

phenomenon has ever been published, although it has been several times referred to by travelers, who have ventured various crude guesses at its cause, varying from that commonest catch-all of the ignorant, "electricity," to the whistling of the wings of ducks and the noise of the "steamboat geyser." It seems to me to belong to the class of aerial echoes, but even on that supposition I can not account for the origin of the sound.

I am surprised that it has not been studied and understood before now and I hope that some of the many scientific men who doubtless visit the park every year may find in it an attractive problem for vacation study.

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VARIATIONS IN COLORS OF FLOWERS

I HAVE noticed for a good many years considerable variation in the color in the flowers of many of our native plants. The plum is now in full bloom. Within a few hundred feet of here there is a beautiful specimen along the roadside that the axe has spared so far. It has a decided shell-pink color, and is one of the finest native plum trees I have ever seen. A little further on, on the edge of the woods, is another plum tree with cream-colored flowers, and not very far from this tree one of pink color, almost the color of the peach blossom. I noticed recently near Green Bay, Wisconsin, also a plum tree of decided pink, but not as pronounced as the one mentioned above. Then we have those that are pure white and others with a light grey touch.

Our western crab apple, *Pyrus Ioensis*, usually shell pink, is very often found in full pink. There are some trees here of beautiful rose color, the finest rose I have ever seen amongst flowers.

In a ravine or blow-out in the Dune Country near Grand Branch, Michigan, the majority of flowering dogwood, *Cornus Florida*, are pink or rose, and I have been told that a few miles from there, there is another colony of the pink-flowering dogwood.

On a recent trip to Eastern Kentucky and Tennessee I did not notice a single pink-flowering dogwood except those in the gardens purchased from nurseries. Are these varieties in colors of the flowers due to natural hybridization or difference in soil? The plums I have mentioned all grew in clay, the pink dogwoods in sand, the dogwoods in Kentucky and Tennessee in clay or stony land. Whatever the cause, this natural variation gives the nurseryman a chance for a greater color variation for the gardens, and it seems to me this will in time partly settle the grievance amongst many of our people against the embargo. Perhaps the embargo is a good thing from more than one standpoint. It will give us a chance to look into

native land and perhaps discover new beauty for our gardens, making them typical American.

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ZYGOPHYLLUM FABAGO IN THE UNITED STATES

IN SCIENCE for June 25, 1926, the Syrian bean caper, *Zygophyllum Fabago*, which had been found at Mesilla Park, New Mexico, January, 1925, was given as a plant new to the United States. Mr. J. C. Buchheister, of New York City, found a few plants of this *Zygophyllum* on Port Morris ballast grounds, June 10, 1900. He sent specimens to Dr. J. N. Rose, who said it had not been reported before from the United States. I collected it also at Port Morris on Long Island Sound, Bronx Borough, New York City, June 5th and July 8th, 1901. All these collections are in the herbarium at Cornell University. Mr. Norman Taylor in his *Flora of the Vicinity of New York*, says that, "*Tribulus terrestris* L. and *Zygophyllum Fabago* L. have both been collected near the metropolis. They are very doubtfully established." The ballast grounds at Port Morris must have been destroyed and built over many years ago.

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SCIENTIFIC BOOKS

Bacterial Infection with Special Reference to Dental Practice. By J. L. APPLETON. Published by Lea and Febiger, Philadelphia and New York, 1925.

THE dental profession and others interested in the microbiology of the mouth have waited long for some one to do what Professor Appleton has done. But "*Bacterial Infection with Special Reference to Dental Practice*" will prove valuable, not only to those who are especially interested in oral infections, but also to physicians, bacteriologists and immunologists. It is notable among recent new text-books in bacteriology for its original discussions and for its excellent up-to-date analysis of the literature.

The book is divided into three parts. Part I deals with bacteria, their morphology, physiology and classification. There is a separate chapter on the relation of bacterial growth to oxygen supply and another on chemical disinfectants, in both of which emphasis is given to the peculiar problems connected with oral hygiene. One outstanding feature is the compilation of data on limiting and optimal hydrogen-ion concentrations of various bacteria; another is the author's treatment of sterilization by heat. Both Migula's classification (modified from Chester) and Bergey's classification are summarized, but while the author is

nominally committed to a preference for the latter, in spite of its bizarre features, he may perhaps be excused for failing to follow it throughout the text, for, if he did, much of the presentation would be unintelligible to the average reader without considerable effort.

Part II treats of infection as a concept, methods of disease transmission, the characteristics of infection, predisposing factors, types of infection, modes of disease production, the defenses of the host (humoral and cellular), resistance and immunity, and artificial immunization. The importance of disease carriers, both to the dentist and to his patients, is adequately emphasized. But the dental aspects of the problem in this portion of the book are really incidental; infection and immunity are presented from a broad scientific standpoint and the references to the dental applications do not obtrude but rather serve to round out the discussion of a subject in which this phase is usually neglected.

The special infections of the oral cavity are covered in Part III, with careful and fairly complete reviews of the bacteriology of the streptococcus-pneumococcus group, the oral spirochaetes, dental caries, periapical infections, pyorrhea alveolaris, Vincent's Angina, tuberculosis, syphilis, focal infections and the rare gonorrheal stomatitis. The final chapter is devoted to clinical dental bacteriology in an attempt to organize a satisfactory technic for this poorly developed field.

There are few adverse criticisms, and none serious. An obvious misprint, as on page 188 (lines 9-10), and the apparent misplacing of a few paragraphs, as at the bottom of page 194 and on page 195, can be corrected easily in a new edition.

The general makeup is pleasing. There are ninety-one engravings and five colored plates. It is the best general contribution to the subject of dental infections that has appeared since 1890, when W. D. Miller published "The Micro-organisms of the Human Mouth."

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SPECIAL ARTICLES

A PRELIMINARY NOTE ON THE ETIOLOGY OF VERRUGA PERUVIANA

IN certain narrow valleys among the Andes Mountains, particularly between Lima and Oroya in Peru, a peculiar disease exists which has long been regarded with special interest not only by local physicians but by all workers in the field of tropical medicine. The lesions on the skin, as the name "verruca" suggests,

have the form of nodules or warts. As a rule the disease is of chronic type, and there are evidences of systemic as well as local infection, *e.g.*, fever, which is usually mild and of intermittent or remittent character, and anemia of moderate degree. The eruption on the skin is often preceded by a period of acute high fever, during which anemia is very severe, and peculiar bacilliform microorganisms are demonstrable in the red blood cells. This condition, which is called Oroya fever, may also occur simultaneously with the eruption on the skin, or it may follow the local manifestations. For many years Oroya fever was regarded as the severe form of the disease and verruga a milder manifestation of the same infection, but this theory has been open to question since 1913, when a commission from the Harvard School of Tropical Medicine studied both conditions and pointed out that their frequent association in the same individuals and their similar curious geographical distribution did not necessarily indicate that they were caused by the same parasite. The Harvard commission concluded that two distinct diseases were involved, because (1) either condition might occur independently of the other, (2) the peculiar intracorporeal parasites, discovered by Barton in 1906 and named *Bartonella bacilliformis* by the commission, were not found by them in cases of simple verruga, and (3) monkeys and rabbits were readily infected with verruga by direct injection of suspensions of nodular tissue from verruga patients, but inoculations of a monkey and rabbits with blood of Oroya fever patients yielded no results, notwithstanding the presence of the parasite in the blood injected.

In order to determine whether or not Oroya fever and verruga are actually different phases of the same disease, it was necessary to isolate the microbic incitant in each instance and make comparative studies of the morphology, cultural properties, pathogenicity, and immunological relations of the microorganisms. It was recently found,¹ as reported in this JOURNAL, that the parasite of Oroya fever, *Bartonella bacilliformis*, could be isolated in pure culture, and that various manifestations of the disease could be induced in young *rhesus* monkeys by inoculation of the culture. It also developed in the course of the experiments that inoculation of the cultures of *Bartonella bacilliformis* into the cutaneous tissues of the monkeys induced at the site of injection a typical "verruca" indistinguishable from that observed in human beings or in monkeys directly inoculated with verruga tissues. *Bartonella bacilliformis* was demonstrated both in the skin lesions and in the erythrocytes of the experimental animals.

¹ Noguchi, H., and Battistini, T. S., SCIENCE, 1926, lxiii, 212; *J. Exper. Med.*, 1926, xliii, 851.