



Welcome to 3rd class of **Five More 20th Century Houses**

Today, **Fallingwater**, Frank Lloyd Wright (Bear Run, Pa, 1935-1937, 1939)



Last week, **Villa Savoye**, Le Corbusier (Poissy, France, 1928-1931), considered to be the pinnacle of Modern Architecture, with its **long horizontal ribbon window**, the **most significant window in 20th century architecture**.



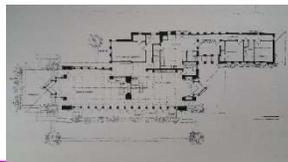
Started off course, (Truus) **Schroder house**, by Gerrit Rietveld (Utrecht, 1925) **influenced by Robie House**, Frank Lloyd Wright (Chicago, 1909-1910) illustrated in De Stijl publication (vol.1, no.4, pp.62-65, 1918).



Quick **POLL**: Which house is **more modern**, in the **design and expression** of the architect's **vision of the modern age**? **Schroder house** or **Villa Savoye**



Origin of Modern, **Robie House**, Frank Lloyd Wright (Chicago, **1909-1910**) **Horizontality**, of the ground, **broad overhangs** creating **deep shadow lines**, **window screen framing open prairie**, **continuous, uninterrupted**, extending **horizon**.



In plan, on the interior, **continuous open floor plan**, allows the house to **elongated along the length of the street**, emphasizing the **continuous horizontal line**.



Most significant element, **horizontal plane in cantilevers of the projecting roof**. We will return to this later, in second half of today's lecture.



Friedrich Froebel blocks (1838-40)



3:10

"The (Laura) **Gale house** (Frank Lloyd Wright) built in wood and plaster in **1909** was the progenitor, as to the general type, of **Fallingwater** in 1936."

massive chimney wall, flat slab roofs, balconies, corner and ribbon windows.

Fallingwater upper terrace projects beyond lower, for dramatics, **Gale house** is in.



Maison et Arbre (Georges Braque, 1908)

Brick Factory at Tortosa (Pablo Picasso, 1909)



Wright's fundamental breakthrough toward **Cubism in architecture**, **same year** Braque and Picasso worked out **Cubism in painting**.



Dutch architect **Robert van't Hoff**, knew of **Gale house** from a visit with Wright, reproduced it in a **concrete villa** near Utrecht (**1916**).



abstracting Box into parts

Theo van Doesburg and De Stijl architect **Cornelius van Eesteren** abstracted the **Gale house** in **floating 3D Cubist painting and model**, at Paris Exhibition (**1923**), intermediated by Piet Mondrian.



"destroy Box"

Months later **Gerrit Rietveld** produced **Schroder House (1923)**, **deconstructing Gale house** apart into **detached horizontal and vertical planes**.

Wright was aware of these, as **van't Hoff** continued to **feed news of European modern architecture through the 1920s**.



July 3, 1935 site visit (first site visit to Bear Run was **December 1934**), standing at foot of the main waterfall, **Wright** pointing to spot alongside falls he intended the house, said "**we are going to beat the Internationalists at their own game.**"

(Braque/Picasso; van't Hoff/Van Doesburg/Rietveld; Gropius/Mies/Corbusier)

Only two projects constructed 1928 - 1935. At age 69, **within one year (1935)** came **Fallingwater**, **Johnson Admin Bldg**, 1st built Usonian home (**Jacob House**, to be covered in next course: **Last Five 20th Century Houses**).



Nickname of the Kaufmann's **old cabin on Bear Run**: **The Hangover**.

"There in a beautiful forest was a solid, **high rock ledge rising beside a waterfall**, and the natural thing seemed to be to **cantilever the house from that rock bank over the falling water**," "The site determined the character and features of the house." While this landform may have dictated—in Wright's mind—the obvious building site, its massing and material palette were entirely his invention.



Box into Blocks, turned, shifting, sliding

Parti: **Robie house** **continuous horizontal line, running parallel along Bear Run**, **crossed overtop** by **Gale house** **projecting balcony mass, suspended over waterfall**.

Over **next two months**, worked out **functional layout of living spaces inside house** and **formal massing between building and site** (1,543 acre forest, rocks, stream).

Wright warned his apprentices that the last thing they wanted to do, was to fix a design on paper too early: "One must be able to walk around and inside the structure, **know every detail, before putting pencil to paper**. I never sit down to a drawing board - and this has been a lifelong practice of mine - until I have the **whole thing in my mind**. I may alter it substantially, I may throw it away, I may find I'm up a blind alley, but unless I have the idea of the thing pretty well in shape, you won't see me at a drawing board with it. But all the time I have it germinating, between three o'clock and four o'clock in the morning."

"Working on it with triangle and T-square should modify or extend or intensify or test the conception, complete the harmonious adjustment of its parts."



+1

Wright's visual spatial memory



Then **Sept. 1935**, **Kaufmann** in Milwaukee for business, visits **Wright** at Taliesin pressing him to see the designs he had been working on.

View of Ono Falls (Hokusai)



More money **collecting/selling Japanese prints**, than architectural commissions.



Kaufman preferred house below the falls, looking back up at it. Wright did not want the falls to be merely a sight, wanted Kaufmanns to **be a part of nature**, just as they would **sit on the rocks above the falls picnicking, plunging in the water under the falls.**

"Taliesin means shinning brow. Taliesin is built like a brow, on the edge of the hill. Not on top of the hill, because **I believe you should never build on top of anything directly.** If you build on top of the hill, **you loose the hill.** If you build on one side of the top, you have the hill and the eminence you desired."

By building on top of the waterfall, the house becomes the waterfall.

"You can hear the waterfall in the design. At least it is there."

"Fallingwater is a great blessing - one of the great blessings to be experienced here on earth. I think nothing yet ever equaled the coordination, sympathetic expression of the great principle of repose where forest and stream and rock and all the elements of structure are combined so **quietly** that really you listen not to any **noise** whatsoever although the **music of the stream** is there. But you listen to Fallingwater the way you listen to the quiet of the country."

Knowing the Kaufmanns' love for nature, Wright told them in 1935: "I want you to **live with the waterfall**, **not just to look at it**, but for it to **become an integral part of your lives.**" Fallingwater therefore suspends the architecture above the fall itself, **filling the home constantly with the powerful sound of rushing water.**

Wright: **sight of waterfall become boring, conditioned, habituated to it daily.**

Just as the camp retreat visited on summer weekend trips, held excitement in an **infrequent experience**, the **falls had to be hidden under the house.**

Sight of waterfall deprived inside, accentuating **awareness of the sounds** (smells, cool air) of falls [Bach Nackt] 2023.10.30 9:42am oo

Six Bathrooms floors / walls tiled with **cork**, to **contain artificial water sounds**, from mixing with natural water sounds of falls.



Above falls, living spaces orientated toward stream will face **southern exposure** (Feng shui). Below the falls, orientation toward falls would face north (w/o light).

Japanese house



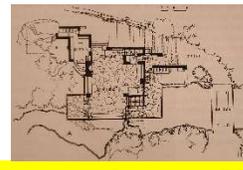
■ Japanese device of **'borrowed view'**, bringing the horizon, distant mountain, into the composition, as part of the site; so too Wright is bringing the natural environment that surrounds the house, the sunlight, stream, trees, hillside boulders, **into the design as part of the house.**

+1



Taking from **Japanese house**: **sliding screens, expanding inside outside**, **Fallingwater eliminates Box**: **walls > screen wdws, elevate planes w/o columns.**

"**Box is a fascist symbol.** The architecture of **freedom, democracy** needed something besides the box, so I set out to **destroy the box as a building.** With the **corner window**, light came in where it had never come in before. **Vision went out.** And you had **screens instead of walls.** Walls vanished as walls and box vanished as a box. Corner window was **release of the entire sense of structure.**"



+2

Every interior space with an exterior terrace, to **move out immediately.**



+14

Stair down to stream in Living room (Kaufman didn't see point), immediately connected (■ **not distanced, isolated**).



"The **third dimension** never as weight or mere thickness but always as depth, an element of space, the third dimension transformed as a space dimension. A penetration of the inner **depths of space in spaciousness becomes architectural** and valid motif in design. With this concept of depth interpenetrating depths comes flowering a **freedom in design** which architects have never known before but which they may now employ in their designs as a true liberation of life and light within walls, a **new structural integrity, outside coming in**, and the **space within, to be lived in**, going out. Space **outside becomes a natural part of space within** the building. ...renders the old static post and girder, beam and box frame type of construction, however novel they seem to be made. Walls are now apparent more as humanized **screens**. They do define and differentiate, but never confine or obliterate space. A new sense of reality in building construction has arrived."

"Noble, vital, exuberant forms are already here. **Democracy** awakes to a more spiritual expression. Indigenous culture will now awaken. Properly focused upon **needs of twentieth century life**, new uses of livable space will continually evolve, improved, more exuberant and serene. ...they are going to demand appropriate space-homes on these modern terms. We will soon see the **house as a work of art** and because of its intrinsic beauty more a home than ever."

[A Testament, 1957]



+14



■■■ **compression of stairs and hallways**, mazed narrow passages through house, as walking through **thickets in woods**, seeking opening, **desire and drawn toward clearing**, **feeling created by open spaces** (living, bedroom), expanding further on exterior terraces.

Audrey Hoover's notes (**awareness**) from visiting Fallingwater (Oct.29, 2023):
 "I really liked the brown/orange color all over the house. It **felt** really natural and wooden."

Wright suggested to Kaufman that Fallingwater ought to be **gold-leafed** inside and out (**Japanese**). Kaufmann hired a leafer who spent one day working, at the end of which said the idea was absurd and left. So, the "dead rhododendron" (**ochre**) color was adapted for the concrete surfaces.

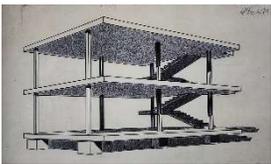
The house's material palette is simple and largely unadorned, aside from two paint colors: **ochre** on the concrete elements and **Cherokee red**—the architect's signature earthen hue—on the steel sash windows and doors.

Nonstructural wood is **North Carolina black walnut**.

Several centuries old **chairs at dining table** found by Mrs. Kaufmann in Italy. Have only **three legs**, making them stable on rough (uneven) stone floor.

Fireplace kettle for mulling of wine, holds 18 gallons.

Kitchen in original **St. Charles cabinets**.



Corbu: Organic sense of space / integral structure as Modern

1. Pilotis: FLW **no columns**, but elevated.
2. Roof garden 2x site: FLW multiple **terraces 4x site**.
3. Free plan: FLW **open plan**.
4. Ribbon window: FLW **corner wdw**.
5. Free facade: **no walls** (Japanese screens).





+5



4:05

~~"Wood is universally beautiful to man. It is the most humanly intimate of all materials. Man loves his association with it, likes to feel it under his hand, sympathetic to his touch and to his eye."~~

~~"And yet, passing by the primitive uses of wood, getting to higher civilization, the Japanese understood it best, gave it ideal use in that masterpiece of architecture, the **Japanese dwelling**, as well as in all that pertained to living in it."~~

~~"In Japanese architecture may be seen what **a sensitive material** let alone for its own sake can do for **human sensibilities**, as beauty, for the human spirit."~~

~~"And when we see the bamboo rod in their hands, seeing a whole industrial world interpreting it into articles of use and art that ask only to be bamboo, we reverence the scientific art that makes wood theirs. The simple Japanese dwelling with its fences and utensils is the revelation of wood."~~

[Architectural Record, Oct. 1928]



+3



■■■ "wood and plaster will be content to be, and will look as well as wood and plaster, will not aspire to be treated to resemble marble. Nor will concrete buildings, reinforced with steel, aim to resemble cut-stone or marble. Each will have a grammar of its own, **true to materials**, as in the **new grammar** of **Fallingwater**, **my first dwelling in reinforced concrete**."



(2min. video)

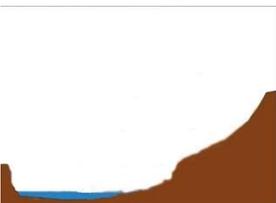
traditional Post & Beam replaced by

Organic: integral tenuity

Next six months, worked out **structural design of the cantilevering terraces**, completing **March 1936**. **Begins construction April 1936**, through **Dec. 1938**.

\$35K budget (\$11,800 arch. fee)

\$155K cost (\$3.3 million today)



Cut into hillside and four foundation piers to support cantilever beams and slab



"The **cantilever slabs** here carry **parapets** and the beams. They may be seen clutching big boulders. But next time, I believe, **parapets will carry the floors** - or better still we will know enough to make the two work together as one, as I originally intended."

"What kind of intellect must the critic have who seeing a building judges it by 'the look of it', ignoring the **nature of its construction**?"

"**Light and thin walls** may now depend from **cantilever slabs** supported from the interior on shallow, dry-wall footings, walls themselves becoming slender screens, entirely independent of use as support. In general, structure now becomes an affair from the **inside outward** instead of from the outside inward. Glass (or light plastics) may be used to fill in and make the whole habitable. Enclosures extremely light in weight combined with such structural elements relieve all modern building of surplus static, structure no longer an obesity or likely to fall of its own weight. The **new sense of interior space** as reality may characterize modern building. Style will be the consequence of **integral character**. Intellect thus reinforces and makes Spirit effective. An art as flexible, as various, as infinite in its possibilities as the spirit of man."

"The structure might serve to indicate that the **sense of shelter** – the sense of space where used with sound structural sense – has no limitations as to form except the materials used and the methods by which they are employed for what purpose. That is all. The effects you see in this house are not superficial effects."

"**Reinforced concrete** was actually needed to construct the cantilever system of this extension of the cliff beside a mountain stream, making living space over and above the stream upon several terraces upon which a man who loved the place sincerely, one who liked to listen (not see) to the waterfall, might well live."

"These deep overhangs provide the interior, as usual, with the **softened diffuse lighting** for which the indweller is invariably grateful, I have found"

[Architectural Forum, 1938]



"The roof water is caught by a lead strip built into the concrete above the beginning of the curve. It is not the deluge of water in a storm that hurts any building: it is ooze and drip of dirty water in **thawing and freezing**, increased by slight showers."



Rounded tops of concrete terrace walls was added only after reinforced walls had set a few days and over the years, the wall caps and surfacing separated from the walls, due to **acid rain seeping in** and **freezing and thawing**. The acid ate into the reinforcing steel cantilevering, causing failure requiring major reconstruction (2001-2002).

In 2002, Fallingwater's famous cantilevers underwent a major structural restoration to prevent their collapse (adding **post-tension cables**). Engineer omitted neg. bars?

Vertical elements, structural piers and chimney, took inspiration from rocky site, clad in **Pottsville Sandstone** (quarried from Pottsville ridge, between Harrisburg and Allentown), laid in horizontal striations, as in natural surroundings. To further the house's connection to nature, Wright used **flagstone flooring** inside and out (nature-loving Kaufmann family).

"As interior space to be lived in becomes the reality of building so shelter thus emphasized becomes more than ever significant in character and important as a feature."

"The **new sense of spaciousness** requires, as inherent human factor, significant cover as well as **shade**. ■■■ Solidity of walls vanishing to reappear as imaginative **screens involving light**, and as inevitable consequence leaving more responsibility to the shapes and shaping of the whole building 'overhead' with direct reference to the elements. Radical structural changes (**cantilever**) too now make the overhead lighter, less an imposition, more graceful, more harmonious feature of environment. Organic architecture sees shelter not only as a quality of space but of spirit, and the prime factor in any concept of building man into his environment as a legitimate feature of it."

■■■ "Weather is omnipresent and buildings must be left out in the rain (moisture, humidity, **freezing**). Shelter is dedicated to these elements. So much so that almost all other features of design tend to lead by one another to this important feature, shelter, and it's component **shade**. In order to complete the building, protecting all within it from every changing circumstance of light, of cold and heat, of wear and tear and usage, we require shelter. The occupants of a building readily discover greater opportunity for comfort and more gracious, expanded living wherever **shelter is becoming shade**. By shade, charm has been added to character, style to comfort, significance to form."

How to provide a **sense of shelter without physical form?**

Walls create a feeling of enclosure, roof a sense of shelter.

Shade (filtered/reduced light, Bach Nackt ■) offers sense of shelter, for a space that is **open to nature**, i.e. not sheltering occupants from nature, but creating a new expanding space that make **occupants a part of nature**.

"Correspondingly, the architect becomes more important than ever. The **dwelling 'as a work-of-art'** is a better place in which to be alive, to live with, and live for and by in every sense. Therefore, why not a better 'investment'? The interest of architect and owner are thus mutual and binding upon both."

"**Building is an organism** only if in accord outside with inside and both with the character and nature of its purpose, process, place and time. It will then incorporate nature of the site, of the methods by which it is constructed, and finally the whole - from grade to coping, ground to skyline - will be becoming to its purpose."

~~"If one would get the essential character of an **organic building**, it could not be by camera. One must be in the building before he can understand what makes it what it is (senses other than visual, can not be experienced through photograph). The essence of organic building is space, **space flowing outward**, space flowing inward (not necessarily by the use of the picture window). Both plan and construction are seen to be **inspired from within**. Only when the buildings are comprehended from within and each in its place a feature of its own special environment—serving its own appropriate purpose with integrity—are they really seen."~~

"The character of the site is always fundamental to organic design, but fortified enclosure (walls) is no longer needed, nor is it now often desirable."

Just as Wright popularized **open plan**, he foresaw the desire for the **open building, living with the environment**, outdoors flowing into the building (outdoor seating, outdoor kitchens, outdoor day beds, outdoor showers, outdoor living). 2023.10.31 6:31am oo

"We don't use organic as referring to something hanging in a butcher shop. ■■■

Organic meant in philosophic sense, Entity is the ideal, from **within outward**, where the **whole is to the part, as the part is to the whole**. Where the nature of the **material, is the nature of the purpose**. The nature of the entire performance becomes **a necessity**, and out of that comes **a significance** you can give as a creative artist."

"A natural architecture is not an eclectic architecture, something you pick up by way of taste and apply to the thing. You'd **go into the nature, study its circumstances**, and come out with this thing from within."

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FLW innovations:

1. **New sense of space**, as result of the building.
2. **Streamlined**.
3. **Open plan**.
4. **Structural tenuity**. (tensile continuity)
5. **Gravity (radiant) heat**.

"If you sit warm, feet warm, your warm"

6. Corner window.

7. **Indirect lighting**

"Doing nearly everything that is being done today. I don't know of anything new."

December 1934 Wright visits site

Sept. 1935 Kaufmann visits Wright

Construction Documents until March 1936

Start construction April 1936 thru Dec. 1938

Guest house 1939

Oct.29, 1963 Edgar Kaufmann Jr. presented house to Western Pennsylvania Conservancy, along with 1,543 acres of surrounding land.

2001-2002 restoration (including structure)

9,300-square-foot main house, including **4,400 square feet of terraces**. Wright designed an additional **4,990-square-foot guest house** (1939) with **1,950 square feet of terraces**.

Surrounded by **1,543 acres of natural land**, the architecture is integrated with the spirit of its awe-inspiring environment. While its form is distinct and stand out, Fallingwater was designed for a family to live in and among nature.

After living in the **vacation home for 26 years**, the Kaufmann family gave its custody to region's Western Pennsylvania Conservancy in 1963.

135K visitors per year, more than **6.4 million visitors** have visited Fallingwater since it opened as a public museum in 1964.

Wright to **Kaufman**: "Definition of **a client**: a timid sheep always in a huddle, looking for a shepherd."

Kaufman to Wright: "I don't know what kind of clients you are familiar with, but apparently they are not the kind I think I am."

"First of all, the family is designed for. The **house is part of its environment** and if successful, **can't image it anywhere than where it is.**" = Fallingwater ■■■

Robert Mosher, within Taliesin fellowship, did **early supervision** of **Fallingwater**. **Edgar Tafel**, only arriving four years earlier at Taliesin, completed the work from the **second level and above** (bedrooms).

Lower level: **in stream**

Living level: **above stream**

Bedroom level: **forest canopy**

Penthouse level: **sky view**

Guest house built for overflow of guests. Original house with separate bedrooms for Mr. and Mrs., only had one guest room (bedrooms, living spaces and private exterior terrace for four servants in lower level), two if Jr. was not home. Guest pool designed in 1938, but added later. Guest house with four bedrooms, sleeping six.

1947 Wright designed an addition, a garage at the upper level, which was never built.

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~~“**What is (modern) architecture?** I know that **architecture is life**, or at least it is **life itself taking form** and therefore it is the **truest record of life as it was lived** in the world yesterday, as it is lived today or ever will be lived.”~~

~~“Architecture is that **great living creative spirit** which from generation to generation, from age to age, **proceeds, persists, creates, according to the nature of man**, and his circumstances as they change. That is really architecture.”~~

~~“The time is here for architecture to recognize its own nature; it must again become the most human of all expressions of human nature. Architecture is a necessary interpretation of such human life as we now know, if we ourselves are to live with **individuality and beauty**.”~~

~~“The law of organic change is the only thing that mankind can know as beneficial or as actual. We can only know that all things are in process of flowing in some continuous state of becoming.”~~

~~[Organic Architecture, 1939]~~

3:05

~~"Is there to be no true vision of whatever superior possibilities may exist for us in our new world besides these abortive boxes endeavoring to look tall? Can it be that the ultimate chapter of this new era of **democratic freedom** is going to be deformed by this **growing drift toward conformity** encouraged by politics and sentimental education? **Machine standardization** (Corbusier and Mies) is apparently growing to mean little that is inspiring to the human spirit (Wright use of new materials to create buildings not possible with previous materials: cantilever. Use of materials, more than the production of materials). Everything as now **professionalized**, in time dies spiritually."~~

~~"**Democracy** knows only too well the senseless weight and conflicts of irresponsible public opinion, the chronic oralism, the dead weight of ignorance, the prejudices of conditioned minds siding right or left with selfish interests of hearts hardened—instead of the deep faith in Man necessary to inspire enlightenment by generosity of motive, which democracy meant to our forefathers and must yet mean to us. The common sense of the simple truth in this new old philosophy, from **within outward**, if awakened in our society as now in our architecture, would ensure the **true uses of technology** for human **shelter** and reverential harmonious environment, both socially and politically."~~

~~"The basic distinction between the **curious** and the **beautiful**, in which culture really consists, will make all the difference between a society with a creative soul and a society with none."~~

