MODERN EGYPTIAN GARDENS.

Only those who have visited Egypt during the winter months can form any idea of the calm repose that almost invariably pervades that wonderful country at that period of the year. The clear blue sky and quiescent atmosphere cause such a dreaminess to overspread, as it were, the whole country, that, except near the cities, one may easily imagine one's self in a land of spectre palaces, villas, and mosques. The graceful heads of the date palm, poised calm and motionless in the air, relieve the towers of the country mansions of much of their monotony. It is winter, yet the orange trees are laden with golden fruit, t e jessamine, rose, and geranium are still in bloom. Theh leaves of the vine and other deciduous trees have just begun to turn red and brown, and to prepare to fall.

Our illustration, for which we are indebted to *The Garden*, is a good representation of a modern Egyptian villa and garden of the Mameluke period. The square basin and stately cypress, the vine-embowered path, producing shade and grapes in abundance, and the little summer house or kiosque in which the owner and his family enjoy the grateful weed and aromatic coffee, are faithful delineations of Egyptian garden life. During the past thirteen years, gardening has made rapid progress in Egypt, the frequent visits of the Pashas, princes, and Khedive to Europe having given the Egyptians of high rank quite a taste for European horticulture; and gardeners from England, France, and Italy have been employed in various localities, but more especially in the neighborhood of Cairo and Alexandria, to carry it out.

The Gezira garden is the best imitation of an English establishment in Egypt, and it has been created at an enormous expense. Embankments, artificial mounds, rock work, and water are all very naturally introduced; good breadths of lawn, dotted with trees, shrubs, and parterres of flowers, produce, in this land of sunshine, a more pleasing effect than in our own country, on account of the scarcity of grass in Egypt. To achieve this desideratum, large tanks or reservoirs have been constructed of sufficient hight to serve the fountains and to force water to every part of the garden, which, during summer, has to be kept in a state of perpetual irrigation. In the Gezira garden is a magnificent collection of tropical trees—palms of many kinds, ficus, cathartocarpus, musas, cycads, acacias and others too numerous to mention. Among the vast variety of climbing plants in this garden, the most notable is *bougainvillea spectabilis*, which grows with all the wild luxuriance of a wistara in our own country, and is annually covered with thousands of spikes of its lovely mauve colored bracts. In few countries is vegetation more rapid or luxuriant than in Egypt, if the irrigation is attended to; consequently it takes but a few years to have a perfect garden.

A MODERN EGYPTIAN VILLA AND GARDEN.

THE BOW AND STERN SCREW PROPELLER.

Mr. Robert Griffiths, of London, the well known screw propeller man, has lately made a discovery in the propulsion of vessels which, he thinks, is likely to effect a revolution in the economy of steam navigation. His plan is to inclose the propeller in tunnels, and to place one tunnel propeller in the bow and one in the stern. From practical trials made with small models, he concludes and asserts that he obtains an improvement equal to nearly 50 per cent in the speed of the vessel, without increasing the power. At a recent meeting of the Royal United Service Institution, Mr. Griffiths gave an interesting account of the progress of screw navigation, from which we select the following:

"It is generally admitted that barely 50 per cent of the power exerted by the engines is made available to propel the ship, by either screw, paddle wheels, or any other plan of propulsion which has yet been practically used, the other 50 per cent being lost in some way, to account for which there are a variety of opinions.

"I have for several years given up the idea that any further improvements were to be realized by any further change in the configuration of the screw propeller, and consequently turned my attention to the mode of applying it; my first patent in this direction, obtained in 1871, was for applying a screw at the bow of the ship within a tunnel in combination with the screw at the stern in the ordinary way; I afterwards found very great advantages in having both the bow and stern screws in tunnels, for which I obtained a patent in 1872. I was much surprised to find when I doubled the power by applying one portion to the bow screw and the other to the stern screw, each within a tunnel, the speed of the model increased nearly as the square root of the power, but if I doubled the power on either the bow or stern screws separately, the speed of the model in that case increased only as the cube root of the power. It is well known that the resistance to bodies propelled through the water varies as the square of the speed, while the power required is as the cube. At last it occurred to me that this great advantage must be due to the increased quantity of water that was passed through the screws within the tunnels, when both were at work, over what was due in the same time when only one screw propelled the model; for since one screw propelled the model from 58 feet to 60 feet in sixty seconds with 600 revolutions of the screw, and with the two screws of the same pitch together, from 96 to 100 feet in the same time and with the same number of revolutions, there must, therefore, be at least 50 per cent more water pass through the tunnels in the same time, and the thrust given to the screw shafts must be in proportion to the quantity of water acted upon by the screws.

"I had the mouth of the stern tunnel enlarged to the extent of 50 per cent, and this enlargement came below the keel. This it might be supposed would be an obstruction and cause a considerable loss of speed, but I was agreeably surprised to find when I tried it that I had a gain of 20 per cent in speed. I had found by my experiments that, as the supply of water to the screw is diminished, the power required to revolve it increases, and the speed of the ship diminishes.

"There are three important points to be considered in screw ships, namely, the propeller, the ship, and the engine. In the first there has been no improvements with regard to speed since 1840; secondly, with respect to the ships, the best types of ships were described by the old builders as having a cod's head and mackerel's tail, the length equal to three to four times her beam, and no better sea ships have been built than our sailing frigates of former days; but since the introduction of the screw the shipbuilder has been obliged to arrange his plans to suit the propeller, for experience has shown the deeper the immersion the more effective the propeller, and consequently steamships are now being made with an enormous draft of water in proportion to the beam. The eel might now be taken for the type of modern screw ships, which are made in length ten to fourteen times the beam; and had it not been for the introduction of iron for building ships, the screw would never have succeeded to the extent it has done. This great increase of length gives the shipbuilder no chance of improving the form of his ships, from a naval architectural point of view, which is not the case in my system, as whatever form or type the ship will be best for sailing will also be the best for the adoption of bow and stern screws.

"The great improvement in steamships during the last thirty years is to be found in the engines, from which about three times more indicated power is obtained now, with the same consumption of fuel than formerly, as well as other important improvements that have been made in this department.

"My attention was first drawn to the necessity of having bow and stern screws, on account of the danger attending the employment of ships of the enormous length in proportion to their beam; for every sailor must be well aware that, should an accident occur to the machinery in a heavy sea, or on a lee shore, there would be but a poor chance of saving the ship, especially if one of these long ships, with its machinery disabled, should get into a trough of the sea. I expected that the shipowners would have readily availed themselves of my arrangement on account of the safety it offered to the ship and passengers, and also that the Admiralty would have seen and promptly recognized the advantage and safety it would have been to the ships of war. Now that the high price of coal is being felt by the shipowners they may be induced to consider whether it will not be to their interest, as well as for the protection of their passengers, to