Safety was a regular concern with ironworkers since they did have one of the highest rates of work-related death and accident. For sample of this and how

changes in tools and practices were configured to change this, see Building Trades Department of the American Federation of Labor, *Report of Proceedings of the Eleventh Annual Convention Held at Buffalo, New York November 7-10, 1917* (Washington: AFL, 1917) and Building Trades Department of the American Federation of Labor, *Report of Proceedings of the Fifteenth Annual Convention Held at Denver, Colorado June 8-11, 1921* (Washington: AFL, 1921) [both in the Meany Archives: Building Trades Department Record Group, "Proceedings, 1908-1948"]; Bridge and Structural Iron Workers' Union No. 1 of Chicago Illinois, *Industrial Accident Report for the Year 1919* (Indianapolis: William Burford, 1921); "Safety Building Code," *The Bridgemen's Magazine* 21 (1921): p. 379.

⁴¹ *The Bridgemen's Magazine* 1:6 (January, 1902): p. 201.

⁴² Noble Foster Hoggson, "The Challenge of the Housing Problem" in *The Bridgemen's Magazine* 18 (1918): p. 194-5.

⁴³ "The Height of Hazard," *The Bridgemen's Magazine* 4:4 (April, 1905): p. 15. In this essay, the journal's editors pay particular attention to the sacrifices that bridgemen have made (particularly, the number of deaths) to bring about these changes. It is interesting to note that on the same page of this article a singular quote is printed: "Custom is the arch foe of Progress."

⁴⁴ Ironworkers District Council of Greater New York Joint Apprentice and Trainee Committee of Locals 40 and 361 announcement in Local 361's webpage.