NAVAL WAR ENGINES.

TERRIBLE MODERN WARSHIPS.

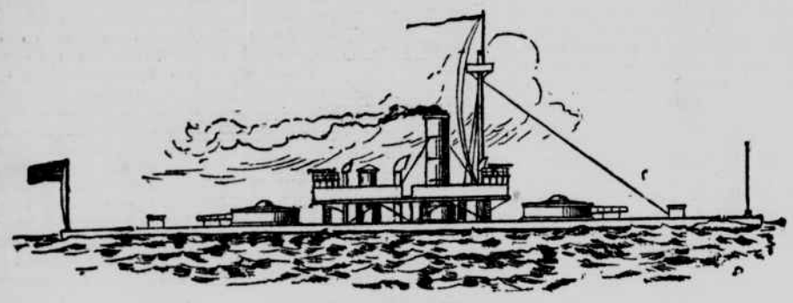
THE INVINCIBLE MIANTONOMOH.

HER MIGHTY GUNS AND POWERFUL ARMOR—HOW HER MACHINERY IS WORKED.

"For every cruiser that we build we should construct a double-turreted monitor of the Miantonomoh, Monadnock, or Puritan type, only they should be built strong enough to resist modern ordnance, for these are the protectors upon which we must rely in time of war," said the late Admiral David D. Porter, in his report to Secretary Whitney, in 1885, as requested by the latter, embodying suggestions for promoting the efficiency of the Navy. But it was decided to build no

MOUNTED GUN FOR THE MIANTONOMOH.

more of this type of battle-ship, a type which gave to the history of the Civil War that most interesting chapter of the battle of the Monitor and the Merrimac. The Miantonomoh will be the only war vessel to remain in New-York Harbor in commission until the return of the vessels of the North Atlantic Squadron and the Squadron of Evolution next spring, and some of these may not return then if in the meanwhile the disturbed condition of affairs of those Governments should continue and require additional vessels to be sent to Brazil and Chili to protect American interests there. Visitors at the Navy Yard may be seen staring at the Miantonomoh, their breasts heaving with emotion and pride that this Government possesses so formidable a protector—and an aggressor, if need be—as this double-turreted, low-freeboard monitor, in addition to the new cruisers and gunboats already built and in commission for sea-service, besides other cruisers, battleships, commerce destroyers, etc., in course of construction. But could these visitors be permitted to descend into the bowels of this reconstructed vessel and examine the machinery which is to work the turrets and load and

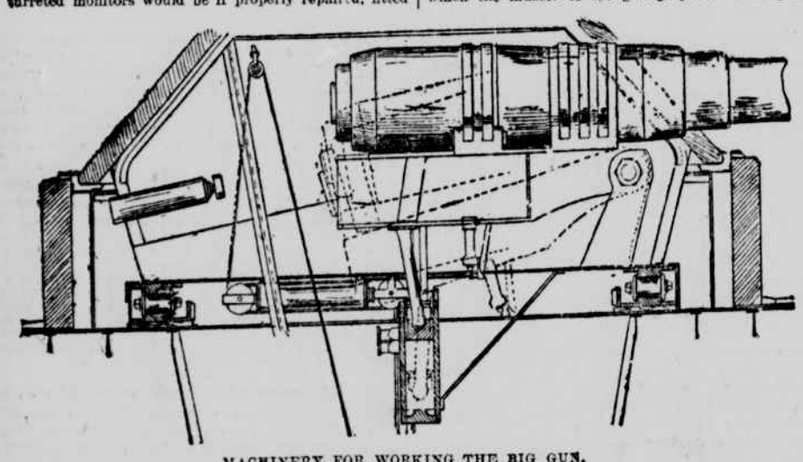


THE MIANTONOMOH.

manoeuvre the guns, they would be astounded at the complications of valves, cylinders, and other parts of the mass of hydraulic machinery. But this is a new system, a development of the combined brains of the officers of the Bureau of Ordnance, when Captain Montgomery Sicard was at its head, and who is now the commander of the vessel, and the description of its mechanism is here given for the first time to the public. There is little doubt, if any, that it will prove entirely and satisfactorily successful when it is tested for the first time, in about two weeks from now, in Gardiner's Bay, although some adjustments may be necessary afterward.

The Miantonomoh is the first really formidable ship of the new Navy. She is a battleship in one sense of the word, for there is no ship-of-war afloat in any water which she could not meet with a pretty sure chance of victory, although she is primarily a harbor-defence ship. She is one of five now being completed and it was a great satisfaction to officers of the Navy when money was appropriated by Congress for finishing them, thus giving some security against the invasion of our harbor by any sixth-rate naval power which might happen to possess a couple of British-built ironclads. Admiral Porter said regarding this:

"We will not be entirely free from the danger of such an invasion until the double-turreted monitors are finished and have their guns mounted, and it can be readily judged how formidable an addition the single-turreted monitors would be if properly repaired, fitted



MACHINERY FOR WORKING THE BIG GUN.

and armed for the defence of our coast. . . . No nation can dispense with forts, but it is better to depend upon a navy to protect our coasts, instead of maintaining so small a force of ironclads as we have at present. Every year we should construct three or four double-turreted monitors, no matter if we do not build any cruisers in the meantime." But it was decided during Secretary Whitney's administration that no more such vessels should be built. The battle-ship Maine, in course of construction, is moored near the ship-house from which she was launched a year ago, while the Miantonomoh lies just opposite, across the channel, so that they are in view of each other. The latter will carry as heavy guns as the former, but the Maine is so high above water that she presents a huge target and the chances of her destruction and the killing of her crew in battle would be much greater than with the Miantonomoh, upon which almost every body would be below the deck, and those in the turrets would be protected by the extra thickness of armor and the deflective shape of the turrets themselves. The work on the hydraulic machinery in the turrets will be completed by the middle of December, and then the vessel will be taken to Gardiner's Bay for target practice, after which she will be ready for active service.

The vessel was built by John Roach & Sons, at their works on the Delaware, and, in many respects, is a reproduction of the old Miantonomoh, being of the same type and arrangements and nearly the same dimensions. There is an important difference, however, in this, that the hull of the new ship is of iron, with double bottom; it has, therefore, far greater strength and will not rapidly decay, as did the original wooden vessel.

The original Miantonomoh was built in 1864, and while this class of vessels was never designed for cruising purposes, but for harbor defence and operations upon the coast, owing to the foundering of the Monitor off Cape Hatteras, and another one on the blockade off Charleston, the impression prevailed that they could not be sent with safety outside the harbor in which they were constructed. To dispel this false impression the Secretary of the Navy decided to send the Miantonomoh across the Atlantic to Europe and return, and the Monadnock by way of the Straits of Magellan to San Francisco. The latter sailed on November 2, 1865, and reached Mare Island on June 22 following. The Miantonomoh sailed from New-York on May 6, 1866, and, after visiting Halifax, she crossed the Atlantic to Queenstown in ten days. Her cruise included calls at Portsmouth, Cherbourg, Kiel, in fact most of the principal naval ports in Europe, including Cronstadt, and she returned home without a mishap, thus removing all doubt as to the seaworthiness of her class.

The present Miantonomoh resembles very closely the original. Her principal dimensions are: Length on the load water-line, 259 1-2 feet; extreme breadth amidships (she is wedge-shaped at bow and stern, her contour of hull resembling that of a pumpkin seed), 55 feet 10 inches; mean draught of water, 14 1-2 feet; displacement, 3,990 tons. She is fitted with twin-screw inclined compound engine, capable of giving her an average speed, under normal conditions, of 10 1-2 knots. Her main battery consists of four (two in each turret) 10-inch breech-loading rifles; and her secondary battery of two 6-pounder and two 3-pounder rapid-firing guns, two 37-millimetre Hotchkiss revolving cannon, and two Gatlings. Each of the 10-inch rifles weighs 27 1-2 tons and is 31 4-10 feet in length. The effective fighting range is seven miles, but the maximum distance which these big guns will throw their projectiles, with fair accuracy, is thirteen miles. The weight of the powder charge is 240 pounds, the weight of projectile 500 pounds, and with this it is estimated that it is capable of piercing 20.1 inches of steel at the muzzle. The armor belt, which has a total depth of 6 feet 5 inches, or 47 inches below the water-line, is of steel plates 7 inches thick. The two turrets are of the roller base type, carrying armor plate 11 1-2 inches thick. There is a conning tower on the top of each, which is made of steel plates 9 inches thick. With the exception of the Miantonomoh all of the vessels of her class are provided with armor plates manufactured in this country. No proposals were received from manufacturers in this country in answer to the advertisement of August 20, 1883, for compound armor plates for the turrets and conning towers of the Miantonomoh, and the contract was awarded to John Brown & Co. and Charles Cammell & Co., of Sheffield, England.

A circular letter was issued by the Navy Department June 20, 1884, to the leading steel manufacturers requesting them to inform the Department whether they could be prepared to manufacture armor, either all steel or compound, for the monitors. The replies indicated the absence in this country of a suitable plant for the production of the required armor, and only three of the manufacturers showed any ability or disposition to undertake the manufacture. The condition in this country to-day is just the opposite. With the Carnegie, the Bethlehem, the Midvale and other steel works, all of the steel needed for armor, for guns and for other parts of war vessels can now be furnished by American manufacturers, and they can supply steel for other countries, too; and the recent tests of armor plating proves that the American product is superior to anything ever made in any other country of the world.

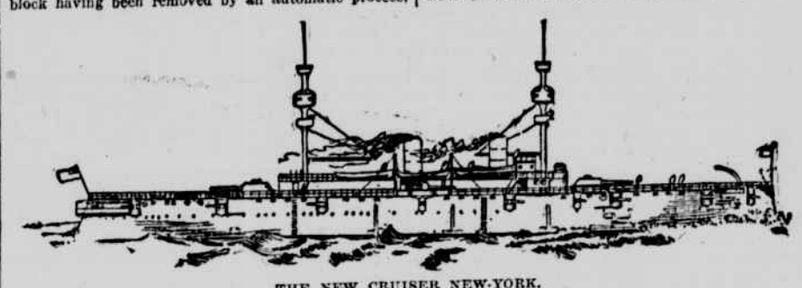
But the labyrinth of machinery inside of the turret is an object lesson for naval engineers, naval architects, ordnance experts, and everybody else interested in the improved methods of disposing of an enemy, and disposing of him with the utmost expedition. The turrets rest upon cones or trucks, which revolve upon tracks fitted to the turret deck in a circle, these being turned by a gear wheel which runs in slots moulded into the turret near the base. The guns are trained upon the object of attack by the turning of the turret, but are elevated or depressed, as desired, by the hydraulic machinery in the turret. Each turret is divided by a bulkhead, so that each gun and its machinery are distinct and separate from the other, and the only opening into the turret from the outside is the porthole through which the muzzle of the gun projects. This port is little larger than the outer diameter of the gun, so that the chance of splinters from a shell getting inside the turret is very slight. If, however, the muzzle of one gun should be so shattered by an enemy's shot as to disable the gun and leave an opening into the turret, the other gun's crew being separated by a shot-proof bulkhead would not be exposed to danger. The hydraulic power which revolves the turret, elevates and depresses the guns, hoists the ammunition, checks the recoil, returns the gun to its firing position and operates the loading mechanism, is obtained from separate engines or pumps, which compress the water to the desired pressure—in this case 600 pounds to the square inch—and then transmits it to the various pipes from which it performs the various operations, and is then returned through the general exhaust pipes to the supply tanks below. The machinery is so complicated and of so many parts that it is difficult to describe its workings in a comprehensive and intelligent manner so as to be understood by the general reader.

Riveted to the turret floor are strong brackets or legs for supporting the gun carriage, which, by the arrangement of a horizontal pivot at the outer end, is utilized for elevating and depressing the gun through the aid of the hydraulic ram working underneath it. When it is desired to depress the muzzle of the gun the pump forces the water under the plunger of the hydraulic piston or ram, the upper end of which works into a socket underneath the carriage, thus raising the breech. When the desired depression or elevation is attained the connections are closed and the gun held in position by the pressure of the plunger under the carriage. To elevate the gun, or lower the breech, the water is exhausted from under the plunger and it descends. On top of the underframe is a saddle or top carriage, which holds the gun, the saddle sliding on the top of the rails. Instead of trunnions, as on ordinarily mounted guns, the turret guns are furnished with trunnion bands which fit in corresponding grooves in the saddle, and are secured in place by longitudinal pins running through the bands and shoulders of the grooves. This locks the gun in the saddle.

The recoil of the gun is about four feet, and it is restrained by hydraulic pressure in a cylinder placed under the gun, in a parallel line with it, the piston rod of which is attached to the gun by an elongation or arm suspended from the under side and connected to the saddle. Back of and connected with the cylinder is a box or receiver for the exhaust water. Between this box and the back end of the cylinder is a diaphragm the holes in which are conical for the fitting of small valves, around the stems of which are spiral springs to govern the action of the valves. The moment the gun is fired the concussion tends to force it to the rear. The recoil is governed by the escape of the water from the back of the piston and through the valve openings, so that it may be slowly done. When the gun has recoiled the weight of the breech carries it down to the loading floor, a descent or drop of 2 2-3 feet, where it is made ready for the next fire. The breech of the gun is fired the concussion tends to force it to the rear, above mentioned, which is secured to the turret floor, and works in the socket underneath the underframe or lower carriage. When in its training position the gun is then run out by the admission of hydraulic pressure back of the piston in the cylinder between the rails under the gun. But the piston is not packed, as are pistons of steam-cylinders to prevent the steam from pressing on both sides of the piston, hence the water is on either side of the hydraulic piston and the gun is returned to its firing position, or run out, by the excess of pressure due to the difference on the two sides of the piston, the difference being the area of the cross-section of the piston rod. This is a brief description of the manner of handling the gun.

In addition to the hydraulic machinery above described there is another series of pipes, cylinders, etc., which is equally as intricate and as necessary for the perfect working of the whole. It is the machinery used for carrying the ammunition from the magazines to the gun and then placing it into the gun. For this there are lifts, carriers, pumps, wire-rope falls, etc. The powder and shell magazines are between the berth-deck and the floor of the inner bottom, and on either side of the central line—for these monitors have no keels—of the vessel. All of the handling of ammunition from the magazine to the gun is done by the hydraulic machinery. As the ammunition-hoist is arranged to revolve with the turntable, loading can be performed in any position of the turret, but the gun must first be run in and the breech depressed for all of this work is done below the level of the deck, where the men are protected from every possible danger from the shot of the enemy. The gun recoils to the loading position as heretofore described.

Through the centre of the turret, from the bottom floor to the conning tower, there runs a spindle. The lower part is utilized for the receiving and exhaust water of the pumps and cylinders. On the top there is a signalbox to verify to the officers in the conning-tower the communications sent by or coming to him. Through the spindle run the voice tubes and wires communicating to those below decks at what speed to run the engines, in what direction to steer, the direction to turn the turrets, whether to elevate or depress the guns, etc. This officer is the only person in the conning tower, and his only direct communication to the outside world is by his eyes through the peep-holes in the conning-tower. On the bottom floor are two ammunition cars, each with two shelves, the lower for the shell and the upper one for the cartridge—which run around on circular tracks from the door of the magazine to the cage or lift, which carries the ammunition to the breech of the gun. These lifts or ammunition-carriers are carried up by a hydraulic engine acting upon a wire-rope fall, and when the projectile is in line of the bore of the gun, the breech block having been removed by an automatic process,



THE NEW CRUISER NEW-YORK.

the hydraulic rammer in the rear and in line with the bore forces the shell into place. Then the rammer returns, the cartridge-shelf is swung over by hand when it is brought in line with the bore of the gun by an automatic arrangement, and the cartridge is carried into place by the rammer. The lift then returns to the bottom floor for another charge of ammunition, and in the meanwhile another shelf carrying the breech-block is moved in line of the bore of the gun and forced into place by the rammer, after which the breech-lock is thrown over into place. Then the gun is ready to be swung into its line of fire and run out by the hydraulic engines.

There are many improvements in this mechanism over any other employed by foreign Governments for the handling of guns, and if it is as successful as it is expected to prove it will be an invaluable machine possessed only by the United States Navy. Still there are many authorities who believe that the question of rapidity of fire, in view of the very possible general introduction of smokeless powder, has become of such importance as to render advisable the substitution of electric for hydraulic power, and some of the electric experts among the officers of the Navy are making experiments in this line.

Ever since the Miantonomoh was built there has been confusion about the spelling of the name. It is authoritatively asserted that she was christened the "Miantonomiah," and in Captain George H. Preble's "History of Steam Navigation" he spells the name in that way; and this was a very common way of spelling the name at one time. Admiral Porter invariably spoke of her in his reports as the "Miantonomah," and the reports of the Secretary of the Navy up to a couple of years ago spelled her name "Miantonomah" and "Miantonomoh." The latter now has the preference, and on her bell, placed on her since she was reconstructed, the name is spelled "Miantonomoh." It is evident that this was the name intended for her, since she was named after Miantonomoh, a sachem of the Narragansett tribe of Indians, who succeeded his uncle, Canonicus (the name of another of the monitors) in 1636.

THE BIG CRUISER NEW-YORK.

HER OFFENSIVE AND DEFENSIVE POWERS.

TO BE LAUNCHED ON WEDNESDAY—A COMMERCE DESTROYER AND PROTECTOR—MISS HELEN C. PAGE OF THIS CITY, TO CHRISTEN THE SHIP.

Philadelphia, Nov. 22.—Within the next week there will be launched at the shipbuilding works of William Cramp & Sons by far the most important war vessel in the group authorized by Congress in 1887, and in many respects one of the most notable ships of the Navy. She will be launched at 2 p. m. on Wednesday. She is the armored cruiser No. 2, or, as she will be christened, the New-York, by Miss Helen C. Page, daughter of J. Seaver Page, secretary of the Union League Club of New-York, and by which name she has been known for more than a year. The preparations for launching this vessel have been in progress for several weeks; the launching ways are being put in readiness; the hull has received the regulation coats of paint, and to see her as she lies on the ways, her sharp, graceful lines would suggest that she is to be added to the fleet of the speedy transatlantic steamships. It is possible, although not hoped for, that she may some day be employed to reduce, either by shells from a breech-loading rifle or torpedoes from the port made for the firing of these death-dealing weapons, the speed of the fleet transatlantic liners. Her great ram bow is painfully suggestive of the terrible result if it should ever be sent against the side, the bow or stern of an enemy, or by accident, hit a friendly vessel.

Three firms bid for the construction of this vessel, as follows:

Class 1. Hull and machinery, including engines, boilers and appurtenances, complete in all respects in accordance with the plans and specifications provided by the Navy Department—William Cramp & Sons, of Philadelphia, $3,150,000; Union Iron Works, of San Francisco, $3,100,000; Risdon Iron asd Locomotive Works, San Francisco, $3,450,000.

Class 2. Hull and machinery, including engines, boilers and appurtenances, complete in all respects in accordance with the plans and specifications provided by the bidder, guaranteeing strength of materials, displacement, speed, etc.—Union Iron Works, of San Francisco, $3,000,000; William Cramp & Sons, of Philadelphia, $2,985,000.

The proposal of William Cramp & Sons to build the vessel, under the second classification, for $2,985,000, being the lowest received, was accepted, and a contract was entered into on August 28, 1890, for the construction of the ship according to the Navy Department's plans and specifications for the hull and machinery, as modified by the bidders. The modifications included a rearrangement of the boilers, so that additional longitudinal and transverse bulkheads could be fitted in the engine and boiler spaces, thereby affording greater protection to the machinery and making the boilers less vulnerable to attack from rams and torpedoes. The keel was laid on September 30, 1890, and the contract requires that the vessel shall be finished and ready for delivery to the United States on or before January 1, 1893.

The object which the Navy Department has strived for in the armored cruiser New-York, and which, it is confidently believed, has been attained, is an unusual combination of great offensive and defensive power, with extraordinary coal endurance, and a high rate of speed. The ability to cruise for a long period under steam when coaling stations are not near at hand has been largely developed in the cruiser New-York. In this respect she will be far superior to the armored cruiser Maine, which is rapidly approaching completion at the New-York Navy Yard. The Maine, it is admitted, will be a powerful fighting ship; so also will be the New-York. But while the Maine will have a cruising radius of 4,250 knots at a 10-knot speed, the New-York will have a cruising radius of 13,000 miles. The ability of the new cruiser to maintain herself when at a great distance from a home station has been secured chiefly by her great size. When she is baptized in her element, three months hence, she will be the largest vessel of the United States afloat. Her principal dimensions are: Length on load-water-line, 380 feet 6 1-2 inches; breadth of beam, 64 feet; mean draught, 23 feet 3 1-2 inches; displacement, 8,150 tons; maximum speed, 20 knots; estimated average speed under full power, with natural draft, 18 1-2 knots.

The maximum speed given for this ship, namely, twenty knots, it is declared by the Navy Department, as well as by the contractors, will be sufficient to enable her to escape from any of the more powerful ships afloat to-day and to overtake the vast majority—certainly 98 per cent—of all the ships of the world, naval or mercantile. At the same time, her draught and size are not excessive. "All armored vessels, as has been repeatedly said, and perhaps cannot be said too often," said Secretary Tracy recently, "are a compromise between the conflicting elements of battery, armor, endurance and speed upon a given size or displacement." Increase one of these elements, the size remaining the same, and some of the others must be decreased. The New-York's speed and endurance certainly promise to be all that should be asked from a cruiser—a maximum speed of twenty knots, and a coal-endurance at a ten-knot speed of 13,000 miles. The New-York was designed and has been constructed with the view of the possibility of her engaging with the most powerful vessels of her type abroad.

The main battery of the New-York will be composed of six 8-inch and twelve 4-inch breech-loading rifles, and by comparing these guns with those of many of her type abroad, it will be observed that the guns of several of the foreign naval cruisers of about the same size as the New-York are of heavier calibre. It is doubtful, however, the high manoeuvring qualities of the New-York and her ability to choose the range of firing being considered, if in a fight with such a vessel as the Imperieuse (8,400 tons), the heavier guns of the latter would prove of any marked advantage. The New-York's battery would certainly give her chances which are not to be despised should she be driven to a momentary encounter with a battle-ship. Fighting battle-ships, however, is not to be her business; she was designed and built to keep the sea and to destroy an enemy's commerce; and not only his commerce, but to put out of the way any commerce-destroyer that the enemy might send out. She is thus to be both a commerce protector and a commerce destroyer of the highest efficiency. Secretary Tracy has said: "Four such ships, distributed in various quarters, would put an effectual stop to the depredations of as many fleets of ordinary cruisers."

For general purposes of service in war, the New-York is believed to have a wider field of usefulness than any other ship yet designed for the Navy. Besides the guns of the main battery mentioned, she will have a secondary battery of eight 6-pounder and four 1-pounder rapid-firing guns, and four Gatlings. Her armored deck is three inches thick in the flat, with six inches thickness of slope; her sides have a complete belt of cellulose, a water excluding material, and in the wake of the engine spaces there is an armor belt five inches in thickness, and also a protective deck, the plates of which are six inches thick. Four of the six heavy 8-inch guns are protected in barbette turrets with plates ten inches thick, and there is a further protection for the men working any of the guns in the shape of a steel shield, seven inches thick, which is fixed over the muzzle of the gun.

The New-York will be the first vessel of the Navy to bear that name since the white oak frigate New-York was torn to pieces at the Navy Yard a few years ago and sold for firewood. This vessel was begun in the Civil War, but the war ended before she was completed, and after remaining on the stocks for several years she was condemned and sold for what she would bring. In recognition of the honor paid by Secretary Tracy to the State of New-York a large and valuable library is to given to the ship by a retired business man of New-York City, who does not wish his name to be mentioned. When he called upon Captain Erben, commandant of the New-York Navy Yard, a few weeks ago in relation to the proposed gift, he was directed to consult with Secretary Tracy direct. When asked to give his name for publication, he said: "You can say that the contemplated gift will be the most valuable library ever placed on board a ship, and that its value will run up into the thousands."

HE COULD NOT MOVE HER TO PITY.

SHE MOVED HIM, HOWEVER, IN A LIVELY MANNER.

"Madam," said the tramp, as he put his foot inside the door, which the housewife had opened to his knock and had begun to shut again, as soon as she saw him, "I am not a beggar, I am an inventor. I have discovered a simple process by which the odor which onions spread through your comfortable and elegant home while they are being cooked can be entirely prevented."

"Yes, well?"

"I have spent a great deal of money, Madam, in experimenting toward this end, but now that I have found it, I am no greedy monopolist. I will part with this invaluable secret for a small consideration."

"Yes, well?"

"If I am not mistaken, Madam," he said, sniffing the air in an impartial manner, "You are cooking those over-fragrant but nourishing vegetables at the present moment.

"Yes, well?"

"Most people object to the odor. I presume you are with the majority on that point, madam?

"Yes, well?"

"I judge by your manner, madam, that you are unwilling to part with the ready cash for my invention?"

"Yes, well?"

"As I said before, I am no monopolist. I will tell you it, I will even tarry and instruct you in its use, for one dish of those onions, madam;" and he wiped his mouth with a dirty hand and tried to get his other foot inside the door, but the woman held it fast.

"I perceive that you do not want my invention at all, madam," he said in a deeply injured tone. "That you do not appreciate it. That my efforts to relieve humanity of the offensive odor of onions have been wasted entirely, as far as you are concerned?"

"Yes, well?"

"Madam, when I began to experiment for my deodorizer, I was a wealthy man, a respected citizen, an office-holder and the father of a happy family."

"Yes, well?"

"Sparing neither time nor money in the pursuit of the welfare of my race, I failed in business."

"Yes, well?"

"Worn out with the struggles to keep up a respectable appearance, my wife, the faithful partner of my joys and sorrows, was called to her reward," and he snuffled plaintively.

"Yes, well?"

"Then a blight seemed to fall on my little brood and one by one they drooped and died."

"Yes, well?"

"Next I was left an orphan."

"Yes, well?"

"And then my mother-in-—"

"Yes, well?"

"My—madam your cold and unfeeling manner chills in me all the instincts of a gentleman. I have seldom, in telling my sad story, got beyond my wife's death without the offer of substantial assistance; but you have let me run through my entire family and get mixed up with my mother-in-law, and still have given me only that one stereotyped reply."

"Yes, well?"

"Well, this—" and he threw his whole weight suddenly against the door. The woman was not expecting it and she gave way. In an instant the tramp was in the hall, looking fit for murder. But she did not quail.

"I'll tell you what I'll do," she said. "I am the champion woman jumper of the county—take all the prizes at the fairs and picnics—and I can jump further than most men. Now I'll bet you the best dinner my kitchen can afford, including onions, against your deodorizing invention, that I can jump further than you from off the doorstep."

"Done," said the tramp.

"You jump first," said the woman, "and jump as hard as you can, for I warrant you I can cover lots of ground."

The tramp doubled up his ragged knees, swung his long arms, and jumped, bursting off his only suspender button, and landing about eight feet outside the door. When he turned he saw a double-barrelled shot gun in the hands of the onion-cooker and as she covered him with it, without a quiver of her muscles, he departed swiftly without a word, taking his unuttered secret with him.

"UNTO HOW MANY."

By Robert Buchanan.

Unto how many men each hour
Frail little fingers seek to bring
Some gentle gift of love, some flower
That is the Soul's best offering?
Some happiness which we despise,
Some boon we toss aside for ever—
And only that our selfish eyes
May smile one moment on the giver
How many of us count or treasure,
The little lives that perish thus,
To garner us a moment's pleasure,
A moment's space to comfort us?
Blind, ever blind, we front the sun
And cannot see the angels near us,
Forget the tender duties done
To willing slaves to help and cheer us
Earth and its fulness, all the fair
Creations of this heaven and air,
All lives which die that we may live,
All gifts of service, we pass by,
All blessings Love hath power to give
We scorn, O God, or we deny!

RIVERSIDE DRIVE HOUSES.

ARTISTIC HOMES OVERLOOKING THE HUDSON.

A MAGNIFICENT THOROUGHFARE AND THE FINE RESIDENCES WHICH HAVE BEEN BUILT IN IT.

As far as its own beauty and its magnificence of the view it affords are concerned, Riverside Drive is easily first among the residence thorough-

THE FOUR LOWTHER HOUSES.

fares of this city. In the charm of its surroundings, it is all that could be asked. The grand driveway is a panorama of spirited horses, spick and span vehicles and well-dressed persons, every afternoon in the season; Riverside Park, along the roadway, is a delightful spot for the children, and, more than all else, the broad Hudson, the great Pallisades and the Jersey hills rising beyond form a vista which stirs the aesthetic instincts of all. That wealthy people will recognize all this, and will line the Drive with a series of handsome dwellings, is a matter of course. Even now a satisfactory beginning has been made of the building up of the Drive, and some of the most artistic residences of the city have been put up there or are in the course of erection.

Nearly all these houses have been begun within half a dozen years, and a house in the Drive which can look back on a history of ten years is a pioneer in the thoroughfare. There are still a few old-fashioned houses which were built when that part of Manhattan Island was in the country, and reminders of the reign of Shantytown are not entirely lacking. The new style of buildings will soon push these rickety structures out of the way, for the number of handsome homes in the Drive is steadily and rapidly being increased. Half a dozen or more are now building, and others will be started in the spring. Still, there remains lots of empty space. There is on an average hardly more than one house to a block in the two miles and three-quarters which the Drive stretches along the top of the bluff. It will therefore be a good many years before the vacant lots disappear for the most part.

DISTANCE FROM THE ELEVATED ROAD.

At present, perhaps the only great drawback to Riverside Drive is its distance from the elevated road. A long journey twice a day to and from the station takes something from the enjoyment of the first view, and additional rapid transit facilities will greatly add to the attractions of the thoroughfare.

Unlike the Grand Boulevard, which has several fine new churches, Riverside Drive is at present altogether destitute of religious edifices. Of course it is natural for a church to follow the march of its people, rather than to anticipate it, so the Drive will hardly show many houses of worship for years to come. One disadvantage is that the Drive marks the limit of the residence part of the city, so that churches in it would be on the edge instead of in the centre of the neighborhoods from which they draw their parishioners. When the side streets are more thickly settled, however, the incomparable advantages of situation and view will undoubtedly lead to the building of churches which will be ornaments to the landscape.

The Grant Tomb already attracts many visitors to the Drive, and when the Monument has been well begun it will add to the crowds of sight-seers.

SOME OF THE HOUSES IN THE DRIVE.

Seventy-second-st. is architecturally a satisfactory approach to Riverside Drive, being well built up with houses making more or less pretensions to artistic merit. The lower blocks of the Drive do not, however, contain any noteworthy houses. The New-York Orphan Asylum is a big, solid-looking structure, surrounded by a fine lawn, but it is hardly to be classed among the ornaments to the thoroughfare. The four Lowther houses at Seventy-seventh-st., which form one harmonious edifice, begin the roll of modern residences. They are of granite, with Indiana limestone trimming.

CYRUS CLARK'S HOUSE.

The pitched roof is of corrugated Spanish tiles. The two outside houses are carried up in a circular bay ending in an octagonal tower, with loggras on the fourth floor. In the two middle houses, an octagonal bay runs up from the ground to the second floor, and balconies look from the fourth story. The material of the steps is bluestone, and over the doors are carved panels. The windows of the outer houses have straight arches with carved keystones.

Above the bays of the inner houses are double windows with round arches and Corinthian columns, spirally fluted. Lamb & Rich were the architects, and the houses have been occupied for about two years. Lowther Brothers, the coal merchants, built them at a cost of about $100,000. W. C. Lobenstine, W. Hicks, Charles Lowther and P. Jones occupy the houses.

THE CROSS STREETS NOT AT RIGHT ANGLES TO THE DRIVE.

Between Eighty-first and Eighty-second sts. are four new brownstone houses, just about ready for occupancy. They are unfortunate in not facing the Drive at right angles. The cross streets make acute and obtuse angles with the avenue, so that the houses must be built to correspond, or part of the lot is wasted. This set of houses has windows with flat arches, except on the top floor, where the arches are bowed. The stoops run up parallel to the Drive. While apparently comfortable and cheery enough, the houses make no particular pretensions to artistic merit.

At Ninetieth-st. are two fine houses, the one finished and the other not yet under roof. The completed one is on the southwest corner, and is the home of Cyrus Clark, the retired drygoods merchant. Henry F. Kilburn is the architect. The house has been occupied about three years. Mr. Clark had a plot of generous size, so he could erect a house irrespective of the acute angle formed by the Drive and Ninetieth-st. The building is 48 by 60 feet, excluding porches, and is solid without being massive. The material is Indiana limestone, rock faced. There are three stories and an attic, with a roof of Spanish tiles having terra-cotta finials. At the northwest corner is a round tower with a peaked roof, and verandas face the Drive at the southern end of the house and the street at the eastern end. Panels carved, a shield form part of the ornamentation. In the third story there is a balcony projecting over an oriel window. The chimneys are of stone. Altogether, the house is a characteristic home of a retired merchant of artistic tastes. There is lots of room in it, and the ornamentation is not put on with so liberal a hand as to overshadow the structure itself.

THE UNFINISHED MATTHEWS HOUSE.

Across the street masons are at work on a house which will certainly attract as much attention when it is finished as any other in the Drive. John R. Matthews, the manufacturer of soda water apparatus, who now lives in Brooklyn, is building it and will occupy it when the masons, carpenters and decorators are through with it. Mr. Matthews, like Mr. Clark, has a broad lot, so he too will have a square house despite the obtuse angle at the corner. He has made use of some more or less original ideas—that is, ideas which have not been carried out in this city before. His plan is to have his home a kind of country chateau, and the situation of the house certainly offers advantages for the purpose. Lamb & Rich are the architects.

The characteristic of the house is a free rendering of the Dutch style, which includes broad gables of corrugated tiles and broken by two projections much after the method of the Albrecht Duerer house in Nuremberg. The first and second stories will be of washed brick, with trimmings of terra cotta and brownstone. There will be a big piazza in front with returns on both ends. A balcony with gargoyles will surmount the piazza, and two balconies are to be on the south side. The house will be three stories tall in the main, and the peak roof will probably be of Spanish tiling. The entrance will be in the Drive, and a notable feature will be the porte cochere on the southwest corner. Only one or two other houses in this city are supplied with these convenient arrangements for getting into a carriage under cover. The ornamentation of the house will also be worthy of admiration. The columns of the piazza will have carved caps, and the entrance is to be handsomely decorated. The main door will be in the old Dutch style, and the brackets of the small

SAMUEL G. BAYNE'S HOUSE.

door in Ninetieth-st. will be carved. Terra cotta panels will also add to the attractiveness of the house. All the brownstone used will be from the Croker quarries.

The house will be 80 feet by 135, including the stable, which will, however, be separated from the rest of the building by a court. The two parts will have a continuous roof, and the first story of the section joining them will contain dog kennels. The courtyard ends with an open loggia of terra cotta, which will be one of the most pleasing features of the house. The library, designed in the Moorish style, will be unusually large, 20x41 feet, but the owner evidently believes in comfort and elbow-room. It is impossible to say now just when the house will be ready for occupancy. The cost will be about $80,000 if the present plans are adhered to.

MR. DOELGER'S HOUSE.

At One-hundredth-st., on the north corner, is the home of Peter Doelger, the brewer, which was finished about two years ago. The material of the first story is brownstone, and above that pressed brick. There is a bay on the south side and over the entrance is carved stonework. The ornamentation is not elaborate, but an ample lawn adds to the attractiveness of the house.

Between One-hundred-and-first and One-hundred-and-second sts. is the Foster house, which is on a hill of some height. The house is of iron, painted a kind of yellow, and is built on the old lines, there being little to relieve the angularity. The building looks solid and roomy, however. It is three stories high, and has a cupola on the roof, which must afford a view for many miles. There is a big portico, and two bays stretch from ground to roof. The columns in the various stories are partly square and partly round. The house is not as new as some of the others in the Drive.

On the south corner of One-hundred-and-third-st. is the home of James A. Deering, the lawyer, which may be styled a veteran of the thoroughfare, as it has been occupied about seven years. It is of pressed brick and brownstone, and has a tower on the corner. The roof is of slate. Altogether, the house, while not as ambitious in style as some of the others, is pleasing to the eye.

PROFESSOR BACON'S CASTLE.

Unique among its neighbors is the home of Professor Richard S. Bacon, on the upper corner of One-hundred-and-fourth-st. It is three stories tall, but its height is sufficient for four ordinary floors. The material is rough gray stone, and the parapet running around the roof is machicolated. The architect evidently made some mediaeval castle the prototype of the house. There is little ornamentation, and the general appearance of the place inclines rather to solidity than to cheerfulness. Two bays stretch from the first story to the roof.

THE HANDSOME BAYNE HOUSE.

The visitor to the Drive is sure to stop to admire the two at One-hundred-and-eighth-st., both of which were built by Samuel G. Bayne, president of the Seaboard National Bank, who occupies the lower one. Frank Freeman was architect of Mr. Bayne's home, and finished the other house after it had been begun by another member of his profession. Mr. Bayne's house is of unusual beauty. The material of the first story is Jersey stone, trimmed with Lake Superior redstone, rock-faced. The second story is of Tiffany brick, also trimmed with the redstone. The next story is of Tiffany brick and terra cotta, the fourth being in the tower of Lake Superior redstone which arises on the northwest corner of the house. About the windows on the second floor is elaborate terra cotta work. A copper balcony and bay window face the Drive. The roof of Spanish tiles starts at the cornice over the second story and slopes back from the front, broken by the tower. Plate-glass is used throughout, and the windows in the third story have stained-glass transoms.

The tower is a big square one on the northwest corner of the house, and has an octagonal bay. In the third story on the One-hundred-and-eighth-st. side is a copper dormer. Flower balconies of stone flank the entrance, which is a segmental arch of rock-faced Lake Superior stone, elaborately carved. On the second story is a copper balcony, supported by large terra cotta gargoyles. The chimneys are of moulded brick and carved panels form part of the ornamentation. The Romanesque style of enrichment is used, and with highly successful effect. Mr. Bayne has lived in the house less than a year.

ANOTHER ARTISTIC DWELLING.

The first story of the house across the street is of Jersey stone, trimmed with Lake Superior bluestone. A copper bay one story high faces One-hundred-and-eighth-st., above it being a balcony with a broad arch of Lake Superior stone. The second story is of Tiffany brick, relieved by terra cotta panels. On the north side is a veranda. The entrance has a segmental arch of carved stone. Many of the windows have stained glass transoms. The third story on the north side is a tower, and at the northwest corner is a stone balcony with ornamental grillwork. A conical roof rises above the tower, and a dormer with moulded brick panels overlooks the Drive. The windows have flat stone arches and red slate covers the roof.

TOWARD THE END OF THE DRIVE.

Near One-hundred-and-thirteenth-st. is the pretty home of George Noakes, the retired restaurant keeper. The style is a modification of the Queen Anne, and the material a rough limestone.

Between One-hundred-and-twenty-first-st. and One-hundred-and-twenty-second-st. are two more artistic houses, built two or three years ago, and occupied by Joseph Kiddle and John J. Gibbons. Neither is so elaborate in design as the Matthews house will be, but both are pleasing in style. They finish the roll of residences in the Drive, and are handsome enough not to cause any impression of anti-climax to the visitor who walks or drives up the thoroughfare from Seventy-second-st. The Grant Tomb is nearly completed, and workmen are busy on the big monument which will in time form the Mecca of tens of thousands of patriotic pilgrims.