

in Honolulu, is effective except when sharks enter into a "feeding frenzy."

Although sharks can readily distinguish an object against a contrasting background in either bright or dim light, they can neither clearly discern the details of the object nor its color, Dr. Gilbert explained.

In experiments sharks had their vision interrupted by black plastic shields over each eye, and their ability to smell was obliterated temporarily by plugging each olfactory sac with cotton soaked in an anesthetic, pontocaine. At distances greater

than 100 feet, smell is more important than vision in guiding sharks to prey.

At distances of 100 feet or less, depending on the clarity of the water and amount of light, vision increases in importance. At very close range of ten feet or less, vision is probably the principal sense involved in directing a shark to its target. When both vision and olfaction are obliterated simultaneously, an adult Negapriion swims helplessly about, injures itself seriously, and dies within three to five days.

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ENTOMOLOGY

Insects Fight Insects

► INSECTS are fighting insects at man's instigation in 221 cases throughout the world in about 65 countries.

Dr. Paul DeBach of the University of California, Riverside, told the Tenth Pacific Science Congress in Honolulu that there are 123 more or less successful cases of biological control of insect pests by natural enemies imported into 23 areas in the Pacific. This setting of insect against insect has made it possible to continue to grow major crops over extensive areas that otherwise would have been deprived of important agricultural production.

Entomologists seek out the natural insect enemies of other insects in various parts of the world and then propagate them in areas where it is desired to control the destructive insect. In many cases it has been possible to bring about bio-

logical control by means of insects without resorting to costly insecticides.

Dr. DeBach, analyzing the 123 cases of biological control of test insects in the Pacific areas, found that 65 of these were effective on islands and 58 on continents. Some of the natural enemies of insects put to work on control in other than their native areas are parasites, some are predators, others use a combination of both. The parasites outnumber the predators.

More research and importation of insects for biological control was urged by Dr. DeBach since he says that the number of successes obtained is proportional to the effort that is made in this way. He urged the scientists at this Pacific Science Congress to emphasize biological control efforts just as similar congresses did in 1924 and 1939.

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ARCHAEOLOGY

Pacific Peopled Earlier

► THE PACIFIC ISLANDS were peopled several hundred years earlier than previously believed. This was revealed by radiocarbon dating determinations reported to the Tenth Pacific Science Congress in Honolulu by Dr. Richard Shutler Jr., archaeologist at the Nevada State Museum, Carson City, Nev.

More than 100 specimens from various parts of the Pacific area were dated by measuring the present radioactivity of carbon isotope-14 in them and thus determining their age.

The inhabitants of the south China Coast had seagoing vessels by 2000 B.C. From this area the ancestors of the future occupants of the Pacific left, following at least two routes: Through the Philippines into Micronesia, and through Indonesia into Melanesia. Long human occupation in the East Indies is indicated by a radiocarbon date of 39,000 years from the Niah Caves, Sarawak. The wanderers arrived in the Marianas Islands by 1500 B.C., and Yap by A.D. 178. Those who took the Melanesian route arrived at New Caledonia by 800 B.C., and Fiji by 46 B.C.

Samoa was occupied by A.D. 9, Easter Island by A.D. 400, Marquesas by 122 B.C., New Zealand by A.D. 1000, and Hawaii by

A.D. 124. The dates are fairly consistent with the "line of march," and are not out of line with the distribution of adzes and linguistic evidence.

Dr. Shutler stated "that a major contribution of radiocarbon dating to Pacific archaeology has been to show that the early conceptions of the time of migrations into this area were wrong by several hundred years, being much earlier than anticipated."

Cosmic radiation bombarding nitrogen in the earth's upper atmosphere continually creates radioactive carbon of atomic weight 14 which is washed by rains to earth and accumulates in all living things. The rate of radioactivity, which decreases with time, tells the age of once-living objects.

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Personality and Society

► THE WAY children are reared in a certain kind of civilization may affect their personalities and even diseases they will have in later life.

As a part of a world-wide investigation by medical scientists, anthropologists and other experts, the Tenth Pacific Science Congress in Honolulu heard reports of effects of culture in Okinawa on personality.

Okinawa in the Ryukyu Islands near Japan is one of the areas in which a long-continued study is underway. The other regions are New England, India, Mexico, the Philippines and Tegusa in Africa. This research is under the direction of the Harvard Graduate School of Education.

In such inquiries, for example, it is found that under polygamy the mother plays a dominant role and the child may not see his father for years. The experience of breaking away from the family in such a culture is different from that experienced by a child in a culture where monogamy is the custom and the father and his influence are present.

Even the form of government and the educational system have been found to affect the lives of people under various cultures.

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