MILITARY STRATEGY

Radar Planes Guard Our Pacific Flank

See Front Cover

➤ BESIDES EARLY warning radar networks, the United States is using airplanes to guard both its Pacific and Atlantic coasts as one element in its warning and interception systems.

Shown on the cover of this week's SCIENCE NEWS LETTER is a U. S. Navy early-warning Lockheed Super Constellation on such patrol duty.

The "shark fin's" hump and mushroom-shaped bottom bubble house the radar antenna that can pinpoint strange aircraft and ships. Heart of the flying ship is the combat information center from which especially trained Navy crews can detect intruders with their electronic instruments, and from which air fleet interception can be directed.

Announcement was made in September of a new element, the fourth in the complex warning and interception plan to guard the U. S. from attack.

It is DEW, for "distant early warning," a radar net across the Arctic wastelands of northern Canada and Alaska. Unofficial estimates are that it will cost $1,000,000,000 to complete. It is intended to signal automatically the approach of enemy bombers over the polar regions several hours before they could reach target cities in this country.

The other two elements of the warning system are the Pinetree network along the Canadian-American border, which consists of radar warning systems and devices for controlling fighter-interceptors, and the mid-Canada line, north of the settled areas of Canada, which consists of warning devices designed at McGill University, Montreal.

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BOTANY

NATURE RAMBLINGS

Ferns

➤ LATE AUTUMN is a good time to pay attention to the ferns. We are kept pretty busy on our woodland rambles in spring and summer, and even during early autumn, trying to hold ourselves abreast of the rapid procession of blossoming things.

However, when frosts have laid waste the petals and crippled the insects that make them worth producing, then we can turn our attention to the lesser but older relatives of the flowering plants, now consigned to back seats by the hustling later plants.

The patient ferns have for the most part waited for us, too. Ferns do not shed their leaves as broad-leaved trees and bushes do. While some of them, like the maiden-hair and the bladderwort, may have withered and curled beyond the possibility of examination, there are very many species that are true evergreens, holding up their tough, strong little leaf-blades dark green and alive even when buried deep in snow.

And there are others, like the royal fern and the spleen wort, that keep green in defiance of frost until really heavy cold weather strikes them, and then, though brown and dead, still hold their shapes well enough to be worth study.

Even when the vegetative leaves have all been struck down, there still remain those odd structures which many ferns produce—pre-Cretaceous analogues of flowers. "Fertile fronds," botanists call them; they bear clouds of spores that fly out like brown dust when you brush against them.

You will find these among the sensitive ferns and cinnamon ferns. Others, like the Christmas fern, fashion their fertile fronds like the non-sporulating sterile ones, except that on the backs of the leaflets—perhaps only the leaflets near the tip—we find the little brown dots where the spores are borne.

The ferns that we select for decoration are usually the sterile fronds, for the fertile ones are not so graceful, and many uninformed people think that the brown spore cases are a fungus.

The Christmas fern, being very firm in texture, is much used in holiday decoration, from whence comes its common name, much easier to remember than Polystichum acrostichoides, its real name. It grows best in well-shaded woodlands, preferring a spot near trees that shed their leaves rather than near evergreens. Indeed, full sunshine has been known to kill this plant.

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ENGINEERING

Auto Safety Belt

➤ AUTOMOBILE SAFETY belts have been recommended as a means of substantially reducing the nation's huge traffic death and injury toll, but experts warn that use of inferior belts may jeopardize the entire program.

Edward R. Dye, head of the Cornell Aeronautical Laboratory Industrial Division, heartily endorses the use of seat belts, but urges these check points for prospective buyers:

The so-called "loop strength" of the seat belt and buckle should be not less than 3,000 pounds. This belt would support a 200 pound man in a crash of 15g deceleration, a crash in which the belt would have to withstand a load 15 times the man's weight. A 15g deceleration is probably tops for a severe head-on crash.

The belt should be not less than two inches wide.

Only one person should use each belt.

The belt should be anchored in a manner to transmit the full force of the belt's 3,000 pounds loop strength to the frame of the car.

The belt from car attachment point to hips should cross the pelvic region at an angle of approximately 45 degrees.

The belt should be worn with not more than four inches slack.

Mr. Dye considers these rules minimum requirements based on several years of automobile crash safety research at the Laboratory. His own automobile is equipped with safety belts for driver and passengers.

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