

SCIENTIFIC AMERICAN

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AUSTRALIAN COAST DEFENCES.

Some time since, the Government of Great Britain withdrew the troops which were usually kept doing a kind of garrison duty in the colonies, and left the colonial administrations to defend themselves from any sudden attack, of course holding itself in readiness to dispatch ships and regiments to any place as soon as the news of intended or actual hostilities reached a military or naval station. The Australasian colonies have, therefore, constructed floating batteries and men-of-war for harbor and coast defence, which are, for the most part, manned by volunteers.

We publish herewith an engraving of a powerful ironclad, the *Cerberus*, belonging to the colony of Victoria. She cruises around the mouth of Port Philip Bay, and is powerfully armed, carrying four heavy guns throwing shot weighing 400 lbs. each. The guns are erected in two bomb proof revolving turrets; and the deck of the ship, when she is ready for action, is only about 26 inches above her water line, the vessel then drawing about 16 feet 6 inches of water. An additional revolving turret, carrying 1 gun, is placed in her bow, and a similar one in her stern. She is propelled by twin screws with four blades each, driven by powerful engines.

The Peabody Dwelling Houses in London.

According to the *London Daily News*, there are now ten blocks of improved dwellings for the poor of London, to testify of the wisdom and generosity of George Peabody. The last, still in the course of erection, promises to be the largest of all, for it stands on five acres of ground and numbers thirty-six blocks, twelve already far advanced.

Of the completed congeries of homes already opened, the latest is in Southwark street. It is a substantial building of twelve blocks, and, taking the average of four in each family, will supply house room for about one thousand persons. In each block there are twenty-two tenements, a few consist-

ing of one room, some of two, and many of three, but each absolutely self-contained, and all as private as if they were flats in Victoria street, or in the Rue du Faubourg St. Honoré. The three room tenements consist—to take an average example—of a kitchen 15 feet by 12, a bedroom 16 feet by 14, and a second bedroom 12 feet by 16. The floors are boarded over, the walls are cemented, and all are at present beautifully white. There is a fireplace in each room, that in the kitchen being furnished with a capital oven and boiler. There are several cupboards, one in the kitchen having over it a meat safe, with doors of perforated zinc. In the passage outside is a coal bin of neat and ingenious construction, capable of holding half a ton. On each flat there is a laundry, with copper boiler, a wringing machine, and mangle. This is devoted to the use of four families, who have the privilege of occupying it by turns one day a week. Each flat has a dust shoot, the tenants having no further trouble than to open it and drop down the contents of their shovels. Nor does this conclude the list of special accommodations in these wonderful mansions. In an underground room of each tenement there is a capacious bath, to which the tenants have access without charge, and as often as they please, there being no other necessary preliminary than that of calling at the superintendent's office for the key. Gas is provided in the wash houses and through the roomy staircases, also at the expense of the trustees. The rent of a three-roomed tenement is \$1 38 a week; for two rooms, \$1.08, and for one room, 72c.

A striking feature of the management of these dwellings is the absence of arbitrary interference with the liberty of the tenants, the few simple rules enforced looking simply to the order, cleanliness, and general good of the community. Rents are insisted on weekly in advance, and the houses are always full. The tenants are strictly of the laboring classes, it being an unprinted rule of the place that no man earning more than \$5, or at most \$6 a week, is eligible for ad-

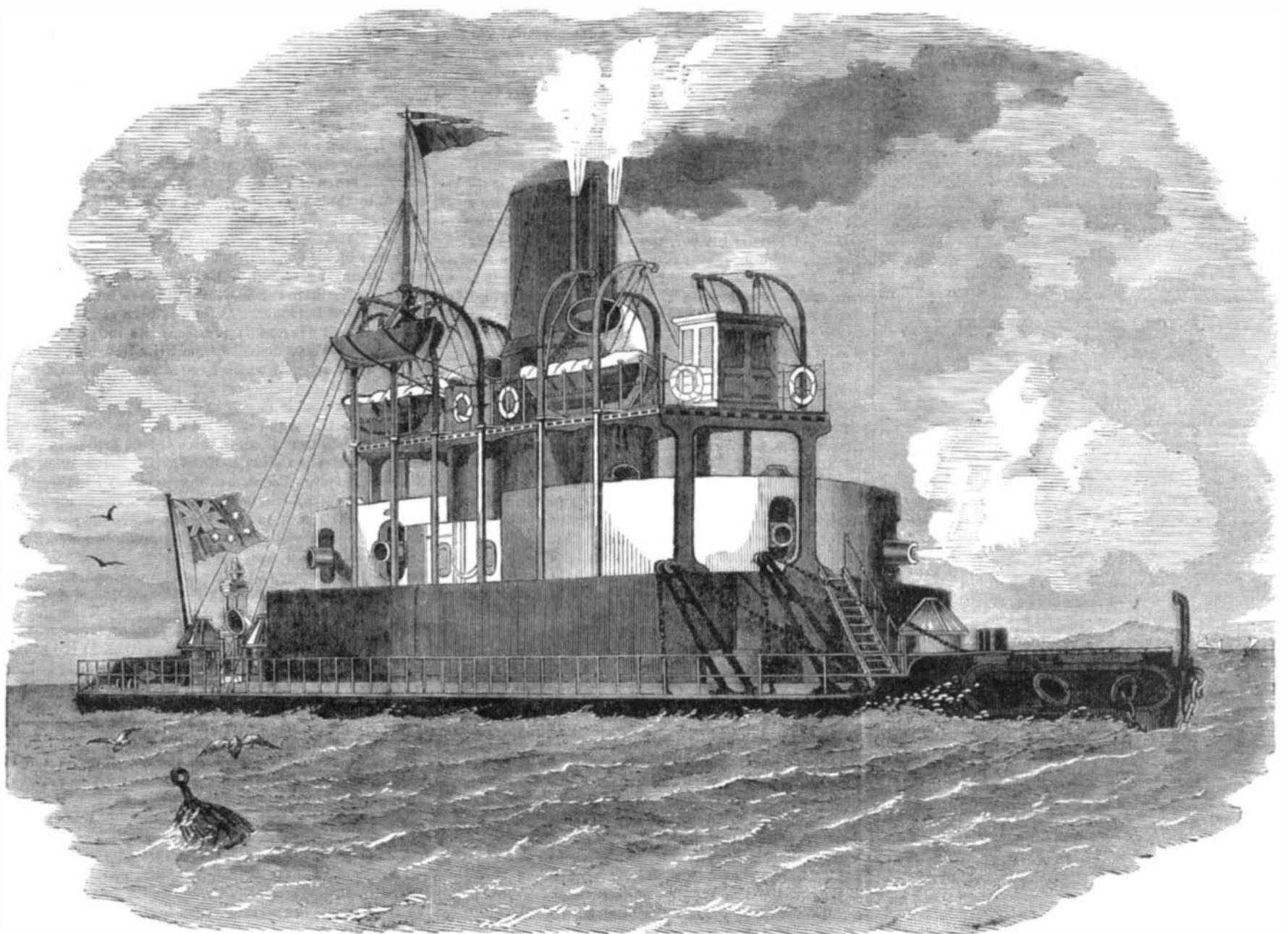
mission. Nothing else is required of an incoming tenant further than a voucher of his respectability, generally sought at the hands of his employer; and other things being equal, the superintendent makes a practice of giving the preference to families where the bread winner is engaged at a distance not too remote to prevent his returning home to take his dinner with his family.

In the aggregate, the population of the Peabody buildings is already not less than ten thousand persons. As the buildings pay a small interest on the money invested, and there is besides the interest on \$2,500,000 to be used in the erection of new buildings of the sort, their increase of capacity is almost limitless.

The Sardine Trade-- A New Utilization of the Grasshoppers.

It is officially reported by the French Minister of Marine that the sardine fisheries are gradually diminishing in yield. The reason is not that the fish are becoming scarce, but that the supply of bait used, the roe of the codfish imported from American fisheries, has become inadequate to meet the demand. It has lately been found, however, that grasshoppers, pounded into a paste, imitate the roe so exactly that the most knowing of the sardines cannot distinguish the difference; and accordingly the French government has imported large quantities of the insects from Algeria in order to try the new bait on a large scale. This fact of the grasshoppers being good for fish bait might be looked into somewhat further here, and it may appear that the insects which yearly ravage our western country, may be turned to good account for catching fish indigenous to our waters.

It is interesting to learn, *apropos* of sardines, that the United States is the largest consumer of the fish, which are exported, as is well known, in tin cans packed in oil; but on the other hand, it has been discovered that fully 40 per cent of the fish which we buy as sardines are not genuine, but are young



AN AUSTRALIAN MAN-OF-WAR

sprats, mackerel, and other common species. A syndicate has lately been established in France to watch exports in the future, and prevent the sale of such fish as are not genuine and of marketable quality. The ordinary yearly production of sardines in France now reaches 500,000 cases.

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INDUSTRIAL ART.—SOME THOUGHTS FOR THE CENTENNIAL.

A correspondent, referring to our recent editorial on what working men might contribute to the Centennial, in which we deprecated nickel or silver plating on handmade metal articles, and suggested file, polishing as a more workmanlike finish, asks whether we are not opposed to ornamentation of machinery or tools, and whether we do not think that artistic design is superfluous in implements or materials meant for "solid work." To this, we reply emphatically in the negative; and we have a few remarks to offer relating to the subject, which may be timely in their bearing upon the approaching exposition of our industries. It may be laid down as an unfailing rule that, when any person is given the choice of two articles, identical in every respect save that of grace of form or beauty of decoration, the handsomer will certainly be selected. This appears to be a simple enough proposition; but when it comes to be applied to great classes of manufactured products, those who make the latter seem to forget it, or at most to accord to it but very little attention. The majority of mankind even go further in their predilection for the tasteful, and in nine cases out of ten will prefer an inferior article of beautiful design, to a really superior object of homelier appearance, the gain in beauty compensating for the lack of usefulness. Several times a year dry goods dealers heap their counters with fabrics of elegant patterns; out of a variety of styles perhaps half a dozen may be "the rage," simply because of their beauty. As a result the resources of the manufacturer are taxed to the utmost to produce the particular kinds of goods demanded, and both manufacturer and dealer gain large profits on the favored fabrics. And yet these very goods may be identical, in every thing but dye or mere pattern, with whole bales of material which the dealer can scarcely get rid of at any price. The same is true of carpets, of wall paper, of crockery and glassware, of any of the varied products into which artistic design may enter. People will pay for beauty, pay for it on a scale which cannot be measured by any standard. They may examine their purchases for other qualities never so closely, may gage durability or strength or efficiency or internal composition to hairbreadth accuracy; but artistic finish and tasteful form defy us to judge how much money is commensurable with a given amount of elegance.

Not long ago a very wealthy merchant of this city paid \$60,000 for a single painting about four feet in length by less than 3 feet in height. From a purely utilitarian point of view, the picture was a mere bit of painted canvas, useless even as a fire screen; from an æsthetic standpoint it represented a fortune. The same merchant lately paid \$9,000 for a block of marble. As a hitching post, that block would have been worth its cartage to the place where it was needed; as a sculptor's masterpiece, possessing exquisite beauty, its value exceeded even the large sum paid for it. We can proceed a step further, and glance at the amounts which, as a nation, we pay out for mere beauty. During the three months ending September 30, 1875, we imported \$1,749,655 worth of fancy goods, such as Vienna trinkets, Swiss carvings, etc., \$310,429 worth of paintings, statuary, and photographic pictures; and to this perhaps should be added \$181,665 worth of jewelry and precious metal work. In the year 1875, we imported fancy goods worth \$6,005,940, figures indicating nearly threefold the value of the similar imports of 1865. So much for the beauty we buy of other nations. Let us now compare these figures with those representing the artistic articles that we sell. For the three months above mentioned our domestic exports of fancy goods amounted to \$90,250, of jewelry \$19,307, and of paintings, including engravings, \$46,079. Fancy articles we do not find quoted at all on the yearly tables; nor have we any such industry as their exclusive manufacture. For the quarter of 1875, however, we imported \$2,241,759 worth of articles valuable principally for their beauty, and exported the same to the value of only \$155,636.

To carry out our examination of this subject still further, we give here a list of the numbers of all persons engaged in artistic pursuits or callings which have for their end the decoration of raw products. There are 775 painters, 250 sculptors, and 2,943 general artists, 108 teachers of drawing and painting, 2,017 architects, 1,169 artificial flower makers, 208 bone and ivory workers, 79 bronze workers, 7,558 photographers, 4,226 engravers, 569 galloon and tassel makers, 1,534 gilders, 18,508 gold and silver workers, 970 mirror and picture frame makers, 85,123 painters and varnishers, and 223 plaster molders. Total 126,265. This aggregate is a little larger than that of all the teamsters and dairymen in the country; it is very much less than that of the blacksmiths, and it about equals that of the teachers. In fact, adding together the number of teachers who educate us, and the aggregate of those whose labor involves our artistic culture and refinement, we have a sum which just about equals the total number of tailors and milliners, and is 40,000 less than the total number of clerks.

Abundant evidence, similar to the above, can easily be adduced, first, to show that we import a very much larger quantity of artistic productions than we export, and that but a very small portion of our population is devoted to pursuits of an artistic or semi-artistic nature. What is true of individuals is equally true of nations. France, pre-eminent as the designer of beautiful wares, buys of us \$50,000,000 worth of iron, and machinery, and provisions, and sends us \$63,000,000 worth of articles, most of which find their way to the stores of the jewelers, the china dealers, and the picture sellers. Italy sends us \$2,000,000 worth of art work in excess of the \$7,000,000 in staples which we send to her shores. With the exception of these two countries, which for ages have led the world in tasteful and ar-

tistic productions, our exports to every other European nation are far in excess of our imports.

In face of all this, it is difficult for any one to see how the country can be otherwise than benefited by the fostering of art culture to its full extent among our workmen. The old world is tributary to us for rough and raw products, and for new means of manufacturing them. We are tributary to the old world for the means of gratifying artistic tastes which cultivate and refine. Let us develop the artistic ability which lies in us, and we are tributary no longer. Let us make our manufactured productions as elegant in shape, as graceful in design, as those of France, and then, and not until then, will we enter in fair competition with that country or any other artistic nation in foreign markets. Nor should we imitate. Copying is but servile work; originality in design the world seeks, praises, and pays for.

The above views we commend to the careful consideration of exhibitors at the Centennial. Many people, we have heard, propose showing machines taken straight from stock without further embellishment or ornamentation; others intend to send samples of their goods irrespective of pattern or design, trusting in the intrinsic excellence of the articles to secure notice and future custom. We think this is a mistake. It costs little to ornament a machine tastefully, and discrimination in selecting the handsomest patterns is easily exercised. The advantage gained will, in a collection of such entries, be twofold: first, we will show the world that we are able to produce tasteful and artistic designs, and, second, we shall have prepared a collection of models of industrial art which will be of the greatest value as an educator and in exciting the emulation of our own people.

A RAILROAD ACROSS THE EASTERN CONTINENT.

The great feat accomplished by the United States in connecting the Atlantic and Pacific Oceans, by a railroad across the United States, is stimulating enterprise in Europe; and it is now proposed—indeed the plan is matured—to connect the Atlantic and Pacific Oceans by a railroad through Central Asia. At a conference of the geographers recently held, Colonel Bogdanowicz explained some of the details of the road, which, it is expected, will overcome one of the great obstacles to the extension of civilization, namely, the separation of a large part of Asia from Europe by vast deserts, in which no means of transit but a railroad could be of any use. A railroad alone can develop the resources of the many lands through which it would pass; and as the mineral wealth of Siberia and the Ural Mountains is well known, the exploration and mining of these regions would be encouraged, and their resources developed.

It is proposed that the road shall start from Nijni-Novgorod, in Russia, where is now the extreme eastern station in the network of European railroads; it will run along the Volga to Kazan, then up the tributary of the Volga, the Kama, to Ekaterinbourg, on the Asiatic side of the Ural Mountains, then enter Asia, proceed in the direction of Troumen and Omsk at the Irish, cross that river, and proceed by way of Kainsk to Tomsk on the Tom, a branch of the Obi, and cross that river. Tomsk is the principal center of commerce of Western Siberia; and thence the road will run directly to Irkutsk at Lake Baikal. Thence the road is to pass to the frontier of China, and then it is no longer an exclusively Russian, but an international undertaking. And here, also, the only serious engineering difficulties commence, at the mountain range of Kinghan, which, in its northern part, is crossed by the Amoor river. This range is the greatest obstacle: and it will be necessary to pass by the Mautchooria, and to lay the road from Baikal to Verhnéoudinsk through the valley of the Selenga. Then the best route by which to reach Pekin, the capital of China, near the Yellow Sea (a bay of the Northern Pacific Ocean) has been found to be that of Tchita and Dolounor. At the southern end, the famous great wall will be crossed; it already lies in ruins in many places. The whole distance from Nijni-Novgorod to Pekin will be 4,500 miles, of which 3,800 run through Russian territory.

When this plan is closely examined, according to known topographical data, the apparent difficulties dwindle down to nothing when compared to those encountered in the western section of our Pacific Railroad. The first section, from Nijni-Novgorod to Tomsk, runs on perfectly level land (the so-called steppes), similar to our prairies. In the second section, from Tomsk to Lake Baikal, the country is rolling, and interspersed with rivers and streams; but the greatest height is only 3,500 feet, and the largest rivers are but of very moderate width and depth. The only serious difficulties, as we have said, lie at the Chinese frontier, and they are inferior to those overcome in the Rocky Mountains and the Sierra Nevada by the American engineers.

Russia has raised in 15 years more than \$1,000,000,000 with which to construct 15,000 miles of railroad, and can easily find \$300,000,000 or \$400,000,000 to construct a line of such value to all the civilized world.

THE EDUCATION OF CROWS.

In the battle of wits between the gamekeepers and the crows of Germany, the latter are said to have acquired the ability to count as high as six—rather more than some tribes of human savages, if travelers' tales are to be trusted.

To protect the young broods of pheasants, the gamekeepers wage unsparing war against the crows, which have consequently become exceedingly wary and good judges of the range of ordinary guns. Various stratagems are resorted to by the keepers, one of them being to erect shelters near the gathering places of the crows, from which to shoot them when they unwittingly approach. The crows suspiciously keep aloof except when they are sure of safety; but the