dismissed by the statement that they are "so widely opposed to geographical distribution as scarcely to merit serious consideration". The history of zoology is full of inconvenient records and, although I am fully prepared to admit the improbability of the present ones, I also hold that they cannot simply be ignored as contrary to theory.

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Darwin's *Cavernularia*

SOME years ago, I discovered in the cellars of the Cambridge Museum of Zoology a specimen of the sea-pen *Cavernularia* with the label "Voyage of the *Beagle*. C. Darwin. Galapagos Is." I described[1] it briefly under the name *Cavernularia darwinii*.

A point of special interest about this specimen is that there was no record, at that time, of any species of *Cavernularia* or of the closely related genus *Veretillum* found on the eastern side of the Pacific Ocean.

Quite recently, Miss Elisabeth Deichmann[2] has described a species under the name *Veretillum binghami* from the Gulf of Lower California, which I feel sure is identical with the *Cavernularia darwinii* of the Galapagos Islands. It may be sufficiently distinct to be called a variety of that species (such as *Cavernularia darwinii* var. *binghami*), but the essential point is that it is now known that these Pennatulids do occur, and apparently in large numbers, on the coast of Lower California.

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[1] *Proc. Camb. Phil. Soc.*, **20**, 3 (1921).
[2] Bull. Bingham Oceanogr. Coll., Yale, **5**, 3 (1936).

A Colour Reaction for the Detection and Determination of Vitamin D

OUR endeavour to find a chemical method for determining vitamin D in the presence of ergosterol and other sterols led to a colour reaction specific for vitamin D—in so far as this reaction is not given by ergosterol and its irradiation products.

The test is carried out in the following way: the solution of sterols (dissolved in benzene, petroleum ether or chloroform) is evaporated in a test-tube to about one quarter of a cubic centimetre and 5–10 drops of a 0·1 per cent solution of pyrogallol in absolute alcohol are added. After heating on a water bath, 2–4 drops of a freshly prepared 10 per cent solution of dry aluminium chloride (sublimed, "pro synthesi") in absolute alcohol are added and the heating is continued. If vitamin D is present, a deep violet colour appears at the bottom of the test-tube, reaching its maximal intensity about four minutes after heating started. For the subsequent colorimetric determination, the product of the reaction is immediately dissolved in absolute alcohol (lilac-red coloured solution), and a current of dry carbon dioxide is blown over the surface in order to prevent further oxidation; the test-tube is then closed with a rubber stopper.

Under these conditions, cholesterol, ergosterol, lumisterol give no colour reaction; suprasterol II (A. Windaus), however, in the same concentration as vitamin D, gives a fainter tint[1]. Fatty or oily solutions of vitamin D must first be carefully saponified; the solvent is then evaporated *in vacuo* and the reaction can be carried out with the petroleum ether extract. This extract must be absolutely dry (use anhydrous sodium sulphate) and free from any fatty substances. Solvents other than petroleum ether, benzene, chloroform or absolute alcohol must be eliminated by distillation before starting the reaction. Since prolonged heating of a solution of pyrogallol and aluminium chloride in absolute alcohol gives rise to a faint pink colour, the addition of alcohol must be avoided before the reaction has taken place.

The quantitative determination can be easily carried out by means of an ordinary colorimeter[1] or a Zeiss-Pulfrich-Stufenphotometer. The reading can be made within an hour after the test. During this time the colour does not change markedly provided the above-mentioned procedure is followed carefully. So far we have analysed three specimens of pure vitamin D (calciferol) and obtained uniform results. Commercial samples of vitamin D in natural oils, as well as solutions of weighed amounts of calciferol in olive oil, have also been tested: the results were in accordance with the indicated strengths and the theoretical values, respectively. The smallest detectable amount is about 0·002 mgm. of vitamin D. The optimal quantity for the colorimetric determination has been found to be within the limits of 0·01–0·1 mgm. The detection of vitamin D in mixtures containing vitamin A and related products (for example, cod liver oil) can only be carried out after removal of all other substances which give a colour reaction with the above mentioned reagents[2].

We are greatly indebted to Sir Henry Dale for the interest which he has taken in our work and for providing us with a sample of calciferol. We should like also to express our sincere gratitude for the help given us by the Glaxo Laboratories Ltd., which furnished us with samples of calciferol and lumisterol.

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[1] A communication on the colorimetric method will be published in a separate paper by Mrs. Hariklia Tzoni.
[2] The results of our work on this subject will be published later in a separate paper.

X-Ray Study of Myosin

IN a recent paper[1] the following passages occur: "Astbury finds that certain changes occur when wool is treated with steam. When myosin is exposed to steam similar changes are detected (*sic*). Astbury and Dickinson suggest that the myosin in muscle undergoes this change in the course of muscular activity": and "The change in myosin known to occur when muscle becomes active is therefore distinctly different from the change that Astbury and Dickinson suppose takes place".

We should like to point out that we have never expressed such an opinion, as readers of NATURE may readily verify for themselves by referring to our communication[2]. At the moment, we are concerned in trying to establish what appears to be a remarkably close analogy between the X-ray and elastic properties of myosin and the supercontracting form of keratin; but as for what chemical changes are involved in muscle itself in bringing about the