dextrose–peptone medium and those (about 10 per cent) which produced melanin pigment[6] were tested serologically. In this way we were able to select two isolates as probable pathogens. Pathogenicity tests on potato afterwards showed them to be *S. scabies*. It appears that serology can be used to screen *Streptomyces* spp. isolated from soil or potato tubers and to single out those most likely to be *S. scabies*, thus reducing time and space-consuming greenhouse testing.

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Dating of Tropical Coastal Regression

It is generally supposed that the coast-line of tropical Africa is regressing. The process of coastal regression, and its effect on the lagoon system of the immediate hinterland, have already been discussed and illustrated[1]. From this work it would appear that an absolute estimate of the rate of coastal regression can be obtained by dating the remains of the salt lagoon mangrove vegetation which has been overwhelmed by the coastal sandbar in its retreat, and has since, with continuing landward movement of the bar, re-emerged on the inter-tidal zone of the shore.

In September 1960, the lower portion of a stem and the main roots of a mangrove, identified as *Rhizophora mucronata* Lam., were removed from the surface layers of inter-tidal sand from which it was protruding on Estoril Beach, some four miles east of Beira in Mozambique. Radiocarbon dating of this material, undertaken in the Gulbenkian Laboratory of this College by Dr. E. R. Swart, showed its age to be 560 ± 100 years B.P.

The section of coast behind the shore where this dated material was found is at present occupied by a fresh-water lagoon. Sea-water occasionally penetrates into the lagoon when high-storm waves mount the protecting sand bar, killing the plants of the contact area of fresh-water swamp. It might be presumed, therefore, that in this section of coast a new cycle with a mangrove-fringed salt lagoon is about to commence, when sea-water regularly, instead of occasionally, will enter the lagoon.

The whole geomorphological cycle here, from the creation of one salt lagoon to the next, must therefore last at least 560 ± 100 years.

Taking as one mile the average width back from the sea of a salt lagoon, this would give an average minimum regression rate in this area of some three yards a year. If the present Quaternary climatic cycle is taken as beginning some 30,000 years ago, since when there has been no major eustatic change of sea-level, the coastline in this region could be estimated to have retreated landward a minimum of 45 miles during this era—that is, about half the width of the continental shelf in this region—if regression may be assumed to be continuing at a steady rate.

Further mangrove material is now being sought on this coast to provide additional dating information.

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Toxicity of Antimycin to Fish

Antimycin is an antifungal antibiotic of unusual chemical structure[1] which is toxic to a variety of living forms including yeasts and other fungi, insects and mammals, but not bacteria[2]. The work recorded here was concerned with its effect on fish.

Common goldfish approximately 2 in. in length and weighing about 1·5 g each were distributed among a series of uncovered clear glass jars containing 2·5 l. of water or test solution at a rate of 4 fish per jar. The water used (Madison, Wisconsin, city water from deep wells) had a *p*H of 7·3 and hardness of 325 p.p.m. After the fish had been in the water for one week the *p*H was 7·6–7·7. No special aeration of the water was provided during the experimental treatments.

Antimycin *A* (Kyowa Fermentation Industry Co., Tokyo, Japan, consisting of components A_1, A_2, A_3, and A_4 (ref. 3)) was dissolved in absolute ethanol and diluted to a concentration of 0·01 per cent. Small aliquots of this stock solution were mixed into the 2·5 l. of water in the test jars as needed to reach final concentrations of 0·1, 1, 10, and 100 p.p.b. In most cases the fish were introduced immediately, but to test the stability of the toxic principle some of the test solutions were allowed to stand in the laboratory at room temperature (approximately 75° F) under normal laboratory illumination (mostly artificial light) for varying periods before use.

Table 1. Effect of Antimycin *A* on Goldfish

Level (p.p.b.)	Ageing time (days)	Mortality ($\frac{\text{No. killed}}{\text{No. treated}}$)
100	0	4/4
10	0	4/4
1	0	4/4
0·1	0	0/4
100	1	4/4
1	1	0/4
100	2	4/4
1	2	0/4
100	3	4/4
100	4	4/4
100	5	4/4
100	6	4/4
100	7	0/4
100	8	0/4
100	9	0/4

The results, Table 1, demonstrate that antimycin is an extremely powerful fish toxicant, being 100 per cent lethal to goldfish (a resistant species) at a dilution of 1 : 1,000,000,000. Furthermore, it is apparent that, under the test conditions used, antimycin is rapidly degraded since the toxicity of the 1 p.p.b. concentration was eliminated after 1 day and of the 100 p.p.b. concentration after 7 days. It is quite possible that under field conditions the degradation would proceed even faster, as light has previously been shown to exert a deleterious effect on antimycin[4].

No effort to elucidate the mechanism by which the toxic effect is exerted was made. However, in view of the extreme potency of antimycin as an inhibitor of electron transport[5], it may be surmized that the substance is absorbed through the gills and interferes with the respiratory apparatus of the animal. The fact that the goldfish (in common with other gilled animals) is separated from its aquatic environment by a membrane only one cell layer thick[6,7] may account for the higher toxicity of antimycin against this species as compared with mammals. Rats, for example, survived doses of 12 mg/kg administered by stomach tube and 26 mg/kg/day consumed with the ration[3]. In contrast, the 2·5 μg of antimycin in 2·5 l. of 1 p.p.b. solution, if taken completely into the bodies of the four test goldfish, would amount to only about 0·4 mg/kg. Undoubtedly the actual lethal dose was much less than this amount.

The agent most commonly used for chemical fish control and eradication at the present time is rotenone at concentrations of about 25 p.p.b.[8]. One drawback to its use is