following description (which is unaccompanied by any illustration):—"The *aecidium* is found below the cortex of a stem or the epidermis of a leaf"; and shares his bewilderment on reading, in the paragraph dealing with cultural methods, the sentence:—"Artificial solutions . . . ought to contain the substances present in the diseased specimens."

Although "mykoplasm" is mentioned, no reference is made to the discovery of "specialisation of parasitism" by Eriksson and others. This leads the author wrongly to assume that the hop and pea mildews spread from their numerous wild host-plants to the cultivated plants in question. The view expressed that *Nectria ditissima* is always the secondary and not the primary cause of apple-"canker" was disproved some time ago. By a slip *Fusicladium dendriticum* is stated to attack pears; and it may be pointed out that *Alternaria* is not an Oomycete, *Hypochnus* is not an Ascomycete, and that green vitriol is not copper sulphite.

The illustrations are bad, some extraordinarily so—e.g. those of corn-mildew, vine-mildew, apple-scab, and Orobanche. The last-named is certainly worthless; six botanists (all familiar with the plant), to whom it was shown by the reviewer, all failed to recognise the plant.

The best we can say is that the descriptions of the various fungi mentioned are clear, and the book is very free from misprints. E. S. S.

Technical School Organisation and Teaching. By C. Hamilton. With a preface by G. Udny Yule. Pp. xii + 178. (London: George Routledge and Sons, Ltd., 1913.) Price 2s. 6d. net.

THE great and rapid changes which have recently taken place in the organisation of technical education in evening schools have (says Mr. Yule) created a demand for a new series of text-books specially adapted to the new circumstances. The present volume is issued as a general introduction to the series. Its aim is to define the proper scope and function of evening school work, to discuss the organisation necessary to make that work effective, and to provide—especially for those who, without previous training or experience, become instructors in evening schools—a simple exposition of the chief principles of teaching. It is evident that the author has excellent qualifications for performing his task. In his introductory section he shows so clear a grasp of the problems of evening school work, so sane a view of its possibilities and of the part it should play in a national scheme of education, that he gains at once the confidence of his readers. The same lucidity, liberality, and practical good sense characterise the subsequent section on the arrangement of courses, the details of administration and the functions of examinations. The final sections show a refreshingly sound appreciation of the principles of method, and much skill in applying them to the special problems of the technical teacher. It is probable that these 120 pages will prove the most helpful and informative part of a thoroughly useful book. T. P. N.

LETTERS TO THE EDITOR.

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An Attempted Photochemical "Resolution" of Silver.

THE recent correspondence between Prof. Schuster and Mr. Soddy in these columns suggests the placing upon record of a bold but unsuccessful attempt to split up the element silver which I made some years ago with one of my students. In these days, when tentative speculations are figuring so largely in the scientific world for positive knowledge, it may be necessary to point out that the research was prompted by no theoretical views concerning the compound nature of silver. But while there was no special *a priori* reason for suspecting the elemental character of that metal it was well known as a fact that its chloride, &c., on exposure to light only underwent a limited decomposition—i.e. that the photo-reduction ceased when a certain minute proportion of "photo-salt" had been formed. The consideration of this property of the silver halides suggested the interpretation (purely hypothetical!) that the "element" contained a constituent (say, α -silver) of which the chloride was sensitive to light, and another (say, β -silver) less sensitive or insensitive to light. From this it followed that if, after exposure and complete saturation with "photo-salt," the unchanged chloride could be separated from the photo-reduction product, the latter, on reconversion into chloride, should furnish a salt very highly sensitive as compared with the main portion of unchanged chloride.

For various reasons the research was never completed, chief among these reasons being the difficulty of effectively separating the minute trace of photo-reduction product from the large excess of unchanged chloride. Notwithstanding our failure, the experiment might be worth repeating under more favourable conditions since the relative sensitiveness to light of two specimens of silver chloride—the hypothetical α and β modifications—could be easily detected and possibly measured. Even if a negative result is obtained it would seem worth the expenditure of time and trouble in order to set at rest the question raised by the hypothesis. Should the result be positive it is needless to point out that the discovery might have important practical bearings upon photographic processes. It may be worth mentioning that in the course of our experiments it was found that a boiling saturated solution of aniline hydrochloride was a good solvent for silver chloride. What is wanted, however, for the present purpose is some inorganic solvent which dissolves the unchanged silver chloride at ordinary temperatures more freely than the metallic chlorides (lithium, &c.) hitherto used for this purpose. Reagents like thiosulphates, cyanides, &c., which form salts with and freely dissolve silver chloride, appear to decompose too much of the "photo-salt" to be of use in such an inquiry. The bearing of the present discussion upon our abortive attempt to "resolve" silver is sufficiently obvious—is the darkening of a silver salt under the influence of light a case of "physical analysis"? R. MELDOLA.

Bournemouth, March 22.

Dana's Proof of Darwin's Theory of Coral Reefs.

IN connection with Prof. Davis's paper on Dana's proof of Darwin's theory of coral reefs, which appeared in NATURE on February 6, it is interesting to point out that land valleys which extend beneath the

sea are not always proofs of subsidence. Such valleys, like coral reefs, may owe their existence to different factors in different cases.

The harbours of this coast are the high parts of submarine fault valleys, and the portion bordered by land is often only a small part of the whole. Yet the evidence is very clear that the coast has risen regularly since the Red Sea was made, and that river erosion has had nothing to do with the formation of these steep-sided rifts. The coast of equatorial East Africa is essentially similar, though there the fault features are not so obvious, as they have been smoothed down somewhat by the heavy rainfall. Yet such harbours as Mombasa, Kilindini, Tanga, and Wasin are obviously homologous with those of Port Sudan, Suakin, and the desert harbours of the Red Sea.

Chwaka Bay, on the east coast of Zanzibar, is part of a depression which runs right across the island in a south-west direction, and forms long inlets where it reaches the sea on the other side.

The island of Pemba, a little north of Zanzibar, is dissected in a wonderful way on its west side by long fiords running far into the land, and ending in mangrove creeks, perfect slaver- and pirate-hiding places. The land is comparatively high and of great fertility, so that a coasting voyage among the fiords is one of great pleasure and interest.

Surely these are typical drowned valleys? Not at all; the island, like Zanzibar, was elevated in late Tertiary times, the fossils of its coral cliffs are Pleistocene or recent, and both islands have remained at or near their present level while their reefs were carved out. In places on the east coast of Zanzibar the reef is up to three miles wide, and is something between a fringing and a barrier formation. Yet it was all formed by abrasion of elevated coral land.

Along the edge of the deep water, in a line at right angles to the Pemba fiords, is a regular but broken line of reefs and islands, a typical barrier. Where the islands have not been worn away by the sea they are formed entirely of elevated coral, and the reefs have been formed by abrasion of land. When this process is complete, there will be a typical barrier reef, should the islands continue stationary at the level to which they were originally elevated.

The two islands, Zanzibar and Pemba, were originally regular oval cups of coral (or perhaps saucers rather, as in Pemba coral limestone is seen at lowest tide level a long way up Chaki Chaki Bay), and were connected with the mainland. These were filled with the sand and pebbles which now form most of the hills. After elevation they were cut off from the mainland by marine erosion, possibly (in the case of Pemba at least) also by a comparatively deep fault. Other faults on this side cracked the saucers, and irregularity was further induced by marine abrasion, in some places made excessive by powerful silt-bearing currents, in others neutralised by the protection afforded by growing coral and algæ. As along the deep water conditions more uniformly favour the growth of protecting organisms, the edges of the saucers retain their regularity, while within the mass of sand and the limestone on which it lies is subject to rapid degradation. The fiords are extending into the land among the mangrove swamps at their heads. The roots of the mangroves penetrate the crevices of the coral and cause shallow accumulations of mud, both factors for the disintegration and solution of coral limestone. I take the extremely complicated outline of the south end of Pemba Island to be an example of the barachois described by Prof. Gardiner in the results of the Percy Sladen Trust expedition to the western Indian Ocean.

In the Red Sea the heads of the harbours are being filled in with blown sand and flood-borne alluvium, but in Pemba there are no delta-like formations; the marine currents are far too powerful to allow of them, even if the streams were big enough to convey any quantity of alluvium.

In the Red Sea and equatorial East Africa we thus have, on stationary or rising coasts:—(1) Submarine valleys which are scarcely altered from the original fault rifts; (2) those of similar origin somewhat disguised by the effects of tidal currents and fresh-water streams.

The above have little if any continuation into the land, but in Pemba are found:—(3) Long fiords simulating drowned valleys, but of the same origin as (1) and (2); (4) barrier reefs formed by abrasion alone, in Zanzibar and Pemba.

In the Red Sea are (5) barriers which are features of the sides of a rift valley merely coated with coral.

(6) The barriers of the equatorial coast may be of the same origin as those of the Red Sea, but, if Zanzibar Island be reckoned a part of this barrier, removal of the intervening land has been at least the cause of the final separation, as proved by the fauna of the island. Probably they are comparable to the barrier of the west side of Pemba in structure and origin, due to the faulting and erosion of the heterogeneous material of coral deposits.

My statements here are dogmatic for want of space, but details are given in my papers in *Proc. Camb. Phil. Soc.*, 1902, and *Journ. Linn. Soc.*, vol. xxxi., 1907 and 1911.

My being in a distant and isolated village, which is, however, a few yards from coral reefs, is my excuse for the delay in your receipt of this contribution to the discussion.

CYRIL CROSSLAND.

Dongonab, Red Sea, February 24.

Elliptical Lunar Halos.

On the morning of January 26, 1908, while observing with the Keeler reflector of this observatory, I noticed a curious lunar halo, which I described as follows in the notes made at the time:—

"At 4.25 a.m. (Eastern standard time) I saw an elliptical halo close to and concentric with the moon. Its major axis was vertical, and was about 7° long, the lunar diameter being used to make this estimate. The horizontal axis was a little less than half the vertical, or about 3°. The halo lasted only about one minute, but was unmistakable, being well defined (except near the bottom) on both its inner and outer edges. It reappeared less distinctly at 4.31 a.m., lasting only a few seconds. I watched the moon until 4.50 a.m., but saw no third appearance. The halo was white in colour. There was a light east wind blowing at the time, and there was a little haze in the sky. The temperature was 28° F., and had been very constant all night. The moon was at last quarter."

At my request the other observers here have watched for such a halo, and on December 1, 1908, both Prof. Jordan and Dr. Baker witnessed a much longer appearance of it. Prof. Jordan's notes read as follows:—

"An elliptical lunar halo was visible here on the evening of December 1, 1908. The night began with a very clear sky, but about eight o'clock a slight haze became visible in the neighbourhood of the moon. This soon began to take definite form, and the halo developed. It remained visible until about 9 p.m., when it gradually disappeared and the sky soon became cloudy. The halo varied greatly in brightness because of the varying amount of haze in the atmosphere: very