Clues to a Mystery in Banff; Rebuilding Wright

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A detective-like research team in the Department of Architectural Science at Ryerson University is attempting to piece together a series of clues in an attempt to rebuild the destroyed Frank Lloyd Wright Pavilion in Banff, Canada. The project team consists of specialists in structures, technology, design, history, and heritage. This diverse group of professionals reinforces the idea that design in architecture is not solely about designers but instead of playing cooperatively with specialists in multiple fields.

Understanding concepts of play have proven useful in recreating this project. Play, as a philosophical concept (Hans-Georg Gadamer, James Hans), provokes the actions of 'give and take' that can become a design dialogue. Other aspects of play include the boundaries that surround the activity of play, along with representational qualities that make something 'stand for' something else. The importance of play is often the intelligibility or the learning that results from the activity of play; the repeatability allows the chance to alter and manipulate to discover something new. We learn through the simulation, the process of representation. Hans writes that "This [play] requires that the 'rules' of the game that the work of art itself establishes--the player begins with his [her] own fore-conceptions, but he [she] must be led by the work itself, must accept the rules of the work itself." (Hans, 1980)

In an example of how we are using concepts of play, the Frank Lloyd Wright Banff Pavilion Initiative is recreating incomplete drawings of the Pavilion. We are exploring Frank Lloyd Wright's design process, and specifically, his use of geometries, the drawings for the Banff Pavilion are being re-created. Clues have led to evidence of squares and the golden section ratio in the plan, section, and elevation. From these clues, the research team was able to determine probable dimensions using proportion. Other activities using a concept of play include research into past flooding of the Bow River that attributed to the Pavilion's demise, exploration of photographs and archival materials, heritage principles that will guide the rebuilding, and reconstructive research into materials, mechanical systems, structure and acoustics that will bring the building back to life.

The team is currently looking for clues to provide evidence that will allow an accurate rebuilding of the Banff Pavilion. We need to ask the question of who or what originally destroyed Frank Lloyd Wright's Banff Pavilion? Was the Pavilion's demise an accident, an act of nature or a premeditated action – and what can prevent it from happening again? Who were the suspects and what role did they play in the original construction? What will allow the Pavilion to function today? Through concepts of play, this paper will document the preparations for the rebuilding of the only public Frank Lloyd Wright building in Canada.

A detective-like research team in the Department of Architectural Science at Ryerson University is attempting to piece together a series of clues in an attempt to rebuild the destroyed Frank Lloyd Wright Pavilion in Banff, Canada. The project team consists of specialists in structures, technology, design, history, and heritage. This diverse group of professionals reinforces the idea that design in architecture is not solely about designers but instead, playing cooperatively with specialists in multiple fields. The Banff Pavilion was designed by Wright with the assistance of Francis Sullivan who was one of his apprentices living in Canada at the time.

It is clear that Wright was trying to help Sullivan start his career but in this process, it seems Wright simply revised his River Forest Tennis Club project in Illinois and gave it to Sullivan. The problem with this duplicated design is the fact that Illinois is very different from Banff and the site difficulties were overlooked. The flooding of the Bow River in Banff was not accounted for by Sullivan or Wright and as a result the pavilion was demolished due to water damage by 1939.

Quoting a recent Wall Street Journal article on the project,

> "A baseball diamond in the Canadian town of Banff may be hiding the answer to an architectural mystery. If a team of professors is right, buried beneath the baseball field on the edge of Canada's Rocky Mountains is the foundation of the Banff National Park Pavilion, one of only two buildings in the country designed by Frank Lloyd Wright. The structure was demolished just before World War II, and nobody today seems to know exactly where it stood. Finding its foundation could be one of the keys to an effort by architects from Toronto's Ryerson University, who are trying to rebuild the pavilion as faithfully to the original as possible. The trouble is, they aren't sure exactly how Wright designed it in the first place. "We're following all the breadcrumbs," said Yew-Thong Leong, associate professor of architecture at Ryerson."

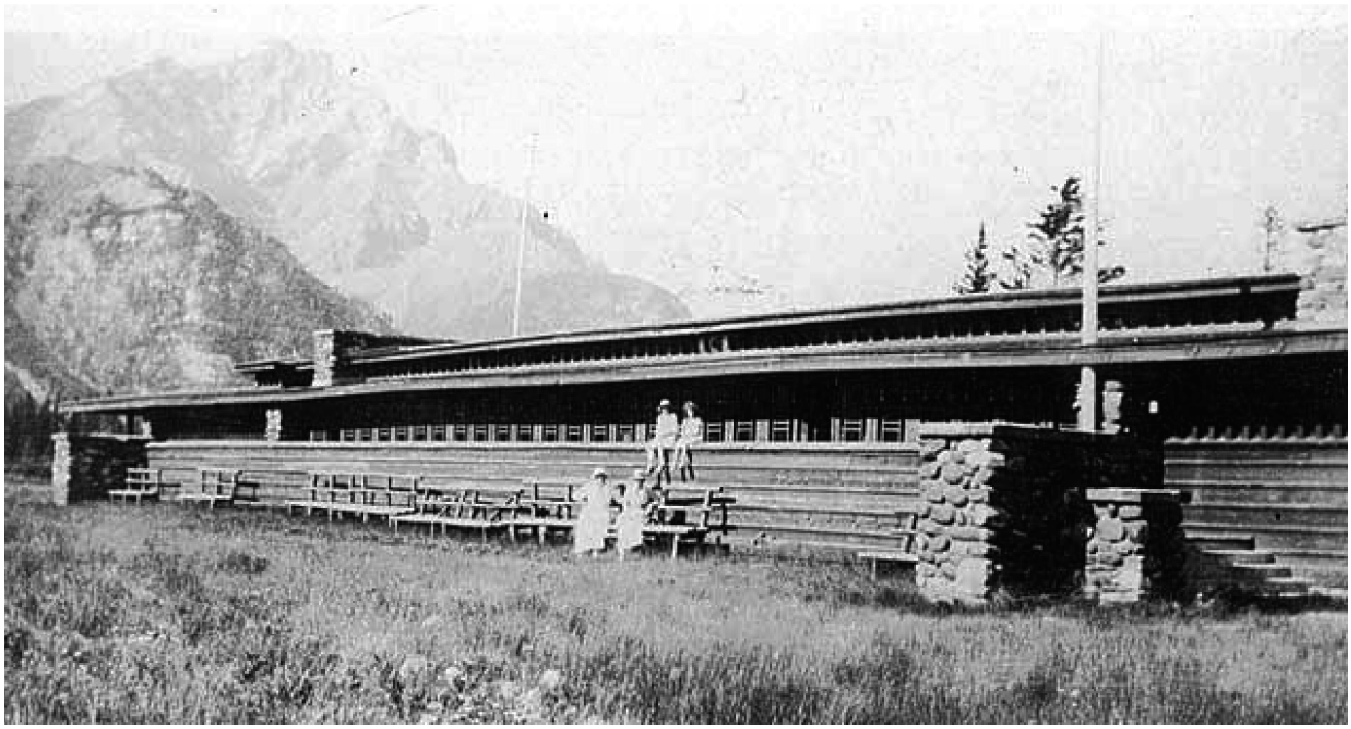

Figure 1: Banff National Park Pavilion 1920 in Alberta PD Canada.

We have been playing a game, similar to Clue, following the breadcrumbs, and using educated guesses (and elimination) to draw conclusions. The game of Clue allows participants to roll the dice, and move into various rooms on the playing board. Once in a "room" the player can propose a solution to the mystery. This proposal usually stems from the elimination of inaccurate previous proposals. This proposal, similar to a research hypothesis, then advances knowledge and limits the possible solutions.

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We recognize that play works within certain boundaries and in this case, they are physical, political and cultural. The heritage aspects provide certain guidelines as do the boundaries of the drawings, photographs, site, etc. This has required some give and take to locate appropriate information. The repeatability of the place gives the project opportunities to alter, manipulate and discover new things – such as repeating Wright's method. Key to our process has been representation and simulation. 3D modeling has helped indicate and identify what we know, what we do not know and what we suspect. We are finding it is a process of learning or finding intelligibility. It is through the action that we learn more. We are reading the signs and looking for clues. As in detective work, it is also a process of deductive reasoning like the game clue, but of course, the abductive logic of educated guesses.

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The Pavilion is the Wright Initiative's first project, and it is a relatively simple structure. However, once the Ryerson team

Figure 2: Interior Model, Yew-Thong Leong.

got the pavilion's original drawings, made on linens stored in Canada's national archives in Ottawa, the scholars found it may not be as easy as they initially thought.

Lines that appear straight on the linens were crooked when scanned into a computer. Though the building was asymmetrical, only one side of the plans had dimensions noted. The schematics lacked specifics about such critical details as the dimensions of the windows, a kitchen area and supporting pillars. Some directions were left up to workers of the day to interpret. Instructions for the roof, for example, simply read "lathe and plaster."

Lacking necessary information, the crew has had to deduce Wright's intentions. They have tried to apply mathematical principles he was known to favor, such as squares and double squares, but also the Golden Ratio, which designers use to mirror nature and create pleasing proportions, and harmonic series, where proportions are based on musical frequencies. To ensure that the workmanship is accurate, the Ryerson researchers turned to 1900s building manuals to relearn some of that era's building techniques.

Another key; the Banff pavilion is similar to Wright's River Forest Tennis Club, an Illinois construction from the same era. Both buildings are long, single-story structures with hipped roofs and wide chimneys. Though the tennis club is longer than the pavilion, the Ryerson group has tried to apply dimensional theory, based on the proportions of tennis courts, to the Banff project.

The team has been struggling with mistakes that Wright made, such as the pavilion's flood-prone location. "He may never have been to Banff," said Mr. Leong. "Things got missed." The architects ran a 100-year analysis of the flooding from the Bow River and discovered that at times the building could be submerged in as much as 3½ feet of water. To deal with the problem, they have considered building automated stilts that could lift the building when the Bow overflows, surrounding it with an inflatable pontoon to keep it afloat, or damming the river to redirect the flow of water." Currently, we are suggesting that the site be bermed.

The drawings (elevations) show field stones for the foundations and fireplaces. Recognizing that what was built would invariably be different from these drawings, research was completed to discover the size, number, and assembly of the field stones. To be as accurate as possible, when recreating the drawings that will be used to eventually rebuild the pavilion (and with heritage principles in mind), the team is trying to locate and identify specific stones used. Team members are using the limited existing photographs in a technique called photogrammetry, to accurately model (the size and shape) of the stones, looking for patterns and strategies employed by the masons. A stonemason would have had a conscious or subconscious strategy when laying the stones. We have modeled and numbered all the stones visible in photographs. In this process, we have noted that the cornerstones are more substantial, have been stacked vertically and represent stones of a larger size. The infill stones are smaller and stacked more horizontally. By identifying and modeling each stone, we are hoping to achieve a more accurate and heritage based recreation.

From a visit to the Tennis Club, we have noticed reinforcing gusset plates on the trusses. Part of our work will be to calculate the roof structure – especially accounting for Banff conditions. From photographs, we have found that the roof slope as built, is different from the drawings. The design of the roof is a clerestory configuration made up of two segments of a hip roof interrupted by a clerestory. We see some geometrical acrobatics in that the two segments of the roof are not the same slope. Through analysis of the photographs, the clerestory detail at the ends of the roof is an odd geometry where the two slopes and the squared ends coincide. It was difficult to understand (from the drawings) how such a detail as this was constructed. We are currently playing with the possibilities through 3D modeling.

Some things will need upgrading from early 1900's construction techniques such as electrical wiring. Locating the lighting fixtures or having them reproduced will be a challenge. The original pavilion was not heated, so we think the least obtrusive system (and may be consistent with eastern traditions) would be underfloor radiant heating. Recreating the doors and windows will be explored from a combination of drawings

Figure 3: Interior of Banff Pavilion, Yew-Thong Leong.

and photographs. We have heard rumors that during the time of demolition, windows were removed, taken into private homes and may still exist. The detective work has prompted us to follow a trail that seems to lead to Vancouver. We are also speaking with wooden window fabricators about how to fabricate them and also, using heritage guidelines, add an extra layer for insulation.

We have looked at the length of the time it will take to evacuate this small pavilion for fire safety.

Additionally, we are researching the orientation of the project which we want to make sure is correct, and that nothing we are doing is changing the quality of the light in the building. Our studies are raising questions about the requirements for artificial illumination. Finally, we are considering possible functions for the building, for the City of Banff. We are suggesting such events as weddings and musical venues. How do we create acoustics for possible musical performances but not change the integrity of the original design? We are analyzing the sound quality, assuming several instruments in the main space. We are exploring this through the use of moveable acoustical panels, the location of the music source – and have studied the space filled with people or in contrast, a room partially filled.

What we have spoken about today represents a few of the areas of our research. In conclusion, the team is currently looking for clues to provide evidence that will allow an accurate rebuilding of the Banff Pavilion. We need to ask the question of who or what originally destroyed Frank Lloyd Wright's Banff Pavilion? Was the Pavilion's demise an accident, an act of nature or a premeditated action – and what can prevent it from happening again? Who were the suspects and what role did they play in the original construction? What will allow the Pavilion to function today? Through concepts of play, we are working on the preparations for the rebuilding of what will be the only public Frank Lloyd Wright building in Canada. The Banff Pavillion mystery continues. Our project remains a work in progress, many times using clues to make educated guesses –in other words, we are still playing the game.

ENDNOTES

1. Correspondence between Wright and Sullivan from the collection of Arthur Allen and also conversations with Arthur Allen.
2. From research by Arthur Allen.
3. Vipal Monga, "The Quest to Recover a Lost Frank Lloyd Wright Building," Wall Street Journal, (May 30, 2018).
4. James S. Hans, "Hermeneutics, Play and Deconstruction," Philosophy Today, 24, no. 4, (1980): 306.
5. We are referring to concepts of abductive reasoning as introduced by Charles Saunders Pierce and Umberto Eco.