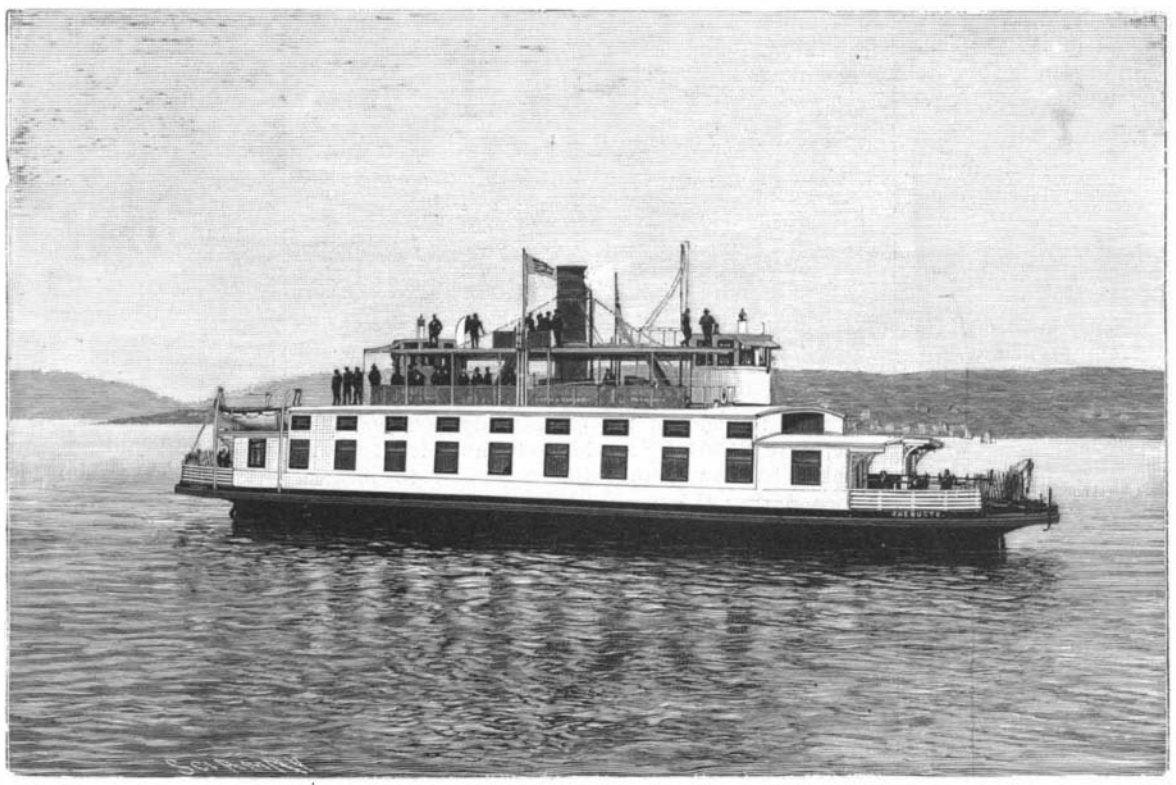
that she ran her official speed trial on the Firth of Clyde. On the invitation of Bailie John Shearer (senior partner of the firm that built the vessel) about fifty gentlemen accompanied the ferry steamer on her trial trip. She did two runs on the measured mile at Skelmorlie with both screws working, and with the engines going 170 revolutions per minute and indicating 400 horse power, she gave a mean speed of close upon 10 knots, which is equal to 11½ miles an hour, which, for a vessel of her class, is a thoroughly worthy performance.

After the trial, the Chebucto proceeded up the river to Glasgow the same evening, where she took on board 200 tons of bunker coal and was made ready for the passage across the Atlantic, her fore and after ends being boarded in and all her windows covered over with planking.



A SCOTTISH BUILT FERRY BOAT FOR NOVA SCOTIA.

A GREAT PELICAN ROOKERY.

BY C. F. HOLDER.

It has always been somewhat of a mystery where the numerous brown pelicans, so common on the Southern Californian coast, make their headquarters. During the summer months these lumbering birds, which bear so grotesque a resemblance to some of the old pictures of the dodo, come into the little bays alongshore and engage in a vigorous warfare upon the small fry—anchovies, herring, smelt and young mackerel—which are found there in such vast quantities.

The pelicans are very tame and pursue their avocation within a few yards of vessels lying in the bays. Their method of obtaining food is arduous in the extreme, and it is only by continual vigilance that they make a living. In hunting for food they fly heavily, twenty or thirty feet above the water, the long and singular bill, from which depends a capacious pouch, pointing downward, the small brown eyes on the watch for the expectant school of fish. Should it appear, the bird apparently throws itself over, then plunges downward, head first, with mandibles apart. The height of the dive carries the bird in many instances completely out of sight beneath the water, from which it rises in a few seconds, and if it has been so fortunate as to engulf a sardine or several in its capacious mouth, it tosses them up, seemingly from the pouch, by throwing the bill aloft, then swallows the morsels with self-congratulatory wagging of the diminutive tail, suggestive of its satisfaction.

The capture of game is not always a guarantee of a feast. The laughing gull, common in these waters, preys upon the pelican or robs it systematically whenever it can. This it accomplishes by alighting on the pelican's head or back as it rises, and as the clumsy bird attempts to arrange the morsel in its mouth preparatory to swallowing, the gull reaches forward and snatches it from between the long mandibles and flies away with exultant cries.

It has been supposed by many that the brown pelicans make their headquarters in Lower California, coming north in the spring; but during the past season the writer, during a cruise among the islands off Santa Barbara County, found the rookery of these birds. The islands which constitute the group are divided into two series—the Santa Catalina, off Los Angeles County, lying, according to the chart, in what is called the Santa Catalina Channel. These islands include San Clemente, Santa Catalina, San Nicolas and Santa Barbara. Seventy-five miles to the north lies the second division, comprising Santa Cruz, Santa Rosa, San Miguel and Anacapa. The latter is a long, slender, rocky island, rising from the water's edge to a mesa between one and two hundred feet in height at the east end. The highest portion recalled the famous enchanted mesa, as it was evidently inaccessible except by using ropes and a kite.

The island is divided into three distinct portions by the sea. The extreme end is flat, terminating in a pinnacle of rock, while through the center is a lofty arch, high and broad enough to admit the passage of a large yacht, through which the sea runs. The mesa was covered with birds, and as we ran near and fired the yacht's cannon there arose a cloud so vast that it fairly colored the air. Every bird had a long bill, and it suddenly dawned upon us that here was the home of the brown pelican on the Southern California coast. The great ledge of rock, flat on top, was colored white by the guano of the birds, and was distinguishable five or six miles distant. As we approached, the side of the cliff, which formed a slight angle, was seen to be covered with pelicans. They scrambled up the rocks from the lower portions, waddling with bills partly open and wings expanded. As the sound of the gun reached them the very ground seemed to rise, the birds whirling slowly upward in great circles, then slowly settling again.

The rookery, isolated and inaccessible, occupied probably four or five acres, where the birds seemed to be packed in; and that it was an ancient one there was every reason to believe. Here, in all probability, the young are reared in May. At the time of our visit, the middle of August, the rookery appeared to be occupied by old birds and two-thirds grown young.

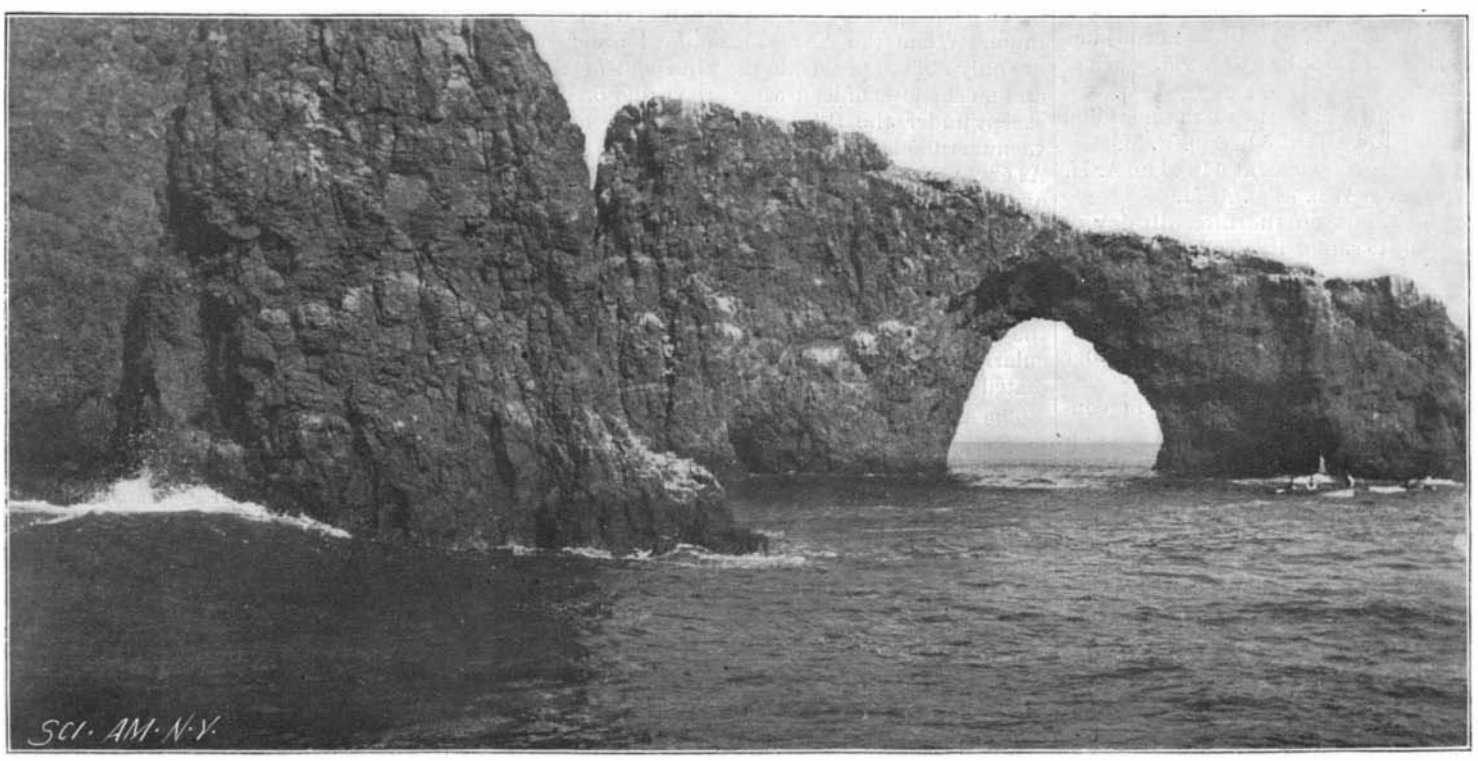
The pelicans here nest on the ground, there being no trees of any kind on this wind-swept island. This is in direct contrast to the brown pelican of the Florida keys, at least in instances observed by the writer, where the nests were in mangrove trees which were growing almost in the water. The nests were of the crudest description, the eggs retaining their position by virtue of good luck.

Not ten miles from the pelican rookery of Anacapa was seen a series of remarkable caves, in the entrance of one of which was a shag rookery. This was discovered by the aid of the odor some distance off. Upon approaching, a remarkable overhanging cliff was seen, the summit of which was possibly 500 feet above the water—a stupendous pile of rock. Near the base it had been eaten away by the sea, leaving a series of rough shelves or ledges which were occupied by shags, old and young.

Leading directly into the cliff was a large cave, whose side entrance was also pre-empted by shags, who were, in the main, two-thirds grown.

After some difficulty, the writer landed and climbed into this rookery. The nests were of kelp and other sea weed roughly thrown together, and strewn about on the rocks were numbers of young birds, some nearly devoured and others partly torn in pieces, showing that some animal preyed upon them. After a careful examination of the surroundings, the writer was forced to think that, half starved, the birds had preyed upon each other and that it was a case of a literal survival of the fittest. On the water in the cave floated numbers of dead young shags which had evidently fallen in, and unable to swim, had been drowned. Yet the young handled were strong and powerful and used their sharp beaks to good advantage.

In the same cave an attractive swallow with white markings was nesting, its nest being fastened to the walls. They were made almost entirely of the feathers of sea birds, covered on the outside with a light clay veneer which made them very heavy and also almost indistinguishable from the rock, this probably being the object of the birds—an interesting instance of protective



A GREAT PELICAN ROOKERY.

resemblance. The pelicans undoubtedly use the Anacapa rookery as a nesting place, spreading from here up and down the coast to visit the various feeding grounds.

The great arch at Anacapa is of itself a notable object and well worthy a visit, being of large size and presenting a grand and picturesque appearance from either side. It well illustrates the method of disintegration which is going on in these islands, which are all honeycombed in a most remarkable manner, presenting a series of marine caves which for size and interest have no counterpart in this country.

The east point of Anacapa, or the pelican rookery, originally had four arches where there is now one. These gradually were won away until the top fell in, divorcing the section from the island, but preserving the mesa line or angle exact.

THE ASTORIA HOTEL, NEW YORK CITY.

With the completion of the new Astoria hotel, which adjoins and will be incorporated with the famous Waldorf hotel, this city can boast of possessing the largest and most sumptuous structure of its kind in either hemisphere. The Waldorf-Astoria, as the combined establishments will be called, covers a block of ground bounded by Thirty-third and Thirty-fourth Streets and Fifth Avenue, the present entrance of the Waldorf being on the former street, and the future main entrance of the combined hotel being in the center of the grand façade on Thirty-fourth Street.

In its architectural features and general scheme of decoration the Astoria follows the lines of the Waldorf; but in its magnitude and in the engineering problems involved in its construction it far surpasses the older structure. The external treatment follows the school of the German Renaissance, which style also characterizes much of the interior, though most of the larger and more elaborate rooms are designed in the style of the Italian and French Renaissance.

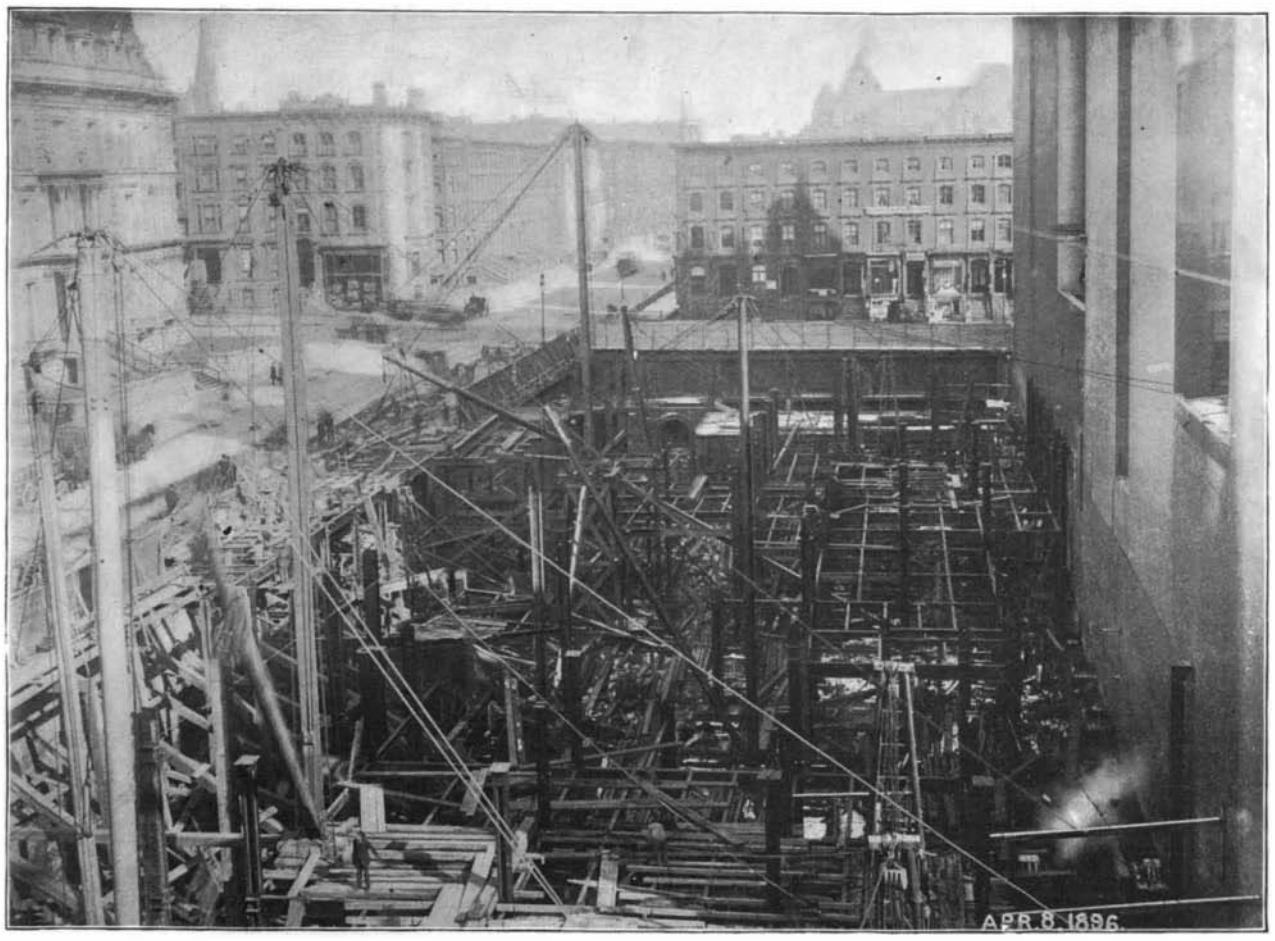
The exterior view of the combined building, with its vast frontage of red sandstone extending for 200 feet on Fifth Avenue and 335 feet on Thirty-fourth Street, would be imposing for the frontage alone; but when the eye follows through its sixteen stories to the roof line 250 feet above the curb the effect is truly majestic. No such façade was ever planned, certainly none such was ever built, either in ancient, medieval, or modern times.

The foundations were in every case carried down to solid rock, the surface of which was found at depths varying from 3 feet to 65 feet below the street level. As none of the foundations were less than 35 feet below the street level, a vast amount of rock excavation was necessary, and where the rock was found below the 35 foot line, the surface was leveled and concrete piers were carried up. Upon the rock or the concrete piers brick piers were built up and capped with granite, and upon these were placed the footings for the columns. It is not necessary to enter into the general structural features of the buildings, as they are of the standard type common to tall buildings of composite steel and masonry construction. There are some novel engineering features, however, which were necessitated by the great size and unobstructed view demanded for certain of the rooms, that call for special mention. The problem was to provide such rooms on the lower floors of the building and yet make provision for carrying the walls of the dozen or fourteen stories above them. The plan adopted was to erect massive steel trusses above the ceiling and incorporate them in the walls which they carried. There are two notable cases in which this has been done. The first occurs above the dining room, which is located on the ground floor on the Fifth Avenue front, and connects with the dining room of the Waldorf. The two rooms will be practically thrown into one, making a vast hall 50 feet wide by 200 feet long. There is a row of columns down each side of the room, the columns standing 6 feet out from the walls. The remaining 38 feet of width is entirely unobstructed by columns, and to carry the great weight of the transverse walls above the ceiling three heavy steel trusses were thrown across from wall to wall. Each truss is 26 feet 8 inches deep and 51 feet 7 inches long, and it is built into the wall which it carries.

Another and even more remarkable structural feat was carried out above the great ballroom, which is situated at the western end of the building. The room measures 85 feet by 96 feet and extends in height through three stories. The two great trusses, of which we give illustrations, had to be made heavy enough to carry the concentrated load of the walls overhead, and as these walls extended through twelve stories, the loads to be provided for were unusually heavy. Each truss measures 84 feet 9 inches between the end piers of the bottom chord and is 51 feet 3 inches deep, the top chord being at the level of, and built into, the fourth floor above the ballroom ceiling. The lower chord consists of four rows of massive eyebars $2\frac{1}{16}$ inches thick by 12 inches deep, with 10 inch pins, the pins at the end posts being 12 inches diameter. The lower half of the end posts is extremely heavy, being made up of $10\frac{3}{4}$ by $29\frac{1}{2}$ inch webplates, two $\frac{1}{2}$ inch by 36 inch cover plates and 12 angles $\frac{1}{2}$ inch by 4 inches by 6 inches. The two trusses are placed 14 feet 9 inches apart and they are connected by diagonal sway bracing. When it is borne in mind that the whole of this trusswork had to be so placed that it would lie within the plane of the walls, and its various members so disposed that they would not interfere with the various corridors and halls of the upper rooms, the work reflects great credit upon the architect, Mr. H. J. Hardenberg, and the engineers, Messrs. Purdy and Henderson.

Before leaving the structural features we draw attention to the photograph showing the massive girder, 7 feet deep, which carries the western end of the big trusses above mentioned. The line of the columns changes at the fourth floor, those above this level not coinciding with the columns beneath. In order to transfer the column loads a line of massive girders was introduced which varies in depth from $4\frac{1}{2}$ feet to 7 feet. The ends of the two big trusses rest upon this girder, which receives one-half of their load. The massive column seen below the girder takes the greater part of this transferred load and is the heaviest in the whole building. The lower section of it carries a load of 5,400,000 pounds, and its weight for 30 feet of its length is 46,980 pounds. There are over 1,600 tons of plate girders in the building, and the total amount of steel work is over 10,000 tons. We are informed that this represents only one-tenth of the cost of the building,—a remarkably low figure when we bear in mind the unusual problems involved in the construction.

It has been the aim of the designers of the Astoria to



WORK IN SUB-BASEMENT OF THE ASTORIA HOTEL.

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"MUSIC"—BALLROOM CEILING BY E. H. BLASHFIELD.