

HORTICULTURE

Vegetables Without Soil

Lettuce, cucumbers, green peppers, white radishes and tomatoes will constitute the regular crops of the hydroponic garden on rocky Ascension island.

By FRANK THONE

See Front Cover

► AFTER the war, Uncle Sam is going to find himself in possession of a whole flock of desert islands. He doesn't especially want them, but after dispossessing the Japs at high cost in American boys' lives he won't feel like throwing them away again.

Some of them will be valuable as naval and air bases, and as cable and radio centers, so at least small garrisons and technical operating forces will have to be maintained on them. Feeding these men is likely to be expensive, for most of these islands are actually desert: they consist either of bone-white coral sand or equally sterile lava and volcanic ash, with little or no soil suitable for gardening. Practically all provisions will have to be shipped in.

One means for relieving the monotony of a shipped-in diet for the forces stationed on these islands is now receiving its first large-scale try-out on the other side of the world. On Ascension island, a barren bit of rock that roosts almost on the equator midway between South America and Africa, the Air Quartermaster of the Army Air Forces has had set up a hydroponic garden, shown in the photograph on the front cover of this SCIENCE NEWS LETTER, that has begun to supply tomatoes, lettuce and other fresh salad vegetables for the garrison and transient flying personnel.

Heroic Undertaking

Attempting to grow green stuff on Ascension would seem at first glance to be almost as heroic an undertaking as gardening on the moon. Indeed, the island looks like a bit of the moon's surface, as depicted by astronomer-artists: its 35 square miles are simply a series of dead volcanic cones and narrow, cinder-choked valleys. A general idea of what the island is like can be gathered from the background of the cover picture.

Except for one green patch on top of the highest peak, that sticks up into the cloud level, the island gets almost no rain. The natural vegetation consists

of scattered clumps of cactus, sparse dried-out grasses, and a white-washing of lichens on the rocks. It is altogether a Dantesque landscape—a lost world almost without any life of its own.

Forbidding as it is, this isolated little world has been the scene of some of the most intense activity of the whole war. Bombers and transport planes whose war-cargoes helped to save North Africa from Rommel stopped here to refuel; fighters en route to India and China still touch down here in great numbers. When the first crop was gathered permanent garrison and transient personnel together numbered about 2,000; the number of course is always fluctuating; there is also a small civilian population that takes care of the highly important cable station which the British have long maintained on Ascension.

Here as everywhere else, water is the key to life. Every drop of water that all the fighting forces here use for all purposes has to be distilled from the undrinkable brine of the ocean. Army Engineers

have set up an oil-fueled distilling plant that is a marvel of efficiency under the circumstances; it produces about 30,000 gallons of good fresh water every 24 hours.

This distilled water is what has made it possible for the military Robinson Crusoes on this desert island to satisfy their natural craving for something green, to supplement what comes out of the shipped-in boxes and cans and bags.

From now on as long as needed, everybody on the island can have lettuce at least twice a week, with cucumbers and green peppers to make the salad more tasty. There will be hot-flavored white radishes once a week. Tomatoes start out on a twice-a-week basis also, but when the vines reach full bearing there should be tomatoes every day.

Five Regular Crops

These five vegetables will constitute the regular crops of the hydroponic garden. Under the limitations imposed by space and working force available, it is considered best not to attempt growing vegetables that require cooking.

The hydroponic system used on Ascension is the one in which the plants are rooted in beds of sterile gravel, which



LETTUCE FOR SALADS—Lettuce is harvested leaf by leaf, letting the stalks stand to start producing again. In this way four crops can be harvested from the same plants, before re-setting becomes necessary.



NOT PRIZES—Kendrick Blodgett, who runs the hydroponic garden, looks pleased over some of his cucumbers. These aren't prize specimens—just "run o' the crop."

are irrigated every two days with water containing the essential mineral fertilizer elements in solution. After the trough-like beds have been flooded with 7,000 or 8,000 gallons of water, as much as will drain off is permitted to flow into a sump, where it is held for re-use at the next irrigation. About 70 per cent of the water used is recovered in this way.

Each bed is a long, narrow trough sliced out of the lava soil, three feet wide and 400 feet in over-all length, but divided into four descending steps to make drainage better. The beds are made waterproof with asphaltic concrete, lined with a non-toxic asphalt paint. There are 25 of them altogether, with gravel walkways between for the convenience of the working force, giving a total crop-raising surface of 30,000 square feet.

Protected From Sun

The whole installation, covering a space as big as a large city square, is partially roofed with white cloth supported on wire, like a Connecticut tobacco field; the strips are arranged to give protection from the noon sun to part of the beds, but over some of them, especially the cucumbers, the covering is complete. There are also windbreak-fences around the sides, to check the drying sweep of the southeast trade winds that blow endlessly over the island.

Some interesting problems have been encountered in connection with this soilless garden on a desert island. Cucumbers and green peppers need bees for

pollination, and there were no bees on Ascension. So a hive of them was brought, by plane, from Brazil, 1400-odd miles away.

Tomatoes are normally able to pollinate themselves, but for some reason the pollen they produced here was scanty and not very good. So each flower gets a squirt of a growth-promoting substance, or plant hormone, which induces the formation of seedless fruit. Ascension tomatoes, being partially pollinated, do have seeds, but very few of them.

Lettuce is harvested here leaf by leaf, so that the stalk may be left standing to produce a new crop. Each stalk will yield four pluckings of leaves before it needs to be pulled up and replaced with a new plant.

Civilian in Charge

The whole hydroponic project on Ascension has from the outset been in charge of a civilian employe of the Army, an Indiana horticulturist named Kendrick Blodgett, who had already scored considerable success in raising vegetables under tropical conditions. As his chief aid he has Lieut. John S. Fisher, who in civil life was an entomologist. He recruited a force of ten non-commissioned officers to help him, by having the entire Air Forces screened for young men who had attended agricultural colleges. These are the men who will aid him in carrying the soilless gardening method to other islands. Seven more enlisted men, who had been farm boys before the war, were added to the working force out of ground personnel on the island itself.

One of Mr. Blodgett's eleven disciples had already had experience in hydroponic gardening; he raised flowers by that method in his own greenhouse in Philadelphia. Sgt. William Brientnall is a graduate of Pennsylvania State College. He has been put in charge of the propagation house, where all plants except radishes are started; as his aide he has Sgt. William Buckley, a California Agricultural College graduate.

Already first moves have been made toward the spread of these soilless gardens to other desert islands that are key points in our transoceanic airways network. A small installation has been set up on Christmas island, just north of the equator and almost due south of Honolulu.

Johnson Island Next

Next on the list is Johnson island, another coral patch a long airplane hop to the southwest of the Hawaiian center. Mr. Blodgett says that area commanders

are asking for his gardens faster than he can get them set up, even with the aid of his devoted eleven. It looks as if hydroponics has a promising future in making the desert blossom, if not like the rose, at least like cucumbers and tomatoes.

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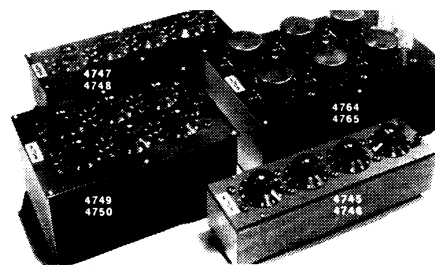
CHEMISTRY

Vitamin Discoverer Rescued From Nazis

► ONE of the men who discovered the chemical identity of vitamin C, Prof. Albert Szent-Gyorgyi of Budapest, was rescued from the Nazis and is now safe in Moscow. News of his safe arrival there comes from his colleague, Prof. Hugo Theorell in Stockholm.

The Swedish Legation in Budapest managed to save the Hungarian Nobel Prize Winner by employing him as chauffeur. A package of manuscripts covering his latest research has also been saved and is now being printed in Stockholm with funds from the Nobel Foundation. The manuscripts were smuggled from Budapest last November with Swedish help.

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