LETTERS TO THE EDITORS

BIOLOGY

Fluorescence Effects from Corals irradiated with Ultra-Violet Rays

IN January 1957, three months after the official inauguration of the Aquarium of Nouméa which my wife and I established in New Caledonia, we obtained the first effects of fluorescence through irradiation with ultra-violet rays of deep-water corals. The different specimens treated had been collected in the lagoon at a depth of 35–40 m., about twenty miles from our station where they are kept alive.

The first corals on which we experimented belonged mainly to the genus *Flabellum*, with which we obtained green fluorescence of great intensity. (There is no doubt that it is fluorescence, as the phenomena stop as soon as the excitation ceases. In other words, there is in these corals no residual photoluminescence, which becomes apparent as soon as the irradiation ends.) Since then, all specimens of corals, collected in the same region and elsewhere from varying depths, have been systematically exposed to treatment with ultra-violet radiation.

Our preliminary observations are as follows: (1) Only a certain number of species respond to irradiation. (2) All individuals belonging to the same genus produce generally the same colour of fluorescence (thus the *Flabellum* show greens, the *Trachyphyllia* oranges, etc.). However, certain genera may present several colours in the same individual. In that case a particular colour is always localized in the same region on each organism. (3) Colours and frequency-range are, at present: green, varying from light to dark, and at times with a glow; orange, varying from light to dark and at times with a brilliant glow; silver blue (very small range); reddish (either dull or shiny); beige (very small range); brown (very small range); and grey (sometimes silvery).

The definite green colour of certain corals may sometimes change to pink either after frequent or too lengthy exposures to irradiation or perhaps from other causes. (4) Only the fleshy parts of corals are fluorescent; the skeleton itself never reacts. (5) The expansion of polyps of certain species, especially those which expand normally in day-time, is greatly excited by ultra-violet irradiation, while species which expand at night do not react positively. (6) Most corals exposed to ultra-violet irradiation suffer from this treatment. In certain cases it may be fatal if the experiment is repeated too often or if it is of too long duration. Generally speaking, the intensity of fluorescence decreases day after day in proportion with the decreased vitality of the subject treated.

Other organisms collected from a depth of 35–40 m., particularly anemones and calcareous algae, show fluorescence, but its intensity is much less than that observed with corals.

Apart from the exceptional beauty of the fluorescent corals, the phenomena suggest research in different fields such as chemistry, physics and biology. Finally, this fluorescence might be a new approach to the systematic study of these corals. In fact, certain specimens which seem *a priori* to belong to the same species react to ultra-violet irradiation with quite different colours.

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Lumpy Skin Disease of Cattle in Kenya

LUMPY skin is an infectious disease of cattle characterized by the eruption of cutaneous nodules on any part of the body together with generalized lymphadenitis. It has been known for some time in several African territories, including Northern Rhodesia (1929)[1,2], Bechuanaland (1943)[3], the Union of South Africa (1944)[4], Southern Rhodesia (1945)[5], Mozambique (1946)[6], Swaziland (1946)[7], Basutoland (1947)[7], Madagascar (1954)[8] and Belgian Congo (1955)[9]. The dates of first confirmation in these countries are in parentheses.

To the above list must now be added Kenya, where the disease was recognized for the first time towards the end of 1957 on a farm in the Nakuru area. The source of infection in this outbreak is unknown. The disease was confined to calves, some of which were severely affected. The natural mortality was very low, and all active cases were slaughtered. After confirmation of the initial outbreak, field staff of the Veterinary Department carried out an extensive and systematic search for further cases of the disease over a wide area of the surrounding districts. Only a few active cases were found on widely separated farms. These were generally mild in character, and involved, as a rule, only one or two animals in each herd. Over the past year lumpy skin disease has spread slowly and sporadically despite the enforcement of stringent quarantine restrictions and sanitary arrangements. Cattle on recently affected farms in the vicinity of Lakes Nakuru and Elmenteita, however, have shown a higher morbidity, and individual cases have been more severe.

In Kenya, as in other affected territories, the spread of the disease has been unaccountable. Outbreaks have occurred in herds several miles apart with no evidence of infection on neighbouring or intervening farms. There was severe infestation by mosquitoes on the first farm where the disease was diagnosed. Infestations of varying severity have also been reported on 54 out of 56 farms afterwards infected by lumpy skin disease. The possible role of mosquitoes as vectors of the disease is under investigation.

In the more severe cases in Kenya nodules have been found not only in the skin but also in the internal organs, for example, oral cavity, pharynx, larynx, trachea, lungs, liver and proventriculi. Histological examination of skin and other lesions has revealed the presence of intracytoplasmic inclusions in a large proportion of cases in the epithelial and infiltrating mononuclear cells similar to those first described by Thomas and Mare[4].

Alexander *et al.*[10] have isolated three types of infective agents from cases of lumpy skin disease. One of these, their group II, produces a generalized