vessel is to be transformed into a torpedo boat destroyer at the Brooklyn Navy Yard under the supervision of Naval Constructor Bowles. She will be armed with rapid-fire guns of sufficient power to insure her sinking such torpedo boats as her 17-knots speed will enable her to overhaul. This catching of torpedo boats will not be so difficult a task as might be supposed, for these little craft are only capable of high speed under the most favorable conditions of wind and sea.

The purchase of several other swift merchantmen, yachts and ocean-going tugs is also under contemplation by the Board.

REPORT OF THE COMMISSIONER OF PATENTS FOR 1897.

In the SCIENTIFIC AMERICAN of January 29 we published an advance statement of the business of the United States Patent Office last year, to which but little is to be added from the official report of the Commissioner, which has just appeared. A full abstract of the report appears in the current issue of the SCIENTIFIC AMERICAN SUPPLEMENT. The report is made by Acting Commissioner A. P. Greeley, upon whom the duties of the office devolved for so great a portion of the year, on account of the illness and subsequent death of the former Commissioner, Gen. Butterworth, and shows the largest business ever before transacted in one year in the history of the Patent Office, there having been 47,904 applications for patents and 23,794 patents and reissues. The receipts of the year were $1,375,641.72, or $252,748.59 above the expenditures—and the latter amount, carried to the balance already standing in the Treasury of the United States on account of the patent fund, brings the total up to $4,971,438.06. It is perhaps futile, at this juncture, to more than call attention, as we have done so many times before, to the substantial wrong inflicted upon inventors by the diversion of so great a sum from the fees which they have paid to the government, when the needs of the Patent Office for a larger force of examiners and clerks, and for more commodious and convenient quarters in which to transact the business, are so well known. The appropriations made by Congress for the work of the office have been so meager that, although the fees received for patents are so largely in excess of the expenditures, it has not been possible to increase the force or facilities to meet the steadily enlarging field of work, and the number of applications awaiting action at the close of the year was 11,382, of which 7,858 had not been taken up for examination. Many of these applications had been waiting three or four months for examination, and some of them more than six months, to the serious injury of the applicants and the detriment of the public.

Of the patents granted last year, more were issued to citizens of Connecticut, in proportion to population, than to those of any other State—1 to every 786 inhabitants. Next in order were: Massachusetts, 1 to every 1,180; District of Columbia, 1 to every 1,316; New Jersey, 1 to every 1,377; Rhode Island, 1 to every 1,421; New York, 1 to every 1,585. The fewest patents in proportion to inhabitants were: South Carolina, 1 to every 38,371; North Carolina, 1 to every 17,397; Mississippi, 1 to every 16,120; Alabama, 1 to every 15,598; and Georgia, 1 to every 14,133. Of patents granted to citizens of foreign countries, 706 were for England, 551 for Germany, 286 for Canada, 222 for France, 58 for Austria-Hungary, 48 for Scotland, 45 for Belgium, 44 for Switzerland, 32 for Sweden, 30 for New Zealand, 30 for Victoria, 21 for Russia, 19 for New South Wales, 17 for Ireland, 13 for the Netherlands, 10 each to Denmark and Italy, 9 each to India, Mexico and South African Republic, and 5 each to Norway and South Australia.

The development of industries through patented inventions is treated of at some length in the report, and attention is called to the number of inventions of the highest industrial and commercial value for which the patents have expired. These include the cotton gin, the sewing machine, the self-binding harvester, barbed wire fencing, the roller mill for flour milling, the sulphite paper process, the dynamo and electric motor, important inventions in typewriters, the telephone, and many others, in the earlier forms in which they were brought before the public. It is to be remembered, however, in regard to most patents of high importance that the original inventions afford but the first steps in opening up new and more varied fields of industry, calling for additional improvements and the exercise of further inventive genius.

It is noted that the most remarkable industrial development, due principally to patented inventions, is in the line of electrical work, and within the term of patents now in force or but recently expired. This includes the manufacture of electrical apparatus and supplies, the furnishing of electricity for lighting and power purposes, electric railways and the telephone, an enormous industry, which has grown up entirely within the last twenty years. Although the electric railway is only about ten years old, the total mileage of these roads had increased, up to October last, to 13,765 miles, with an invested capital of about $1,000,000,000, and the manufacture of cars and motors to meet this great demand has become a regularly established industry affording employment to many thousands.

The bicycle industry is also referred to as showing a most wonderful development, the product of 1897 having been over 1,000,000 wheels, and the exports of cycles for the year being valued at $6,902,736. The numerous industries which contribute to this manufacture, and the great number of inventions by the means of which it has been brought to its present state of perfection, are matters of common knowledge.

Among other comparatively new industries, specially noted as peculiarly the product of our patent system, are the manufacture of typewriters and typewriter supplies, the cash register and cash carrier, photographic apparatus and materials, the development of the basic steel business, the manufacture of aluminum, etc., the Commissioner concluding that "to the stimulus afforded by the Patent Office is due the creation of these new industries and the very great development of recent years in the older industries. It is to the stimulus to invention given by our patent system that the great increase in our exports is largely due, and it is on American invention, as fostered and stimulated by the patent system, that we may confidently depend for ability to maintain the high rate of wages paid to American workmen, and yet compete successfully in the markets of the world with nations where the workman receives but a meager return for his labor."

THE NEW NAVAL WAR GAME.

In the current issue of the SCIENTIFIC AMERICAN SUPPLEMENT we publish a paper descriptive of a naval war game which is being played by naval officers on the other side of the water. It is intended to represent on a board the actual conditions which would obtain in a modern naval fight, and it is claimed by naval experts that it does this with such success that the game is at once a valuable training to the officers and a test of the comparative values of the various types of warships.

The full details of the game, which represents over ten years' work upon the part of the author, have not yet been published; but the published data shows that it is played upon a board ruled into squares, representing the scene of action, the ships being represented by small models which are moved at their respective speeds (ten, fifteen or twenty knots, as the case may be) at the will of the commanding officers. The game may be played as a duel between two ships or as a fleet action between a large number of ships. The models represent actual ships, and one player is assigned to each ship. The various elements in a warship, such as armor, guns, speed, etc., are assigned certain values by points, and as the game proceeds, the players, it would appear, are awarded so many points by the umpires, according to their tactics.

It is claimed that the victory usually falls to the stronger ship or fleet—a fact that would seem to prove the correctness of the theory upon which the game is based. At the same time, there are certainly exceptions to the rule, as in the case of a game recently played, in which the United States battleships "Indiana," "Oregon" and "Iowa" were pitted against double the number of Spanish ships, viz., the battleship "Pelayo," the three armored cruisers "Teresa," "Cristobal Colon" and "Viscaya," and the destroyers "Terror" and "Furor." Here, in spite of the numerical superiority of the Spanish, the American ships, with their heavy guns and thick armor, would be almost certain to win. As the game worked out, the balance was slightly in favor of the Spaniards, owing chiefly to the distraction afforded by the attempt of the destroyers to torpedo the "Indiana" and "Oregon," which diverted the fire of these ships from the Spanish armorclads. It is considered that, in nine chances out of ten, the game would result in the victory of the powerful few over the individually weaker many.

THE DEVELOPMENT OF EGYPT.

An important step in the development of the Nile Valley has recently been taken in the formal ratifying by the Khedive of the contract for the construction of two large reservoirs on the Nile. The work is planned on a large scale and includes the construction of two great dams across the river, one at the cataract at Assuan and the other at Assiut. At Assuan the waters will be impounded by a granite dam which will be built upon the granite reefs which form the cataract. Its crest will be about 76 feet above the river bed at its deepest point and the total length of the dam will be about 6,000 feet. The difference in the water level in the wet and dry seasons will be about 45 feet. It will be pierced with sluiceways to permit the flood waters to flow through without any considerable backing up in the reservoir.

In the fall of the year, when the waters have carried down their valuable burdens of silt for the enriching of the Nile Valley, the sluice gates will be shut down and the reservoir allowed to fill. The season of low water lasts from April till August, and during this period the sluice-gates will be opened sufficiently to keep the waters of the lower Nile at the proper level for irrigating the sugar, cotton and rice fields. It is calculated that the amount of water impounded will be sufficient to supply the lower valley until the next season's flood waters come down. If the scheme is successful, the Egyptian husbandman will be able to irrigate his fields throughout the whole year.

The Assiut dam is to be built for the purpose of raising the level of the river during the summer and increasing the supply in the canals of lower Egypt. It will be built on the lines of the celebrated barrage of the Nile, which is situated just to the north of Cairo. This important work is to be completed in five years, and its effect upon the districts affected will be to enormously increase the value of the land and the prosperity of the people.

STREET CAR SERVICE ACROSS THE BROOKLYN BRIDGE.

The new trolley car service across the Brooklyn Bridge has now been running long enough for the public to judge of its value. There can be no doubt as to the relief which it has afforded to the congested travel on the regular bridge cars, particularly in the rush hours. The crowding, indeed, seems to have been transferred to the trolley cars, which are particularly attractive to that part of the public to which rigid economy is an absolute necessity. Residents in Brooklyn can now make the journey from the outlying districts to the City Hall Park, New York, for one fare; and while the journey takes longer to accomplish than it does over the elevated roads and the regular bridge cars, the small difference in cost is sufficient to attract a large amount of suburban travel. The effect of the new service is plainly noticeable on the elevated roads, which, while they retain most of the long-distance travel, are losing a considerable amount of travel to and from points nearer the bridge.

It is estimated that the trolleys provide an additional capacity of 15,000 passengers per hour in each direction, and, as was expected, there has been a large reduction in the receipts of the regular bridge cars. Hitherto the revenues of the bridge have exceeded its expenses; but it is evident that some readjustment will be necessary, either in the shape of retrenchment in the operating expenses or assistance from the city funds. If the last expedient becomes necessary, the public will ask why the consideration paid by the trolley companies for the use of the bridge was not placed at a higher figure.

The cars are run on the inside of the roadways, and at the New York end they cross the footway beneath the terminal station in four parallel loops. A large force of men is stationed at the loops to prevent accidents and assist the people on and off the cars. The arrangement, thanks largely to the intelligence of the passengers, works satisfactorily; and altogether we think the new venture may be voted a success as helping to solve one of the most serious rapid transit problems in this city.

EATING BEFORE GOING TO BED.

A writer in Italia Termale, quoted by The National Druggist, December, is not much in favor of the theory that late suppers are injurious. "He declares, in fact," says the latter paper, "that many persons who remain thin and weakly, in spite of all precautions in regard to diet, etc., owe the fact largely to habitual abstemiousness at night. He says, very truly, that physiology teaches us that, in sleeping as in waking, there is a perpetual waste going on in the tissues of the body, and it seems but logical that nourishment should be continuous as well. The digestion of the food taken on at dinner time, or in the early evening, is finished, as a usual thing, before or by bedtime, yet the activity of the processes of assimilation, etc., continues for hours afterward; and when one retires with an empty stomach, the result of this activity is sleeplessness and an undue wasting of the system. 'All other creatures,' says the writer, 'outside of man are governed by a natural instinct which leads those having a stomach to eat before lying down for the night.' The infant, guided by the same instinct, 'takes the breast' frequently, in the night as well as day, and if its stomach is allowed to remain empty too long, it shows its discomfort by noisy crying. The digestive organs have no need for repose, provided, always, that the quantity of nourishment taken within the twenty-four hours does not go beyond the normal limit. The fact that the intervals between meals is short works no inconvenience, but, on the contrary, tends to the avoidance of feebleness, which is the natural result of an interval extended to too great a length. Feeble persons, lean and emaciated people, and, above all, those suffering from insomnia, owe it to themselves not to retire without taking some nourishment into the stomach—bread and butter, a glass of rich milk, a few biscuits ('crackers'), or even a bit of juicy cold meat, for instance. We quite agree with the writer in all that he says in regard to the folly of the idea of the harmfulness of a light lunch before retiring."