

must be used for best effect; neither produces full results if used alone.

Experimental work on the new spray was carried on at the Inter-American Institute of Agricultural Sciences in Costa Rica, under the direction of Robert L. Squibb. The spraying has to be done carefully, to make sure that the droplets reach every skin fold where ticks might hide. When this is done, however, the

method seems to be fully as effective as tank dipping, the method hitherto in partial use in tropical American countries. It offers the considerable advantage over dipping that it can be used by any farmer on his home place, and does not involve driving the cattle to the tanks, which are often at quite inconvenient distances.

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forward bulkhead. They are entirely self-operative, and are actuated from regular static lines to the standard Kollsman altimeter and airspeed indicator located in front of the pilots on the instrument board.

The cabin control regulator is a fully automatic precision instrument that is set prior to flight. As the Constellation becomes airborne, the regulator begins to function and continually maintains the necessary pressure differential between the cabin and the outside at any altitude, and controls the air temperature. It relieves flight personnel of the duty of adjusting the pressure and temperature as altitude changes.

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MARINE BIOLOGY

A-Bomb Versus Fish

Results of test at Bikini atoll on fish and other animal and plant life will be investigated by biologists. Effects on fish considered most important.

► WHEN THE ATOM bombs burst over Bikini atoll in the forthcoming experimental explosions they will undoubtedly kill a lot of fish, and may do a good deal of damage to the trees and bushes on shore, and to the birds and other land animals that live among them. How extensive the damage, and how long it takes wildlife to return to a normal state afterwards, will be determined by precise and long-continued surveys that will be carried on by a group of research biologists. Plans for the study of these "bioatomic" effects are now being carefully formulated.

Effects on fish are considered most important. Elmer Higgins, chief fishery biologist of the U. S. Fish and Wildlife Service in Washington, D. C., is acting as liaison officer with the joint Army-Navy group that will conduct the bombing tests. He has designated three marine biologists chosen from the staffs of the Fish and Wildlife Service and the U. S. National Museum, who will concentrate on this one phase of the general problem. They will study the effects, both immediate and long-time, on three ecological groups of fish: inshore, off-shore in the lagoon, and offshore in the open ocean.

A careful survey will be made of fish life in the area before the explosions, and at intervals for many months afterwards, to give as complete and continuous a picture as possible. A corps of expert fishermen is being recruited, to serve as assistants to the three biologists. The Navy will land small craft for use in this work, and also seaplanes for scouting schools of fish.

Although fish occupy the No. 1 position in the biological planning, they are by no means the whole story. Biological

specialists from several institutions will carry on studies on the plankton, or microscopic plant and animal life that is the ultimate source of all sea food, on the biology and geology of the coral reefs that build all atolls, on the beach and land animals, and on both marine and land plants.

Early objections to the bombing experiments, on the score of possible material harm to commercial fisheries and the whaling industry, have been overcome by the selection of Bikini atoll as the site. The fish here, though abundant enough, are too far from any possible market to be of economic significance, and the little island circle is remote from all known paths of whale migration.

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AERONAUTICS

Speed and Altitude of Plane Constantly Shown

► HOW HIGH in the air and how fast the plane is travelling will be known at all times by passengers in new giant Lockheed Constellations. Large flight instruments, placed where all may see, will give them the same information that only crew members in the pilot compartment now have. While their natural curiosity is thus being satisfied, their bodily comfort will be aided by a new automatic device that will control cabin temperature, ventilation and pressure.

Both the altitude-speed instrument and the cabin regulator are products of the Kollsman Instrument Division of Square D Company.

The two flight instruments are large and easily read, and are placed on the

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