ORNITHOLOGY

Albatross "Beats the Heat"

➤ STUDIES of "how to beat the heat" have been aided by the albatross, the good luck symbol of ancient mariners and the "gooney bird" of the Pacific.

Drs. Thomas R. Howell and George A. Bartholomew, University of California, Los Angeles, zoologists, have made a special study of the big birds on Midway Island in the Pacific. These albatrosses are extremely tame and make good scientific subjects, they report.

The UCLA scientists have investigated how albatrosses and their young survive the extreme temperatures of their desert island sanctuaries. They have found that the birds lay their eggs (one to a nest), hatch them and rear the infant birds during Midway's mild season before the intense summer heat sets in.

The young albatrosses are equipped with a number of mechanisms for adapting to heat as the summer approaches. One such mechanism is in the webbing of their feet. This relatively thin membrane contains a large number of tiny blood vessels from which heat in the blood can be dissipated.

The birds sit on their heels with their webbed toes in the air (to keep the webbing off the hot sand) and shade their feet with their bodies to make the most effective use of this heat-dissipating mechanism.

The young get their water from squid fed to them by their parents. The water from the squid is quite salty, but the birds have an unusual mechanism in their nostrils for excreting salt. Adequate water is thus made available for evaporative cooling of the body.

The adult birds drink sea water most of the time. They have been observed to peck at raindrops while nesting. They may obtain some water in this manner while brooding since they refuse to leave the nest for the sea during this period.

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TECHNOLOGY

Aid New Nations' Needs

➤ COMPETENCE SHOWN by the United States in developing new technologies for space conquest should be applied to helping the world's underdeveloped areas as well.

But each step in a development program should be geared specifically to actual conditions and needs of developing economies now emerging from traditional societies. In early stages, "power dams and steel mills" place too large a burden on low-level economic conditions and limited skills.

This approach to U.S. assistance for young nations comes from Jack Baranson, research associate with the Committee for Economic Development in Washington, D.C. He suggests how several technological innovations might be "tailored to national levels and aspirations."

New products, such as high-protein flours made from fish, could help solve critical food supply problems.

New industrial processes could give developing economies "competitive advantage in selective markets"—for example, producing reinforced plastic to replace steel as a structural material.

Many developing areas, Mr. Baranson points out, are just as cut off from "civilization" as orbiting satellites. They need self-sustaining, long-life products and equipment. New systems and designs also would foster local pride and prestige—"no small factor in emerging nationalism."

Technicians responsible for solar batteries in space satellites might apply their ingenuity to developing low-kilowatt generators for small-scale industries in remote villages. A thermoelectric coupling could be used, for example, to convert heat from kerosene lamps into electricity.

Low-cost nylon bearings, requiring no lubrication, could be installed on ox carts and other simple vehicles.

Communications satellite systems offer possibilities for educating "vast numbers of illiterates in remote regions." World-wide TV channels could furnish developing areas with latest medical techniques or agricultural and industrial extension services.

Mr. Baranson suggests allowing private firms to bid on research contracts "just as aerospace firms do for the National Aeronautics and Space Administration." In time, some firms would be familiar enough with situations in particular countries to specialize in their technological development. And the funds provided to create new technologies would greatly increase the individual country's own ability to produce needed food and materials.

Each country's "deep-rooted cultural and psychological affinities" should be considered, he said. National tastes may overshadow economic necessity. In certain Asian countries, for example, people were so accustomed to eating rice that it was necessary "to simulate the taste, texture, and even the shape of rice grains" in order to make wheat flour acceptable.

As used in existing foreign aid programs, advanced technologies have only made the gap separating have and have-not nations more obvious, rather than narrowing it, Mr. Baranson believes.

A revised program "compatible with the interests and yearnings of new nations" would provide bold, imaginative help for emerging nations in Africa, Asia and Latin America, he said.

A preliminary statement on Mr. Baranson's report appears in the Harvard Business Review (July-Aug.).

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METALLURGY

Supersonic Wet "Bullets" Fired Into Thick Metals

➤ RESEARCHERS are firing "bullets" of water into metal targets at supersonic speeds to study the erosive action of water droplets, an American Society of Testing Materials symposium learned in Atlantic City, N. J.

Water jets, traveling at velocities up to 3,400 miles an hour are released when a lead pellet is fired by compressed air into a small sealed reservoir. The jet then strikes the test metal. It can leave a sizable dent in thick slabs of copper and stainless steel.

S. M. DeCorso and R. E. Kothmann of the Westinghouse Electric Corporation's research laboratories, Pittsburgh, Pa., said the tests are aimed at finding ways to prevent erosion in turbine blades from water drops in moist steam. Similar erosion affects airplane and missile surfaces when they hit raindrops during high-speed flights.

Stellite (a cobalt alloy) and tungsten carbide have shown the greatest resistance to water bombardment in metals tested to date, they reported.

A side effect of their scientific shooting expedition has yet to be explained. Photographs show that a burst of light, lasting less than one-millionth of a second, is given off by the water as it crashes into metal. No one knows why.

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POWER FROM SUN—The Somor concentrator, adapted for solar cells in satellites, is expected to increase the amount of electricity from sunlight by 45%. Researchers of the Boeing Company, Seattle, Wash., produced intensity of more than 100 watts a square foot in studies made on the haze-free slopes of Mt. Rainier, Washington.