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Why the Great Earthquake Did Not Destroy the Imperial Hotel

By FRANK LLOYD WRIGHT

FROM INFANCY, as a sort of subjective contemplation, the minds and hearts of the Japanese are fixed upon the great calm mountain God of their nation—the sacred Fujiyama brooding in majesty and eternal calm over all. They deeply worship as the mountain continually changes moods, combining with sun and moon, clouds and mist in a vast expression of elemental beauty the like of which in dignity and repose exists nowhere else on earth.

It is not too much to say that the "sacred mountain" is the God of old Japan: Japan the Modern Ancient.

And yet the dreaded force that made the great mountain continually takes its toll of life from this devoted people, as the enormous weight of the deep sea beside their tenuous island, the deepest sea in the world, strains the earth-crust opening fissures in the bottom of the great valley in which it rests and the sea rushes down to internal fires to become gas and steam expanding or exploding internally causing earth convulsions that betray the life on the green surface.

Great wave movements go shuddering through the body of their land spasmodically changing all overnight in immense areas. Whole villages disappear. New islands appear as others are lost and all on them. Shores are reversed as mountains are laid low and valleys lift up. And always flames! The terror of it all invariably faces conflagration at the end.

Trained by these disasters of the centuries to build lightly on the ground—the wood and paper houses natural to them may be kindled by any spark. When fire starts it seldom stops short of several hundred homes and usually thousands, or complete destruction. So, when the earthquake is violent, fire finishes the terrible work.

The dead, not swallowed up, are buried, and once more "Shikata-gai-nai," (it can not be helped) goes patiently on as before. Naturally the earth-waves seem fate and unconquerable. A force useless to combat by strength alone, for it is mightier than any force at man's command. Shikata-gai-nai! This stoicism I have seen and lived with four years or more while preparing to meet this awful force by building on ground which the seismograph shows is never for a moment still—prepare to meet it by other means than rigid force.

The "foreigner" with the advent of Commodore Perry came to share Japanese joys and sorrows and soon a building was needed to shelter the "foreign" element in Tokio, the capital of Japan.

A social clearing house became necessary to official Japan, as a consequence of the new foreign interest in them, because, for one reason, no foreigner could live on the floor. The

This story of one of Frank Lloyd Wright's greatest achievements forms a part of his forthcoming An Autobiography, *which Messrs. Longmans, Green & Co. will publish in the near future.*

need steadily increased. At that time the Mikado took it upon himself to meet the need, and asked the Germans to build one of their characteristic national wood and plaster extravaganzas for the purpose.

That wretched marvel grew obsolete and the need of another, a great one, imperative. The Imperial household, this time, proposed to share the task of providing the new accommodation with the capitalists of the Empire, ship owners, cement manufacturers, bankers, tobacco interests, etc., and I, an "American," was chosen to do the work.

No "foreigner" yet invited to Japan had taken off his hat to Japanese traditions. When foreigners came, what they had back home came too, suitable or not. And the politely humble Japanese, duly impressed, took the offering and marveled. They tried to do likewise in their turn.

And yet, Japanese fine-art traditions are among the noblest and purest in this world, giving Chinese origins due credit.

It was my instinct not to insult them. The West has much to learn from the East—and Japan was the gateway to that great East of which I had been dreaming since I had seen my first Japanese prints—and read my first "Laotze."

But this terrible natural enemy to all building whatsoever—the temblor!

The terror of the temblor never left me while I planned the building nor while, for more than four years, I worked upon it. Nor is any one allowed to forget it — sometimes awakened at night by strange sensations as at sea, strange unearthly and yet rumbling earth-noises. Sudden shocks, subsidence—and swinging. Again shock after shock and upheaval, jolting back, and swinging. A sense of the bottom falling from beneath the building, terror of the coming moments as cracking plaster and groaning timbers indicate the whole structure may come crashing and tumbling down. There may be more awful threat to human happiness than earthquake—I do not know what it can be.

The Japanese turn livid, perspiration starts on them, but no other signs unless the violence becomes extreme, then—panic. I studied the temblor. Found it a wave-movement, not of sea but of earth — accompanied by terrific shocks no rigidity could withstand.

Because of the wave movements, deep foundations like long piles would oscillate and rock the structure. Therefore the foundation should be short or shallow.

There was sixty to seventy feet of soft mud below the upper depth of eight feet of surface soil on the site. That mud seemed a merciful provision—a good cushion to relieve the terrible shocks.

Why not float the building upon it? A battle ship floats on salt water.

And why not extreme lightness combined with tenuity and flexibility instead of the great weight necessary to the greatest possible rigidity?

Why not, then, a building made as the two hands thrust together palms inward, fingers interlocking and yielding to movement—but resilient to return to original position when distortion ceased? A flexure—flexing and reflexing in any direction.

Why fight the quake?

Why not sympathize with it and out-wit it?

That was how the building began to be planned.

The most serious problem was how to get the most carrying power out of that eight feet of cheese-like soil that overlay the liquid mud. During the first year of plan making, I made borings nine inches in diameter eight feet deep and filled them with concrete. Arranged to test the concrete pins thus made. Got carloads of pig iron and loaded the pins until they would

drive into the ground. Kept the test figures of loads and reactions. Took borings all over the site to find soft pockets. Water stood in the holes two feet below the surface, so the concrete had to go in quickly as the borings were completed. Later, tapered piles were driven in to *punch* the holes and pulled out—the concrete thrown directly in as soon as the pile was out of the way.

This data in hand—the foundation plan was made to push these concrete pins in, two feet on centers each way over the entire areas on which the wall footings were to spread. The strength of the whole depth of eight feet of top soil was thus brought to bear at the surface. That was simple.

But here was a compressible soil that might take a squeeze under the broad footings to add to the friction of the pins. Experiments showed the squeeze could safely be added to the fric-

tion. This meant a settlement of the building of five inches the building itself driving the piles that much deeper. This was economy but dangerous and more complicated.

But finally the building was computed pound by pound and distributed according to "test data" to "float" below the grade of the ground surface—and it did. With some few slight variations it stayed level there.

This foundation saved hundreds of thousands of dollars over the foundations then in use in Tokio. But had the owners of the Imperial superficially known what was contemplated something might have happened to prevent it. "Rumor" nearly did prevent it. Here, however, was the desired shock-absorber, a cushion, pins and all to be uniformly loaded and put to work against the day of reckoning.

Now how to make the flexible structure instead of the foolish rigid one? Divide the building into parts.

Where the parts were necessarily more than sixty feet long, joint these parts clear through floors, walls, footings and all, and manage the joints in the design. Wherever part met part, through joints also.

So far, good sense, and careful calculation.

But a construction was needed where floors would not be carried between walls because subterranean disturbances might move the walls and drop the floors.

Why not then carry the floors as a waiter carries his tray on upraised arms and fingers at the center—*balancing* the load. All supports centered under the floor slabs like that instead of resting the slabs on the walls at their edges as is usually the case?

This meant the cantilever, as I had found by now. The cantilever is most romantic—most free—of all principles of construction and in this case it seemed the most sensible. The waiter's tray supported by his hand at the center is a cantilever slab in principle. And so concrete cantilever slabs continuous across the building from side to side, supported in that way, became the structure of the Imperial Hotel at Tokio.

Roof tiles of Japanese buildings in upheavals have murdered countless thousands of Japanese, so a light hand-worked green copper roof was planned. Why kill any more?

The outer walls were spread wide, thick and heavy at the base, growing thinner and lighter toward the top. Whereas Tokio buildings were all top heavy. The center of gravity was kept low against the swinging movements and the slopes were made an aesthetic feature of the design. The outside cover-hangs of the cantilever slabs where they came through the walls were all lightened by ornamental perforations enriching the light and shade of the structure. The stone everywhere under foot in Tokio was a workable light lava weighing as much as green oak. It was "sacrilege" to use this common material for the aristocratic edifice. But finally it was used for the feature material and readily yielded to any sense of form the architect might choose to indicate. And the whole structure was to be set up as a double shell, two shells an exterior of slim cunning bricks, and an interior one of fluted hollow bricks raised together to a convenient height of four feet or more. These shells were to be poured solid with concrete to bind them together.

The great building thus became a jointed monolith with a mosaic surface of lava and brick. Earthquakes had always torn piping and wiring apart where laid in the structure and had flooded or charged the building. So all piping and wiring was to be laid free of construction in covered concrete trenches in the ground of the basements independent even of foundations. Mains and all pipes were of lead with wiped joints the lead bends sweeping from the trenches to be hung free in vertical pipe shafts, from which the curved lead

branches were again taken off, curved, to the stacks of bath-rooms. Thus any disturbance might flex and rattle but could not break the pipes or wiring.

Last but not least there was to be an immense reservoir or pool as an architectural feature of the entrance court—connected to the water system of the hotel and conserving the roof water.

Thus the plans were made so that all architectural features were practical necessities, and, the straight line and flat plane were respectfully modified in point of style, to a building respectful to the traditions of the people to whom the building would belong. The *nature* of the design too, I wanted to make something their intensive hand methods could do well because we didn't know what machinery could be used. It was impossible to say how far we could go with that. Probably not very far.

Finally the plans were ready.

No estimates could be had.

It was all so unfamiliar, no commercial concern would touch it. Nothing left but to abandon the whole or organize to build it ourselves. The Imperial Hotel and its architect and builder.

The language was a barrier. The men and methods strange.

But the "foreign" architect with eighteen or twenty architectural students from the Japanese universities, several of whom were taken to Wisconsin during the plan-making period, and one expert "foreign" builder, Paul Mueller of Chicago, two "foreigners," all else *native*, we organized with the hotel manager, Hayashi-san, as general manager. We had already bought pottery kilns in Shizzvoka and made the long slim cunning bricks of a style and size, never made before, for the outside shell. They were now ready to use.

We had also made the fluted hollow-bricks for the inside shell, the first in the Empire. We bought fine lava-quarry at Oya near Nikko for the feature-material and started a flood of dimension stone moving down to the site in Tokio — a stream that kept piling into the building for four years. The size of the hole left in the ground at Oya was about like the excavations for the Grand Central Terminal.

We had a hundred or more clever stone "choppers" beating out patterns of the building on the greenish, leopard-spotted lava, for that period.

On an average we employed about 600 men continually for four years.

There was a warmth of appreciation and loyalty unknown in the building circles of our country. A fine thing to have experienced.

The curse of the work was the holiday. There were no Sundays but a couple of holidays every fortnight instead, and it took a day or two to recover from most of them. So the work dragged.

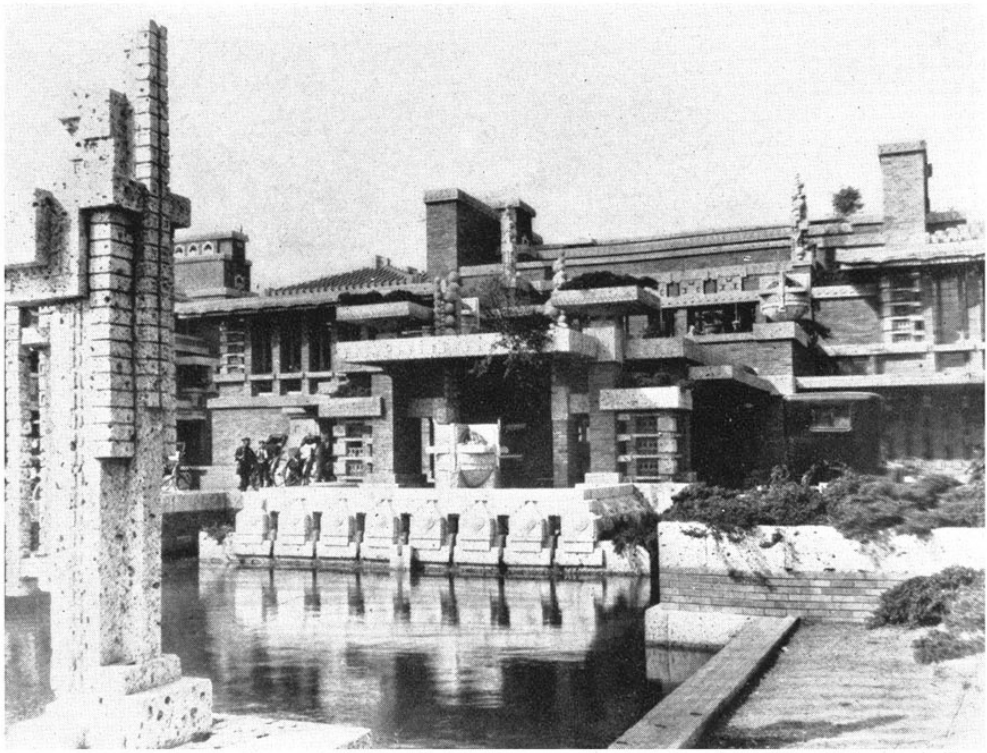
And the rainy season! The Japanese say it rains up from the ground as well as down from the sky—in Tokio.

We did succeed in abolishing the expensive cover-shed of tight roof and hanging matting-sides under which most buildings are built in Japan. We congratulated ourselves until we found they knew their climate better than we did. Had we protected them from the rain and burning sun the buildings would have been finished about seven months sooner—besides making all more comfortable and so more efficient.

A few more such "successes" would have been enough.

The "directors" met regularly for a couple of years and began to complain.

Rumors reached them from the English (the English love the Americans in Tokio) and "Americans" (why are "Americans" invariably so unpleasant to one another abroad) to the effect that the architect of their building was



Entrance Portico, Imperial Hotel, Tokio *Courtesy of Philip Johnson, Esq.*

mad. In any earthquake the whole thing would tumble apart—and the whole building would sink out of sight in the mud beneath. There was room enough for it in that cushion of mud.

Where all had been pleasant enthusiasm things began to drag. The loyalty of my own office force never for a moment wavered, but manager Hayashi was daily hectored and censured.

At this crucial time it became apparent that three and a half million yen more, would be necessary to complete and furnish the work. Things looked dark.

By now a small army was working away in the lower stories of the building as it was completed. As soon as one portion was built it became a hive of frantic industry. The copper features and fixtures and roof tiles were all made there; the interior wood work and furniture — the upholstery and many other things went on in the vast interior spaces as soon as the floor slabs covered them over.

I had brought examples of good furniture from home and took them apart to teach the Japanese workmen how to make them according to the new designs which made them all part of the structure. They were fine craftsmen at this. Rug designs had gone to Pekin. The rugs were being woven there to harmonize with the interior features of the great rooms and the guest rooms.

We were about two-thirds of the way over with the building itself. The foreigners had no way of keeping track of costs or finding out much about them in detail. So things had gone on for several years.

The crash came.

The directors were called together.

Baron Okura was chairman of the board—representing, besides his own inteests, the interest of the Imperial Royal Household, sixty per cent, besides ownership of the ground.

There was also, Asano-san—a white haired Samson of the shipping interests, a powerful man with shaggy white brows and piercing eyes. Murai of the tobacco interests—a peacemaker and with pleasant ways, always. Wakai, the banker, as broad as he was long with a beard that reached below the table when he stood up. Kanaka and half a dozen others.

Baron Okura had rather sponsored me from the beginning. He was in trouble now.

The meetings had been held in the old hotel building and were pleasant social affairs with refreshments.

This one was not. It was black. A long time, it had been threatening. The Baron, a black-haired youth of eighty—a remarkable man regarded as one of the astute financial powers of the Empire, sat at the head of the table. I sat on his left. On his right sat his cultivated secretary, a Harvard graduate who was interpreter. It doesn't matter where the others were. They were there and all talking at once. I answered leading questions without end. The foundations. Always the foundations—and the money. The money!

The Baron was patient and polite—for some time. His lower lip had a trick of sticking out and quivering when he became intense. This personal idiosyncrasy of his was evident now.

Suddenly he rose—leaned forward, head thrust forward, angry, hissing, pounding the table with both fists—extraordinary conduct for him.

The crowd went back and down as though blown down by the wind.

There was silence—the Baron still standing looking over toward me. Not knowing what it was all about I instinctively rose. The interpreter rose, too, and said, "The Baron says that if the 'young man' (all things are relative) will himself remain in Japan until the building is finished, the Baron will himself find the necessary money and they could all go to"—whatever the Japanese word is for the place they could go to.

Although homesick by now and sick besides I reached out my hand to the Baron. The compact was made. The meeting was over. The directors filed out red and angry to a man, instead of happy to have the responsibility lifted from them.

Was it Pericles who enacted some such role as the Baron's when the Parthenon was building?

And the building of the new Imperial went on.

But now every director became a spy. The walls had ears. Propaganda increased. My freedom was gone. I worked under greater difficulties than ever. But my little band of Japanese apprentices was loyal and we got ahead until another storm broke.

"Why not," said the directors to the Baron, "eliminate the pool and save 400,000 yen." The Baron saw sense in this and sent for me. His mind was made up. No arguments took effect. I told him via interpreters that it was the last resource against the quake. In disaster, the city water would be cut off, and the window frames being wood in the 500 foot building front along the side street where wooden buildings stood, fire could gut the structure even though it withstood the quake. I had witnessed five terrible fires in Tokio already—walls of flame nothing in any degree inflammable could withstand.

No matter. The pool must come out. No, I said, it is wrong to take it out and by such interference he would release me from my agreement and I could and would go home, with no further delay. And I left his office. But I did not leave Tokio and the pool went in to play its great part in the great drama of destruction that followed two years later.

Another year and I could go home. The Tokio climate, so moist and humid summer and

winter, depressing except in fall and early spring, together with the work and anxiety were wearing me down.

But now came a terrible test that calmed troublesome fears and made the architect's position easier.

The building construction was about finished. The architect's work-room had been moved to the top of the left wing above the promenade entrance. It was nearly noon. The boys in the office, reduced to ten, were there, and workmen were about. Suddenly with no warning a gigantic jolt lifted the whole building, threw the boys down sprawling with their drawing boards. A moment's panic and hell broke loose as the wave motion began. The structure was literally in convulsions. I was knocked down by the rush of workmen and my own boys to save their own lives. It is a mercy there were not more workmen in the roof space beyond or I should have been trampled out. As I lay there I could clearly see the "ground swell" pass through the construction above as it heaved and groaned to hideous crushing and grinding noises. Several thunderous crashes sickened me but later these proved to be the falling of five tall chimneys of the old Imperial left standing alone by the recent burning of that building.

At the time it seemed as though the banquet hall section, invisible just behind the workroom, had crashed down.

Only one faithful assistant stayed through this terrible ordeal. Endo-san, loyal right-bower—white to the teeth—, perspiring. Otherwise the building was utterly deserted. We got up shaking to the knees and went together out onto the roofs. There across the street were crowds of frightened work-men. They had thrown down their tools and run for their lives, even those working in the courts. There they all stood strangely silent, pasty-faced, shaking. A strange silence too was everywhere over the city. Soon fires broke out in a dozen places—bells rang and pandemonium broke—women dragging frightened children, ran weeping and wailing along the streets below.

We had just passed through the worst quake in fifty-two years. The building was undamaged. A transit put on the foundation levels showed no deviation whatever.

The work had been proved.

Hayashi San, when reports of the damage to the city and none to the building came in, burst into tears of gratitude. His life had barely been worth living for more than a year, so cruel were the suspicions and harassing the doubts.

The year passed. The building was now so nearly complete there was no longer pressing need for the presence of the architect.

Another wing remained to be finished but it was a duplication of the one already done and furnished. So I could go home with a good conscience. My clients, headed by the Baron, were generous, added substantial proof of appreciation to my fee, and I was "farewelled" at a champagne luncheon by the Baron and his directors; at a tea house entertainment by the building organization itself, all with unique expression of esteem; by the workmen at another characteristic entertainment—all as usual in such matters.

The day of sailing came. To get to my car I had to pass from the rear through the new building to the front. All was deserted and I wondered. Arrived at the entrance courts, there all the workmen were, crowding the spaces, watching and waiting. Already there had been gratifying evidence of appreciation—I thought, but here was the real thing. This could have happened nowhere but in Japan. Here was the spirit of the old Japan I had tried to compliment and respect in my work.

As their architect came out they crowded round, workmen of every rank from sweepers

to foremen of "the trades," laughing, weeping, wanting awkwardly to shake hands—foreign fashion. They had learned "aw-right," and mingled it now with "arigato" and "sayonara Wrieto-san."

Too much, and "Wrieto-san" broke. They followed the car down along Hibiya way to the station, running, shouting "Banzai, Wrieto-san, banzai!"

The dock at Yokohama, eighteen miles away, was reached by train, to find that sixty of the foremen had paid their own way down from Tokio to shout again and wave good-bye, while they faded from sight as the ship went down the bay. Such people! Where else in all the world would such touching warmth of kindness in faithfulness be probable or possible?

Two years later — 1924 — in Los Angeles. News shouted in the streets of terrible disaster. Tokio and Yokohama wiped out! The most terrible temblor of all history!

Appalling details came day after day. Nothing human it seemed could have withstood the cataclysm.

Too anxious to get any sleep, I tried to get news of the fate of the New Imperial, Shugio, Endo, Hyashi, the Baron, and the hosts of friends I had left over there. Finally, the third night, about two in the morning, the telephone bell rang. The "Examiner" wished to inform me that the Imperial Hotel was completely destroyed. My heart sank, but I laughed, "how do you *know?*" They read the despatch, a list of Imperial University, Imperial Theatre, Imperial Hospital, Imperial this and Imperial that. "You see," I said, "how easy it is to get the Imperial Hotel mixed with other Imperials? I am sure if anything is above ground in Tokio it is that building. If you print its destruction as 'news' you will have to retract."

Their turn to laugh and hang up the receiver.

Ten days of uncertainty and conflicting reports, for during most of that time direct communication was cut off.

Then a cablegram . . .

FOLLOWING WIRELESS RECEIVED FROM TOKIO TODAY HOTEL STANDS UNDAMAGED AS MONUMENT OF YOUR GENIUS HUNDREDS OF HOMELESS PROVIDED BY PERFECTLY MAINTAINED SERVICE CONGRATULATIONS SIGNED OKURA IMPEHO

For once good news was news, and the Baron's cablegram flashed around the world to herald the triumph of good sense.

Both the great Tokio homes of the Baron were gone. The splendid museum he gave to Tokio and all its contents destroyed. The building by the American architect, whose hand he took and whose cause he sponsored, was all he had left in Tokio—nor could love nor money now buy it or buy a share of stock in it.

When the letters began to come and nearly all the friends were found to be safe, the news most gratifying to the architect was the fact that after the first great quake was over, the dead rotting in unburied heaps, the Japanese in subsequent shocks had come in droves, dragging their children into the courts and onto the terraces of the building, praying for protection by the God that had protected that building as the wall of fire driving a great wail of human misery before it, came sweeping across the city toward the long front of the building: the hotel boys formed a bucket line to the big pool, water there the only water available anywhere, and kept the window sashes and frames on that side wet to meet the flames that came leaping across the narrow street.

The last thought for the safety of the New Imperial had taken effect.