THE SOCIETY OF THE NEW YORK HOSPITAL AND ITS NEW HOUSE OF RELIEF.

The Society of the New York Hospital has recently completed and put in operation an emergency hospital termed the House of Relief. This building is situated ou Hudson Street, on the corner of Jay Street, in this city, in the heart of the downtown district. The plot of ground on which it is erected has streets on three sides, Hudson, Jay and Staple Streets, in itself a most fortunate circumstance, as affording free circulation of air. The building has been set back from the adjoining building on Hudson Street, so as to form an alley, thus leaving the fourth side also free and giving light and air from all quarters. The structure, which is fireproof throughout, and which embodies all the last refinements in hospital construction, was designed by the firm of Cady, Berg & See, the well known architects of this city.

The old House of Relief, known commonly as the Chambers Street Hospital, occupied an old police station which had been assigned to its uses by the city. But the work long ago outgrew the restricted quarters, and the society determined to build and equip a model hospital for emergency cases. Although its correct title is widely published, the new House of Relief is already receiving the title of the Hudson Street Hospital. This new building is a model hospital and has been selected as the subject of this article owing to the perfection of the methods and the completeness of its equipment. Our illustrations show the work done in different departments, for the operations are classified in three divisions. The first is for emergency treatment of accident and sunstroke cases; the second covers the dispensing of medicines: and the third is devoted to the definite treatment of patients who cannot be sent away to their homes or to other hospitals. The emergency work is the great feature of the house.

The building is shown in Fig. 3 of the cuts. The main entrance is on the center of the Hudson Street front, and to one side is seen the ambulance gate and alley. The ambulance enters by this alley and goes out on Staple Street, at the rear of the building. The entrance of an ambulance is shown in Fig. 5. The gates are held shut by a latch operated from within the building by electricity. When the ambulance arrives, the attendant or driver presses an electric bell push which rings a bell within the building. The electric latch is at once released from within, the ambulance enters and the gate is closed behind it.

If the case is one requiring instant attention, the patient is taken to the operating room on the ground floor, which room is shown in Fig. 8. Here, as through all departments, antisepsis reigns supreme; sterilizers and sterilized solutions are on hand, and the beginning of the treatment is made under the best auspices.

If the case is one of sunstroke, the patient is taken to the special sunstroke ward on the same floor. This is shown in Fig. 7. The apparatus is probably unique. It includes an electric crane of 600 pounds lifting capacity, for raising the patient bodily. A bath tub on wheels is used to receive the patient. This contains water (often ice water is used) for the reduction of temperature by what may be termed a phase of the "heroic treatment." It often happens that the patient is immersed in the cold bath without even having his clothes removed, as expedition in such cases is of great importance. The cot is wheeled next to the tub, to receive the patient as he is lifted from his cold immersion. In the cut the switch for operating the crane is seen on the wall in the background.

The dispensary, which serves a number of patients of all kinds, some of the lowest classes and some of foreign origin, is shown in Fig. 1. Here medicines are distributed without charge to patients of the house. These patients are not all inmates of the building, as there is a special "Out-Patient Department," which this dispensary, to a great extent, supplies with medicines. A visitor going up in the electric elevators will find the surgical room, Fig. 4, on the third floor, fitted up in accordance with the most advanced ideas of modern surgery. Dr. Lewis A. Stimson, the attending surgeon, personally designed the arrangements. Here amputations and other capital surgical operations are conducted, always under most perfect antiseptic conditions.

On the same floor are the reception wards, one of which is shown in Fig. 2. These wards are primarily for the treatment of patients whose condition is too critical to warrant removal to other hospitals. But many patients are received, treated, and dismissed well or convalescent from these wards.

An interesting feature of the building is shown in Fig. 6, the roof garden. This tells its own story. Far above the level of the streets an inclosed space upon the roof has been fitted up for convalescent patients or for those to whom sunlight and air are first necessities. An iron railing surrounds it and a wire netting extends over the top. When in use awnings will be stretched across the top to give shade and exclude sunlight as desired.

The building is adapted for hard use, for in it the most critical cases of injuries, requiring instant treatment, are received. The floors are marble or tile mosaic for the most part. The hose can be turned freely on these, so as to wash down the building from top to bottom. The wooden floors of the wards are of quartered pine, made waterproof by paraffine wax and varnished.

The ventilation problem is dealt with on the forced draught system. Two fans draw air from above the roof and force it into the different rooms through independent ducts, whose outlets, placed high above the floor, are provided with deflecting shields to direct the air upward, so that no draught can be felt. Each of these inlets has a handle, by which the air can be caused to enter at the outside temperature or can be caused to be heated before admission, or hot and cold air can be mixed to get any desired temperature. In addition to the fresh air fans, there are other fans for drawing out the air from all parts of the building, discharging it at a safe distance from the windows or fresh air inlets.

The above is one of many details of construction which are encountered everywhere in the building. Thus the elevators, laundry machinery, pumps, fans, etc., are driven by electricity. It must also be noted that we have described but a small portion of the hospital appliances, for within the restricted area of 50 by 95 feet is a perfect miniature hospital. There is an "isolated room" for suspicious or noisy cases, rooms for the storage of patients' clothes, eight examination rooms, dining and reading rooms for doctors and nurses, besides the kitchen and electric steam laundry.

The Society of the New York Hospital is a corporation whose operations in the amelioration of the ills of humanity date back to January 3, 1791, when their hospital work began. Old New Yorkers remember the building situated on the west side of Broadway, opposite Pearl Street. This was opened for patients on the date given above. It was abandoned in 1869, its present successor being the new building in West 15th Street. The society in 1821 opened the Bloomingdale Lunatic Asylum, now transferred to White Plains, N. Y., the name "Bloomingdale" being retained.

The sources of income include, as main items, the payments of patients for board and treatment, $259,057.37 for 1893, and rents and ground rents, $166,150.36 for the same year. For special expenses bonds are issued and loans made. In the statement of receipts, "Donations, subscriptions, interest, etc.," amount to but $1,797.95 for the year, so that the refreshing spectacle of a great charity run on strictly business principles is presented in perfection by the society's administration. The salary item for medical attendance, owing to the self-sacrificing spirit of the physicians, is nothing. Were the time devoted to the work by the most eminent physicians and surgeons of the country computed and accounted for, the aggregate amount would be enormous. The free bestowal of services by men who receive the highest fees in private practice is a true charity of the most enlightened type. Among the professional men who are thus connected with the work may be mentioned Drs. Thomas M. Markoe, L. Duncan Bulkley, Robert F. Weir, William T. Bull, William H. Draper, James W. McLane, and Lewis A. Stimson. Mr. George P. Ludlam is the superintendent of the hospital work.

Irrigation by Electricity.

It is a well-known fact that in nearly all the arid land regions artesian wells can be obtained at a depth of from 300 to 600 feet, the water in these wells rising to within fifty feet of the surface. In some localities they flow. There are many places where abundance of surface water can be had by digging only a few feet. Especially is this the case near streams. To utilize water power costs much less than steam.

A power plant is imperative. The full capacity of a 10 horse power electric motor will yield power equal to a 10 horse power engine, and, if its capacity be not overworked, will last indefinitely. The same may be said of dynamos without regard to size.

The cost of a 15 horse power motor is $500. Foundations, power house, two 500 horse power dynamos with engines directly connected, and everything ready for operating, could be constructed for about $36,000. The power house, when run by steam, should be placed at a railroad switch. To construct for water power might cost as much, but the operating expenses would be much less.

A 600 foot well can be sunk for $1.500. It takes 27,154 gallons of water to cover an acre one inch deep. A 15 horse power motor will pump 750 gallons perminute, and raise the water fifty feet. Seven hundred and fifty gallons will cover forty acres one inch deep every twenty-four hours, or 280 acres every week. One well will furnish water during the irrigation season, from May 1 to August 31, to cover 280 acres seventeen inches deep. This is an abundance for almost any crop, and a great deal more than most crops require. The water could be pumped into a ditch or reservoir. The well could be sunk where most convenient, as the power comes to it by wire.

One thousand horse power will run fifty-six 15 horse power motors, and will allow 15 per cent loss for transmission of power from dynamos to motor. The lines for transmission, including poles, wires, etc., would cost from $8,000 to $10,000. Thus we see that 1.000 horse power would furnish an abundance of water for fifty-six times 280 acres, or 15,680 acres, about 24½ sections, at a cost, not including ditches and reservoirs, of about $160 000—a very little over $10 per acre. A larger amount is often expended in clearing some Eastern lands of timber and stones.

It takes three pounds of coal per horse power per hour, or 72,000 pounds for twenty-four hours, at a cost of from $1 to $2 per ton, according to freight, or $72 per day for coal. The other power house expenses, including oil, can be run for $18. One man, with the use of a horse, can look after ten motors, making an expense of $10 per day, giving a total operating expense of $100 per day, or $12,300 for 123 days, the entire irrigating season, less than $1 per acre.

In valleys where the fall of streams is not sufficiently rapid to admit of taking out ditches, ditches can be built, the stream dammed, and the water raised to the required height by pumps through means of pipes, each pump working by motor. It makes little difference whether the water be raised perpendicularly or otherwise.—Irrigation Age.

Narragansett Bay Defenses.

The fortification of Narragansett Bay has long been regarded as a most important matter. The great number of army and navy equipments it contains makes it a very important station, and the measures taken to provide for its defense are therefore on very ambitious lines. It is reported that the torpedo defense of the bay, planned some months ago, is now nearly completed and ready for its equipment. The torpedo casement, which is the last stage of its development, is practically finished. On Dutch Island, another stronghold, the work is about complete, and the torpedo mines in both the main and west entrances to the harbor will soon be placed in position. These are to be connected by wires with the casement on shore, and may thus be set off singly or collectively, without doing any damage to the casement itself. Mortar batteries and modern guns are also being built to equip the casement. A request will be made of the next Congress for funds to construct a mortar battery for Narragansett Bay similar to the one in Boston Harbor. The foundations for such a battery may be commenced in the near future. The mortars will be of the new breech-loading pattern. The defensive measures will be completed as early as possible. The mines will of course not be put in position until it is a possibility that there will be actual use for them.

To Obtain Pure Serum.

A philanthropic citizen has recently placed $30,000 at the disposal of the Health Department of New York City for the purpose of providing an adequate supply of pure anti-toxine serum. In view of the large death rate from diphtheria in New York at the present day this provision is of the greatest importance. The necessary animals and laboratory equipments will be secured immediately, and it is expected that the first supply of serum will be ready by the first of the year. The serum is at present very costly, but it is hoped that in time it may be put upon the market to be sold as cheaply as vaccine virus.

In a report made recently to the Board of Health by Dr. Cyrus Edson, it was stated that several spurious concoctions of anti-toxine serum have been placed on the American market. And it was urged that the grave consequences following such fraud necessitated the prompt and vigorous action of the health department. Acting upon this advice it was resolved that measures should be taken to supervise the sale of this valuable remedial agent by a scientific and thoroughly systematic inspection of all preparations. The detection of such fraud will lead to the trial and severe punishment of the offenders. The preparations occasionally furnished from Germany have specific guarantees as to their strength and purity by reliable scientists. It is to be hoped that some similar provision may be made to guarantee the use of pure serum in America.

The Omnivorous Shark.

Secretary L. H. Shearman, of the New York and Pacific Steamship Company, has received a letter from M. P. Grace & Co., of London, describing a curious incident. At Terre de Cap Dessaintes, Guadaloupe, in the West Indies, a shark was killed recently, and when it was cut open there were found in its stomach a package of inventories, invoices, and other documents originally placed in the hands of the purser of the steamship Capac. of the New York and Pacific line, which sailed southward from this port on her maiden voyage on Nov. 10, 1893.

The papers which were lost on the voyage and found in the shark's belly were duplicates and of no particular value; hence little attention was paid to their disappearance.

Trial of the Langley Aeroplane.

On the afternoon of December 8, in a landlocked bay at Quantico, Md., with only fishermen for spectators, a trial was made of Prof. Langley's new aeroplane. For some time past preparations have been made for this trial in a workshop at the rear of the Smithsonian Institution, of which Mr. Langley is the honored secretary. Quantico is a village on the west side of the Potomac, about thirty miles from Washington. A small workshop has been installed on a scow which is anchored in the narrow channel between the mainland and an island. To the roof of this workshop the new machine is suspended. Quantico is admirably suited for experiments, as it is not likely to be frequented by inquisitive visitors. The shape of the new air ship is somewhat like that of a porpoise. The wings incline upward and the machine is suspended much as a kite is held in mid-air, only in place of the wind and strings are a pair of rapidly revolving screws. After experiments on different forms of motive power, Mr. Langley has decided that a light steam engine is preferable to the heavy storage battery.

The trial was conducted in a rain. The machinery was started and when the proper degree of tension was reached, it was released. The great aluminum bird, measuring ten feet from tip to tip of the wings, rose slowly in the face of the wind and sailed away for some distance. It then alighted upon the surface of the water, where it floated. It was picked up by a rowboat and brought to the scow.

Although the experiment was successful, much remains to be done to perfect the air ship, and to make it more dirigible. The aeroplane is subject to strange eccentricities of motion, and these must be guarded against before a long flight can be attempted. The world is watching with interest the experiments now being conducted by two American inventors, one in America, the other in England, Langley and Maxim. For four hundred years the minds of men have been occupied by the problems of aerial flight, and there now seems a good prospect of their practical solution before the close of the present century, especially when the experiments are conducted by men of such high standing. The time has arrived when the perennial jokes regarding "flying machine cranks" have lost their point.

Novel Music Boxes.

Among the Christmas novelties of the present season a number of very curious adaptations of the music box are to be found. The Swiss musical boxes are the most elaborate and ingenious. They come in all shapes and sizes. Beer mugs, for instance, are fitted with a false bottom containing a music box, so that a German may drink his beer to the music of the "Watch on the Rhine," and there are all sorts of musical flower pots, cigar temples, workboxes and artificial birds supplied with similar mechanisms. Perhaps the most curious form, however, are the musical statues and the model crucifix playing a Te Deum. Many forms of sacred relics may also be bought which play well known pieces of sacred music. These toys vary in price from $2 to $250, and some made especially to order bring much higher prices.

THE NEW MANHATTAN LIFE BUILDING

THE MANHATTAN LIFE BUILDING.

We publish in this issue illustrations of the Manhattan Life Insurance Co., another of the buildings of extraordinary height which are gradually transforming the appearance of this city. In its construction it represents the most advanced type of steel frame construction, and in putting down its foundations the pneumatic system with steel caissons was applied for the first time to the foundations of an office building.

It rises 347 feet above the sidewalk, and its foundations go down 53 feet below the same level, which brings them 20 feet below tide water level, making a total of 400 feet. This building is probably the highest office building in the world, and some idea of its enormous altitude may be obtained by comparing it with some of the well-known types of high building construction. The Masonic Temple, in Chicago, is 302 feet high above the curb; Trinity Church spire, in New York, for a long time the highest pinnacle in the city, is only 284 feet high; the statue of Liberty, in the harbor of New York, rises 301¼ feet from the water level; the dome of the Capitol at Washington is 288 feet high. It is only by such comparisons that the height of this building can be realized.

The architects were Messrs. Kimball & Thompson, of this city. The front, of granite, is of beautiful design, which is well brought out in our cut. The rear, on New Street, is of buff brick, and the exposed side walls, of red brick, have been painted to correspond. Our thanks are due to the firm for many courtesies extended.

The foundations, which consist of fifteen masonry piers, are carried by the same number of steel caissons. The latter were sunk to bedrock by the pneumatic process. One of our cuts illustrates an interesting phase of the work, in which an air blast, caused by the outrush of air through a pipe connected with the interior of the caisson, acted as an elevator and forced out the material excavated by the shovels of the workmen. The loose material was shoveled into a receiving chamber or funnel, and the ordinary air pressure in the lock carried it up to the surface of the ground, where it was free to be carried away in the usual way.

The caissons, after reaching the desired level and after the rockbed had been cleaned, were filled with a concrete, consisting of 1 part of Portland cement, 2 parts of sand, and 4 parts of broken stone. The brick piers, which were built upon the caisson as it descended, were laid in a mortar consisting of 1 part of cement and 2 parts of sand.

The front of the building, made of solid granite, is practically self-sustaining, while most of the rest of the building is carried by the steel frame, which includes 32 columns distributed over the 15 masonry piers. The calculation of strength is such that every square foot of the floors

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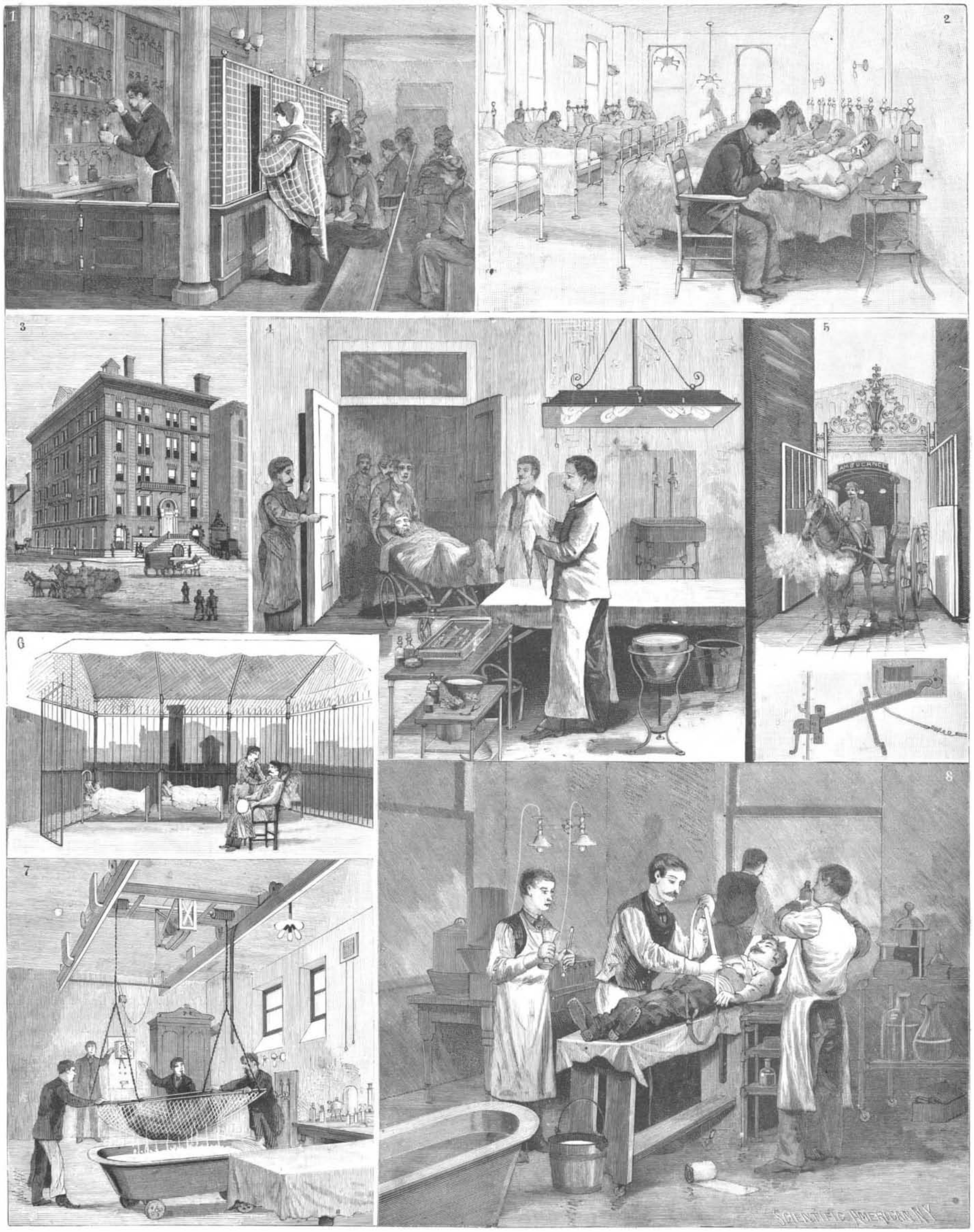

1. The dispensary. 2. Reception ward. 3. Exterior view. 4. Surgical room. 5. Ambulance entrance. 6. Roof garden. 7. Sunstroke ward. 8. Reception operating room.

THE HOUSE OF RELIEF OF THE NEW YORK CITY HOSPITAL.—[See page 391.]