

white albatross has secured title to a large part of the island, while the black-footed albatross confines its home to the sand beaches. The blue-faced booby (*Sula cyanops*) confines itself to a narrow, littoral sedge-covered slope. In fact, every species has a definite district. Thus horizontally and perpendicularly, the birds of Laysan are distributed, the boundaries of their cramped nesting places being fixed as if by statute.

It was found that on this little island, crowded with birds, the white tern deposits its one egg in a shallow cavity on the edge of a shelf of a rock. It would seem that with all the bustling bird life these eggs would be brushed off and destroyed, but such was not the case, although some of the eggs were balanced at the very brink of little escarpments.

The naturalists paid special attention to the subterranean bird homes. Those tunneled by the white-breasted petrel (*Aestrelata hypoleuca*) are no less than six feet in length, and are crowded side by side. Those made by the wedge-tailed shearwater (*Puffinus cuneatus*) are frequently three feet long and often very much deeper.

The study of these excavated nesting places revealed the fact that they are very ancient. Year after year they have served as breeding homes for these birds. Laysan is in such demand as a bird home, that one species of migrants no sooner departs than another flock in to take its place, and the times of departure of one kind and the arrival of another are as precise as the movements of planets.

Although the apartment-like arrangement of nests enables the birds to make the best possible use of the island's area, Laysan would be utterly unable to contain all the birds that have chosen it as their breeding home if they arrived at the same time. "To find satisfactory places," said one of the scientists that explored the island, "the birds are obliged to take turns." Some species leave the place as soon as their young are strong enough to fly, and while they are in the act of departing, newcomers begin to arrive to take their places. "In this way," said the scientist, "a most definite succession, which probably dates back thousands of years, takes place year after year in the arrival and departure of certain species." Such is the law and custom in this bird Eden which, until now, so far as is known, has been uninvaded by man.

Whenever the naturalists fired a shot from a gun, thousands upon thousands of birds would suddenly fly about, crying out in a pandemonium of protest against the disturbance. Although the prevailing spirit of the teeming bird life is one of comity, there are some exceptions. A notable one is that which accompanies the arrival of the white-breasted petrel. These birds migrate by the thousand to Laysan, their habits on land being strictly nocturnal. Immediately upon their arrival they take possession of their ancestral catacombs, but not without quarrels and contests, and so rampant are these petrels, that milder species expediently move out of their way. The clamor of the petrels issues from under every bush and bunch of grass on the island. Even from under the sleeping place of the naturalists came the querulous notes.

The Hawaiian tern (*Micranus hawaiiensis*), a handsome little bird, lives exclusively on fish, yet it never dives for its food. It hovers over shoals of noi, and when one nears the surface, the tern swoops down and seizes it. Its fishing habits make this bird valuable to fishermen. It travels some distance to sea in search of its favorite diet. By following it, fishermen are enabled to locate the whereabouts of great schools of fish.

The white tern (*Gygis alba kittitzi*) has the curious habit of never bringing less than two fish at a time to its young. It carries the fish crosswise in its bill, and sometimes returns from its excursions with no less than four fish thus carried. It was easy enough to understand how it captured the first fish, but the naturalists were unable to comprehend how the bird managed to retain it while securing additional ones. Its ability to hold three fish in its bill and still capture a fourth was particularly puzzling. This bird is

strikingly beautiful, its plumage, with the exception of a black orbital ring, being pure white.

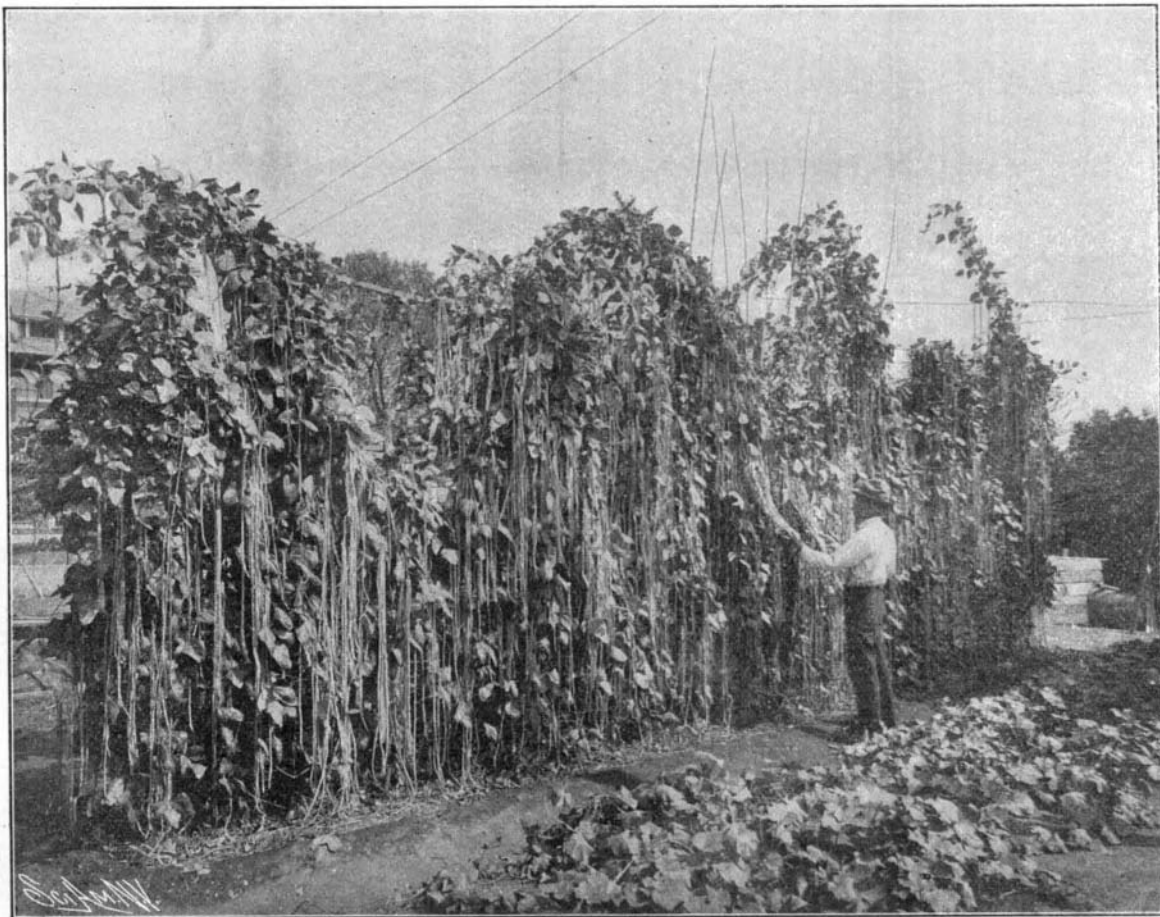
The expedition resulted in the discovery of a new species of tern, which Mr. Fisher has called *Procelsterna saxatilis* because it lays its eggs in hollows among the rocks. A peculiar species of teal was found on Laysan. Although ducks are regarded as the wildest kind of fowl, these Laysan teal would come up to where the naturalists stopped at nightfall, and would walk about like barnyard fowl.

Mr. Fisher has prepared for the government a fascinating account of the dance of the albatross, which he witnessed on Laysan. This account was published in the last number of the SCIENTIFIC AMERICAN, and need not here be repeated.

The island of Laysan, where these interesting observations of bird life were made, lies in latitude 25 deg. 42 min. south, and is 800 miles west of Honolulu. It is an old atoll, its highest point above the sea not exceeding 30 feet. It is but three miles long and one and one-half wide, and although it belongs to the United States, has escaped attention until now.

CALIFORNIA STRING BEANS.

The largest string beans in the world may be seen growing in the gardens of Charles Richardson, in Pasadena, Cal. They range from thirty to forty-three inches in length and average half an inch in width. They are not only enormously large but they make a delightful table delicacy when cut and stewed and prepared with cream and butter. The commercial



TEN THOUSAND YARDS OF BEANS ON A THIRTY-FOOT ROW.

gardener would find them a most profitable production, for the vines bear profusely and the beans are so large that one of them is more than a single person can comfortably manage.

These beans are of an aristocratic species and do not claim alliance with the common string bean. California botanists class them as belonging to the genus *Dolichos*, but owing to their great length they are more popularly known as "yard beans." The plants are natives of China and Japan and the seeds were sent to Mr. Richardson from Japan.

Early in the spring he planted them in a well-spaded, well-fertilized trench and put up a trellis seventeen feet in height to support the vines. The seeds sprouted quickly and the plants began to grow with a vengeance. They climbed to the tops of the poles and then turned around and began to grow backward. They are now twenty-five feet in length and are still growing. The row is thirty feet long, contains fifty vines and it has been estimated that the crop amounts to ten thousand yards of beans. The beans grow in clusters and can be easily and quickly gathered. The fragrant lavender blossoms resemble those of the sweet pea. They are peculiar in their habits, living but for a day, opening with the sun and dropping their petals when the sun goes down. The leaves are long and wide and grow in clusters of three. The vines are very clean and attractive and would be decidedly ornamental in any summer garden for either fence or trellis covering. The beans are best for eating when about twenty inches long. In flavor they excel that of the ordinary string bean.

Experiments on White Lead and Zinc Paints.

Apropos of the proposed substitution of paints having zinc white or other zinc compounds as a base, for white lead paints, M. J. Breton, a French scientist, has lately made a series of experiments upon the relative merits of different paints. He submitted a series of paints whose base was white lead or oxide of zinc to different actions and attacked them by strong reactive agents. From these experiments he brings out the following facts: White lead resists the action of certain acids better than its substitutes, but on the other hand it is quite inferior under the action of heat, of sudden changes of temperature, also of hydro-sulphurous emanations and certain strong oxidizing agents such as hypochlorite of soda. Besides, the white lead paints are much less adherent to the surfaces to which they are applied and have a marked tendency to blow up. The addition of sulphate of barium to white lead, while it diminishes its covering power considerably, does not seem to render the paint any less resistant. The addition of siccative to zinc oxide in the proportion needed to give these paints a drying quality which is equal to that of the white lead paints, does not diminish the resistance of the paint and appears on the contrary, at least in certain cases, to increase its solidity. The white lead forms a simple mixture with linseed oil, and not a combination, and the mixture is less homogeneous than that which is formed by oxide of zinc.

By a series of different methods which give very concordant results M. Breton compared the covering power of white lead and zinc oxide. He found that for an equal weight the spreading capacity of the zinc oxide is nearly double that of the white lead. For equal volumes, the covering power of zinc oxide is superior to that of the white lead, but as for equal quantities the first of these bodies forms a much less fluid mixture with the oil, it is necessary in practice to make the zinc paint thicker in order to obtain the same result. He shows that fresh white lead paint gives off emanations containing lead and which may in some cases bring about serious consequences to persons who are obliged to breathe them. This series of experiments forms a new argument in favor of substituting zinc for lead paints, which is so much to be desired from a hygienic standpoint, and presents so many advantages from a technical point of view.

Radium in America.

Prof. Alexander H. Phillips, of Princeton, is reported to have stated that radium exists in this country in carnotite, an ore from Utah. The professor

found on experimenting that from twenty-five pounds of carnotite a sample of radio-active barium chloride can be obtained, which will give about 1,500 activity. This activity, while not so powerful as that obtained from some European ores, is sufficient for many practical purposes. A company has been formed to place this new substance upon the market, and it is expected that it can be produced in paying quantities.

Carnotite, while not a very common ore, is found in good quantities in Utah, and very likely in other places in the Rocky Mountains.

Premiums for Improved Methods in Manufacturing Varnishes.

At the third general meeting of the Association of German Varnish Manufacturers recently held in Berlin, the board of directors was empowered to offer premiums or prizes of several thousand marks for methods of manufacturing varnishes which involve noteworthy improvements. As an important subject for consideration, a method for the deodorization of oil of turpentine is mentioned. The jury for awarding prizes consists of the board of directors and four other members. Communications are to be addressed to Mr. Louis Mann, commercial judge, Berlin, W. Meinecke Strasse 4.

Actinium is a metal whose radio-active properties rival those of radium. As yet little, if anything, has been done with the substance in this country. Dr. George F. Kunz, Tiffany's diamond expert, is the lucky recipient of a minute specimen, which is to be used for therapeutical purposes.