

Figures That Give an Idea of the Magnitude of a Modern Skyscraper

NEW YORK, June 27.—Did it ever occur to you that if one of New York's modern skyscrapers, say the Metropolitan Life or the Singer building with its slow revolving tower, could be picked up bodily and dropped on some prairie there would be practically everything needed to start a little city, including the population? In fact, when it came to building materials there might, in some instances, be stuff left over for use in neighboring towns.

Take the Singer building, for instance. It contains 135 miles of various kinds of metal piping. The telephones, elevators, electric lights, fans and clocks require 3.42 miles of wire, which, if stretched out, would extend from the top of the Singer building to the top of Mt. Elbert tower in Paris, with 300 miles left over.

The steel used in the construction of the Singer building, if made into three-quarter-inch wire cable, would reach from New York to Buenos Ayres, a distance of 7,100 miles. The total length of the steel bearing columns in the building is about ten miles.

The terra cotta floor blocks in the building, if spread out on a plain, would cover 8.25 acres. Placed end to end they would extend ninety-seven miles, or further than from New York to Philadelphia. The fire-proof blocks in the partitions placed end to end would reach from New York to Saratoga.

The new skyscraper contains 5,325,959 bricks, and these laid end to end would reach 66 miles, from New York to Detroit. They would pave a foot path twelve inches wide from New York to Boston.

This modern skyscraper contains 101 tons of sheet copper, enough to cover 4.64 acres. The copper combined with the stately bronze in the building would yield a metal similar to that used by the United States government in making cents, and that prairie town would certainly have money to lend to its neighbors if the combined metals were put to that use. It would be possible to turn out 4,256,000 cents, or \$42,560.

If the concrete in the foundations of the building were all loaded on two-horse trucks it would make a continuous line of 10,130 trucks, thirty-eight miles long, or twice the distance from the Singer building to Yonkers.

The steel in the building would make 115 large type mogul locomotives; that is, a continuous line of engines for a mile and a half. It would make a seventy-four-mile stretch of heavy modern track, rails, spikes and the pieces. Made into elevator cables it would extend 7,100 miles, and if the total length of all the strands of wire in the cable were put together they would reach from the earth to the moon three and one-third times, or 839,490 miles.

If the steel were rolled out into a plate a quarter of an inch thick it would cover an area of fifty acres. In other words, Broadway from Liberty street to Seventy-second street could be paved with steel plate of that thickness.

There is 13.4 miles of picture moulding in the building. If all the mouldings for the doors, pictures and windows were put in a straight line they would reach sixty miles, or from New York to Bridgeport, Conn.

More than 1,541 tons of mortar was used in the masonry. This would make a path fourteen inches wide and one inch thick from New York to Washington, a distance of 240 miles. About 37 tons of paint was used on the various surfaces. That is enough paint to cover ninety and a half acres with one coat. It would cover a board fence six feet high from New York to Springfield, 128 miles, with one coat.

There are 25.4 miles of wall area in the new skyscraper. This is plaster enough for about 300 good-sized dwelling houses. It would make a line of plaster twelve inches wide from New York to Boston.

The glass in the building, 85,203 square feet, would make a continuous show window six feet high on one side of Broadway from Liberty street to Thirty-fourth street. There are 256,000 square feet of metal lath, or 5.3 acres. To support these laths 49.1 miles of structural angle irons were required, together with 130 miles of tying wire and 130,000 bolts.

There are 8.5 miles of elevator cables in the building and nine fans capable of

blowing 6,820,000 cubic feet of air in an hour, which would make it possible for an ordinary-sized town almost to generate its own tornado.

Almost any little city would be satisfied with the heating plant in one of New York's modern skyscrapers. In the Singer building there are 14,500 incandescent lamps, while on the outside of the forty-seven-story tower are 1,800 more.

These, together with the searchlights which play on the tower from the roof of the main building, make the skyscraper visible in bold relief at night for a distance of twenty miles. The rays of the powerful searchlight in the lantern crowning the tower are visible seventy-five miles away.

The lighting system of the Singer building represents a capacity of 278,530 candle-power. The boilers of the building, to generate light, heat, power, etc., must yearly generate 150,000,000 pounds of steam. This will take 18,000,000 gallons of water and 8,000 tons of coal.

The lower elevator cars travel about 370 feet a minute. With the building fully well filled the cars will travel six miles daily and make a yearly total of 1,8720 miles, or about four times the distance around the earth. The length of the highest elevator shaft is 545 feet nine inches, the tower from curb to roof being 612 feet.

There have been expended in the construction of the Singer building about 100,000 days labor. One man would have a job lasting 2,000 years if he cared to tackle it alone.

The Metropolitan Life building, when it is completed, will afford much larger figures than these. The tower will not only be eighty-three feet higher than the Singer structure but is of larger proportions all the way through.

Its gross weight will be 84,000,000 pounds, or 37,823 tons, which is about twice as much as the gross weight of the Singer tower. The Singer tower is sixty-five feet square, whereas the new Madison Square

structure is 75 by 85 feet. The Metropolitan tower walls will be of marble from top to bottom, while the Singer tower has corners of brick and terra cotta and central panels of metal and glass. This will, of course, account in part for the large difference in gross weight.

The new Metropolitan tower will be 700 feet high from curb to pinnacle. The steel work in nearly all up now, as is shown in the picture above. The highest lookout in the Singer tower accessible to the public is the lantern balcony, which is 668 feet

above Broadway. The highest point for observation in the Metropolitan tower will be a window over the lookout 660 feet above the sidewalk.

One of the chief features of this Metropolitan tower will be a huge clock with a face on each side of the tower 324 feet above the sidewalk. The face of the clock will be two stories high, twenty-five feet six inches in diameter on the dial. It will have figures four feet in length and hands twelve feet long.

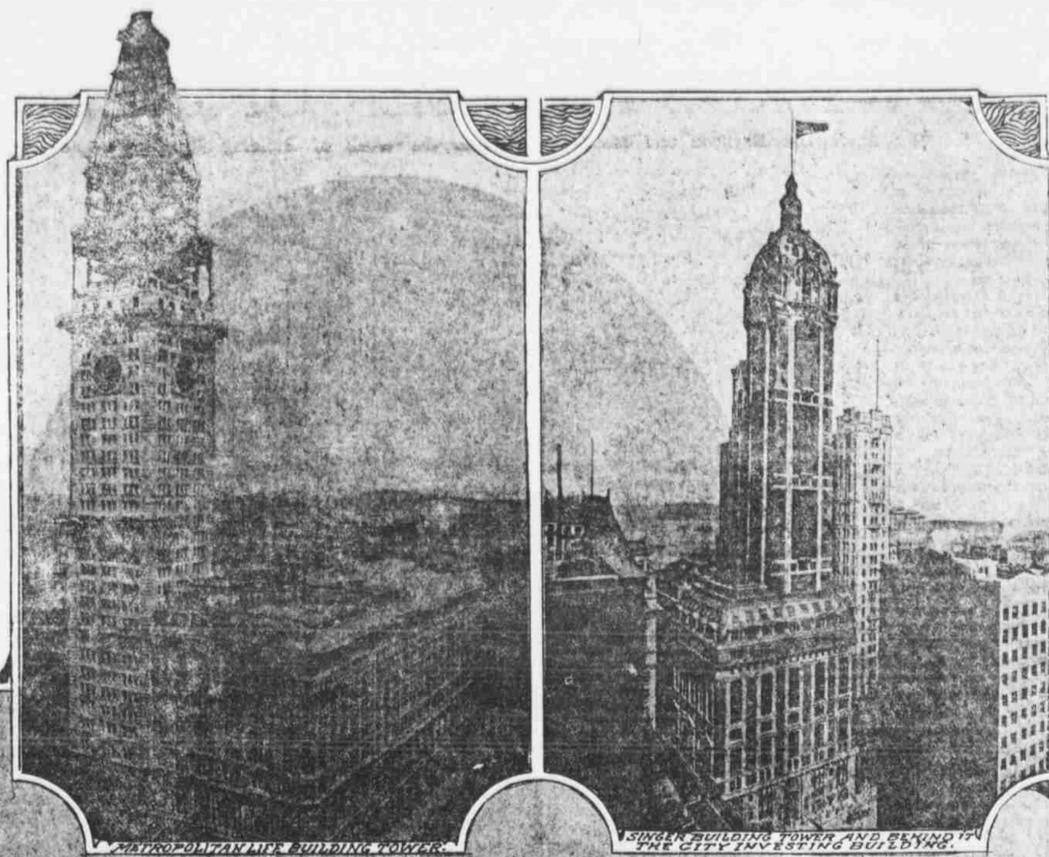
Two stories above the clock will be a line of projecting balconies and above this a series of Ionic loggias showing five arched openings on each face of the tower. The height of these loggias will be fifty feet.

As you approach the city from the sea it makes you think of southern Europe. The shore is lined with three-story buildings, built of stone and brick, covered with stucco and painted in all colors of the rainbow. There are blue buildings, white buildings, green buildings and yellow buildings, all mixed together. The town appears twice as big as it is, and it looks both imposing and beautiful. Right out of the center, on the edge of the sea, rises the sultan's palace, and farther down to the south are the buildings of the British consulate, which look like a white marble castle.

As you come nearer the marble turns to whitewash; and the sultan's palace dwindles in grandeur until it looks like one of our great seaside hotels. It is, in fact, a three-story building of wood painted yellow, with galleries running about it from story to story. These galleries are about twenty feet wide and they are for all the world like hotel porches. The roof is red, and, as it seems to cover a roof garden, the hotel effect is still more in evidence. It is there that the sultan lives with his numerous wives. I do not know how many dusky ladies there are in the harem. His majesty is a Mohammedan and he keeps such things to himself. I only know that the soldiers are always guarding the doors and that the cannon at the entrance seems to frown at me as I passed by. There is no royalty, however, about the looks of the palace, and there is but little power in the hands of the young man of 23 who lives there and pretends to reign.

Sultan of Zanzibar. Indeed the glory of this sultanate is fast passing away. It once controlled almost the whole of East Africa. The sultan had all the territory that now belongs to the Germans, reaching as far east as Lake Tanganyika, and also the whole of the coast lands of British East Africa, extending almost to Arabia. He was one of the greatest slave dealers in the world. I recently went through the slave market where some of this young sultan's ancestors sold negro slaves for American consumption, and I stopped in a hotel named after Tippu Tib, the great slave dealer who aided Stanley in his explorations. When Tippu Tib died not long ago he left more than 200 black wives. Within recent years the British have abolished slavery, but I understand that there are some who are still slaves, although nominally free.

As to the Sultan of today his income is largely from the British government, and from his own private estates. The British hold the protectorate over his dominions on a perpetual lease, for which they pay



CROSS MARKS SITE OF SINGER BUILDING AS IT WAS IN 1679.

Concerning the Island of Cloves and Its Young Mohammedan Sultan

ZANZIBAR.—(Special Correspondence of The Bee.)—Have you ever heard of Judge Riley of Virginia? He was one of the noted figures in Washington during the administrations of Grant, Hayes, Arthur and Garfield. A carpet bag official at the close of the war, he came in for one of the foreign appointments which were given by the northern presidents to the republicans of the south. He was first sent as minister or consul general to one of the little South American republics and after that was given the consulship to Zanzibar. Before leaving Washington for the latter post he treated all his friends, dilating the while on the splendors of the court of the sultan and his harem and the black-eyed beauties whom he expected to see. He then left; but at the end of six months came back weary and worn and sad. When asked how he liked Zanzibar he replied:

"Zanzibar! Zanzibar! Where in the blank is Zanzibar! I have been cruising over the world for the past six months and, for the life of me, I can't find Zanzibar!"

I have been more successful than Judge Riley, for I have found Zanzibar, and have even seen its young sultan, though not his harem. For our consuls of the future I would say that Zanzibar is a coral island

about one-sixth as large as Porto Rico, situated in Indian ocean, 300 or 400 miles below the equator and from fifteen to thirty miles from the coast of German East Africa. It can now be reached by a half dozen steamship lines, and the fare from here to Washington is something like \$80. There are four lines which connect the island with Europe, and the German East Africa ships go regularly from here to Bombay, in India, and to Rangoon, in Burma. There are also ships which have regular sailings to the Persian gulf and Madagascar, so that the island can be easily reached.

Island of Cloves. In coming here from TANZA we steamed along the Zanzibar coast for about forty miles, and there are twenty or more miles yet below us. Zanzibar is about fifty miles long and twenty miles wide, and it would make altogether about 990,000-acre farms. As you look at it from the sea the land is low and its shores are fringed with coconut trees loaded with nuts. The island has a dense vegetation. It is in the heart of the tropics and is noted for the fertility of its soil. It is the chief clove island of the world, and the cakes and pickles of the universe are flavored by it. Throughout Europe and the United States the are mil-

lions of secret drinkers who hide their whiskey breath from the knowledge of their deluded wives by the aroma of Zanzibar cloves. The island produced last year over 20,000,000 pounds of these spices. This is enough to smother the scent of all the liquors raised by man and leave some to spare.

During my stay I have ridden out to some of the plantations. Cloves come from trees which are set out in orchards and cultivated. At the age of 6 years the trees begin to bear blossoms, and it is these blossoms which form the cloves of commerce. They are bright red in color and are full of perfume. They are picked when they are in full bloom and then smoked over slow wood fires. During the smoking they turn from red to brown, and when cured are almost black. After they are well dried they are packed up in bags, and in that shape are sent to Europe and the United States. The English have another clove island, known as Pemba, which lies a little north of Zanzibar, and is governed from here. These two islands produce more than 90 per cent of all the cloves raised in the world.

Zanzibar City. The capital of Zanzibar is Zanzibar City. It is the chief port of East Africa, foreign

goods being sent from here to the mainland and carried across to Lake Tanganyika and other parts of the continent. At the same time ivory, hides and the various native products are brought here to be shipped to Europe, so that the place has a great trade.

As you approach the city from the sea it makes you think of southern Europe. The shore is lined with three-story buildings, built of stone and brick, covered with stucco and painted in all colors of the rainbow. There are blue buildings, white buildings, green buildings and yellow buildings, all mixed together. The town appears twice as big as it is, and it looks both imposing and beautiful. Right out of the center, on the edge of the sea, rises the sultan's palace, and farther down to the south are the buildings of the British consulate, which look like a white marble castle.

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As to the Sultan of today his income is largely from the British government, and from his own private estates. The British hold the protectorate over his dominions on a perpetual lease, for which they pay

him \$5,000 a year; and the Germans have secured the fee simple title to the lands which formerly belonged to his father upon the payment of something like \$1,500,000 cash.

I am not sure as to just what the sultan is worth, for his purse is kept separate from the general revenue of the country; and the taxes are used by the British under the direction of the British consul general. I only know that he has enough to live in considerable state, and to keep up magnificent stables, comprising the finest of Arabian horses. He has probably a large number of female slaves in his palaces and I am told there are thousands of women who are kept in slavery by the Arab officials and merchants here.

An Arab City. The Arabs are still the lords of Zanzibar, although the British act as rulers. They own the greater part of the island; they have the clove plantations and they work the native Africans to the limit. They go about in turbans and gowns; and the city looks more like a part of Egypt or India than of Central Africa. The streets are narrow and winding. The buildings are high with barred windows. They have enormous doors, plated with high-grade nails, making every house look like a

prison. Some of the streets have the walls so close together that carriages cannot enter them, and all are so narrow that the cabs have bells like dinner gongs, which they keep ringing as they drive through the streets, to warn the people to get out of the way.

The whole place is a combination of equal and splendor. Some of the shabbiest houses have doors of teak wood so beautiful that they would ornament any Fifth avenue palace, and these doors open into the meanest of shops and warehouses. The architecture throughout is Mohammedan, and the best-dressed people in the streets are those who wear turbans and gowns. Many of the Arab merchants dye their beards a brick-dust red, and I see scores of women who go about completely covered by yellow gowns which fall without a break from their heads to their feet. Their faces are entirely covered, and each girl looks out through a network of white cords woven over a hole not larger than a visiting card, and so closely that one cannot see the eyes behind.

Ten Thousand Hindoos. About one-fifth of the inhabitants of Zanzibar come from East India. There are more than 10,000 Hindoos and also Klings, Parsees and Brahmans. These people are

from all parts of Hindoostan, and they wear many strange costumes. I see little black girls whose arms and legs are loaded with gold and silver jewelry. They have tight pantaloons which fall to their ankles and are fringed there with lace. They have also a coat which covers to the knees. There are dark-faced women with nose buttons of gold and silver, and fat, greasy-looking Indian men, who strut about wearing pill-box caps made of velvet and cloth of silver. These men have on long coats buttoned up to the throat, and under their calico pantaloons which fit tight to the skin. Others have round-about jackets with gold studs down the front, which look for all the world like dress-shirts with the tails cut off.

These Hindoos do most of the retail business of Zanzibar. They have long streets of bazaar-like stores in the city heart, and their peddlers go all over the island. They use rupees as money, and their chief customers are the Swahilis and the other natives.

The British government handles the colony as though it were a part of India. The laws are those used in the courts of Hindoostan, and the government itself is modeled upon that of East India.

beams are enveloped in a two-inch coating of sand and cement. The Singer tower steel beams are protected in practically the same way. With the danger of rusting and deterioration from fire removal, engineers can see no reason why the Metropolitan should not last for ages.

The massive corner columns of this business structure are two feet square and weigh over one ton to the linear foot.

When the tower shall have been completed there will be more than 2,575 1/2 tons of steel in it, enough to build seven or eight twelve-story skyscrapers with the same ground area as the tower. The estimated cost of this marble tower is placed at about \$3,000,000, the ground representing an investment of about \$100,000.

The new City Investing building, next to the Singer building, is another of the city's most modern skyscrapers, the third highest. It possesses no tower but has ornate gables running up over the main structure to a height of 480 feet above the curb. Some idea of the height of this building may be obtained from the picture, showing its roof almost as high as the tower.

The City Investing building is 45 stories three stories high and is said to be the largest single office building in the world, providing twelve acres of rentable space. If this building were slumped down on the prairie there would be a city of 10,000 inhabitants.

There is 18,500 tons of steel in this building, which would make a rod one inch in diameter 2,000 miles long. In putting up the building 4,000,000 holes were punched in metal, and the weight of the metal punched out and thrown away was alone 125 tons, or \$20,000 pounds.

The blue prints required for the plans of the building if laid out on a flat surface would cover two acres. The bricks used in the building, if laid end to end, would stretch 1,311 miles, or further than from New York to Chicago. The plaster in the building if spread out would cover an area bounded by Fifty-ninth street on the south, Central Park West on the east, Seventy-eighth street on the north, and Columbus avenue on the west. Or the might plaster Broadway with it from the Battery to One Hundred and Twenty-fifth street.

There are 100 miles of electric wire in the building, twenty-two miles of conduit, eighty tons of copper, seventeen miles of piping. The three pumps which supply the water for the building have a combined capacity of 1,250,000 gallons a day, which is enough to supply a city of 60,000 inhabitants.

There are 22,000 tons of the fireproofing in the building. This would make 1,600 truckloads, reaching from Liberty street to Haverstraw, N. Y., twenty-nine miles. If loaded on barges it would take 110 barges, or a continuous tow 120 miles long.

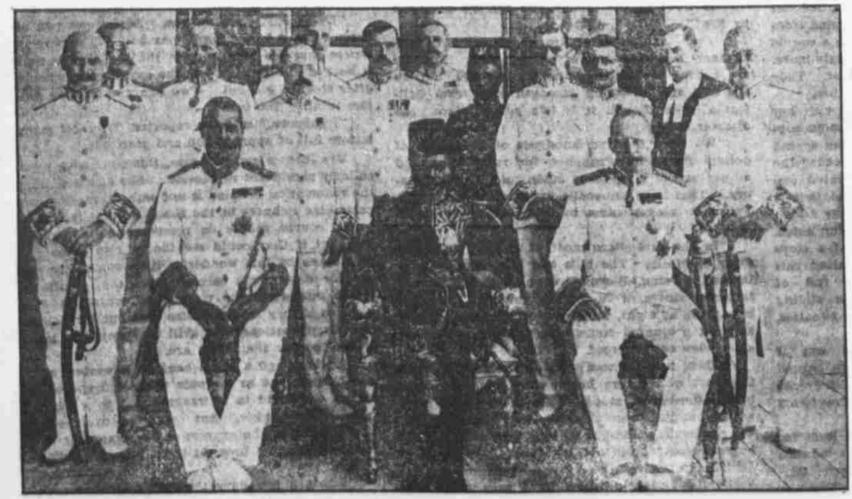
It took 22,000 yards of clay in manufacture this material. Each block was handled about twenty-six times from the quarry bank to the building. This is equivalent to one man handling one block 220,000 times. The marble in the building would cover Broadway from curb to curb with the Hotel Astor to Twenty-third street. It would take one man 42 years of continuous work to prepare the marble alone.

There are 2,750,550 cubes of mosaic in the building. The 8,700,000 pounds of marble in the building would make a column one foot square ninety-eight times as high as Washington monument.

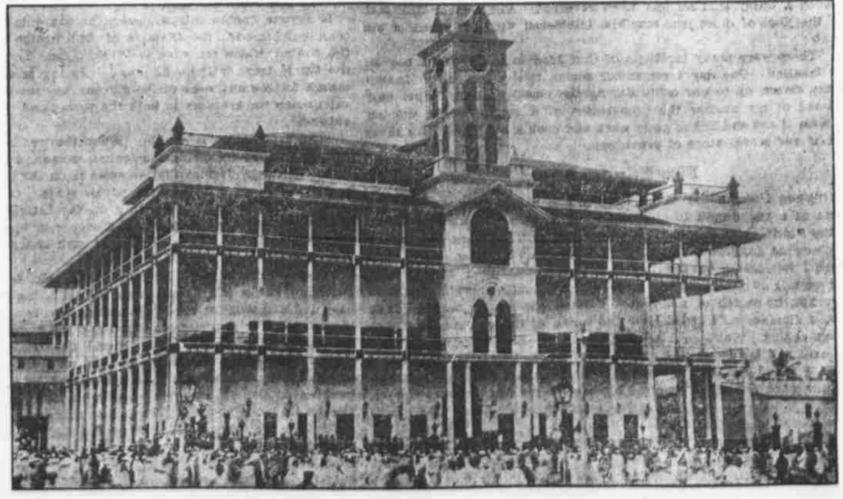
Next to the City Investing building for height come the Park Row building, which runs up 320 feet, and then the Times building which is 362 feet high.

The old sketch of New York in 1679 presents a study in contrast. It shows Manhattan from what is now Fulton street to the Battery. The original drafter was in the possession of the Long Island Historical society.

The cross marks the present site of the forty-seven story Singer building at Broadway and Liberty street. The wagon in the left is going down the original Maiden lane. The house in the foreground, which belonged to John Haberding, were sold in 1722 for \$60. The rural area of 1679 are practically covered now with buildings ranging from sixteen to forty-seven stories, many of which count their acres of floor space on plots that John Haberding wouldn't have thought big enough for his house.



YOUNG SULTAN OF ZANZIBAR AND HIS ENGLISH ADVISERS.



ON THE EDGE OF THE SEA RISES THE SULTAN'S PALACE.