established New England variety and the strain which carries the waxy endosperm is typical of the variety in type of plants, ears and grain.

The origin, in an American variety, of this peculiar endosperm texture, previously found only in several isolated Asiatic localities, will probably remain a matter for speculation. It may have arisen by mutation within the past few years, or it may have been carried by the stock as a hidden recessive for centuries. In any case its appearance may be regarded as a further bit of evidence against the theory of a pre-Columbian distribution of maize outside of the American continent. Nor would it be surprising if a thorough investigation, by the process of inbreeding, should bring to light waxy endosperm in a number of additional American varieties.

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## THE METRIC SYSTEM

SCIENCE for June 13, 1924, contains a letter advocating the metric system. I can not see how the metric system can be of any greater value to the ordinary person than the present system. The decimalists are too fond of overrating their own exploits. Even with the coinage I find after 12 years residence in Canada that the money system is no simpler than the pounds, shillings and pence of England and I find with constant trading with the United States that the rate of exchange does away with any advantage which a common money system may have. And how is it that the "quarter" is so popular? It surely should not have a place in a decimal system. In my opinion a decimal system may be all right for an ignorant and unlettered community and possibly here the advocates in the United States may make a big claim for its use.

It is amusing to see Mr. McAdie claim that scientific men the world over champion and use the metric units. Apparently engineers and the engineering profession in general are not scientific. Why, even a cook[1] may be more scientific than a meteorologist. Mr. McAdie does not see that although it may be an advantage for those who "analyze" to use a decimal system such a system is of no importance to those who "manufacture." For the latter—and they are the useful people in this world—a binary system or a duodecimal system is much better.

I have been teaching physics in Toronto for the last twelve years and have introduced the English units more and more as the years have gone on because I find the students understand them better. Especially is this true in mechanics. I note what the writer of the letter says about the questions in the school arithmetics. I always imagined that they were inserted to give the pupils practice in arithmetical manipulation. I never thought that they would be used to condemn the English system. You might as well condemn Christianity because it is a hard faith to live up to.

The trouble with men like Mr. McAdie is that because they like a thing they think all the world must agree with them. They never see the other side.

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[1] Mr. McAdie is rather scornful of the cook who measures by cups.

## PERMANENT PHOTOGRAPHS

DR. CLARENCE H. KENNEDY'S experience with platinum photographs as told in the issue of SCIENCE for July 11 is another confirmation of the permanence of this printing process. In the *British Journal of Photography* of December 24, 1909, was an account of some platinum prints recovered in October of that year from the wreck of a war vessel, after having been under the sea for more than five months. The cardboard mounts were disintegrated, and the surface paper, to which the prints still adhered, was ruined by the water. But the prints themselves were bright and clean as if freshly made.

Present day photographers, spoiled by the ease and convenience of modern photographic processes, may think platinum printing difficult, but it used to be regarded as very simple and easy. The paper is partially printed by daylight or electric arc, and developed in a solution of potassium oxalate and potassium phosphate. It is then passed through three acid baths, and finally washed in water for 15 minutes, the whole procedure of developing, fixing and washing taking only about half an hour. The resulting picture is, Dr. Kennedy says, as permanent as the paper on which it is printed. If the print has not been properly "cleared" in the acid baths, the paper may in time turn yellow, but the discoloration is easily removed with a bleaching solution of acidified hypochlorite without affecting the platinum image. The chief drawback to the use of platinum paper is its high price.

CHARLES MACNAMARA

## SCIENTIFIC BOOKS

*Galapagos: World's End.* By WILLIAM BEEBE. G. P. Putnam's Sons, New York and London, 1924, xxii + 443 pp., with 24 colored illustrations by Isabel Cooper and 83 photographs, mostly by John Tee-Van. Published under the auspices of the New York Zoological Society.

SINCE the publication of "The Voyage of the

Beagle" Galapagos has been a name with which to conjure up vistas of weird reptilian life, giant tortoises, strange marine lizards, of finches and hawks unaffrightened by man and of a marine life brilliant and varied such as only the tropics can produce. Expeditions have come and gone from these volcanic wastes and have reported their biological finds with elaborate technical detail and an ever-increasing confusion of interpretations as to the species limits and relationships of the isolated faunas of the various islands of the archipelago. Save for the herpetologist, ornithologist, coleopterologist or other specialist or for the student of the many problems of evolution, geographical distribution, isolation and animal behavior, these analytical reports make dry reading, not so Mr. Beebe's "World's End."

This entertaining work is the outcome of an expedition on the private yacht "Noma" to several islands only of this large archipelago in 1923. In all less than one hundred hours were spent in exploration, mostly on five of the smaller islands of the group, Eden, Guy Fawkes, Daphne, Seymour and Tower. Excellent use was made of the time, however, and the story of adventure amidst the turbulent breakers, lava cliffs and slopes, cactus and thorn and shelly beaches loses nothing of interest at the hands of this facile, brilliant and sympathetic interpreter of nature and life.

The author is keenly alert to the biological problems involved in the adaptations exhibited by the species of animals inhabiting these waste and desolate desert islets and islands. The margin of existence is narrow, and liable to temporary and local interruptions by slight disturbances in the balance of nature. Man and the animals introduced by him have been the great disturbers. The giant tortoises are even now partially exterminated and will not long survive unless protected. On the other hand, the absence of marauding mammals in the native fauna has exempted the birds from the selective action of this factor operative on their mainland relatives.

The reviewer well remembers his impressions of the finches on Chatham Island in 1905 when the U. S. S. *Albatross,* then en route on the Agassiz Expedition to the Eastern Tropical Pacific, lay at anchor at Wreck Bay. In the thorny scrub which covers the lower slopes of that blackened, lava-strewn island the most conspicuous objects are the numerous black finches, recalling in color though not in size our own crows and blackbirds. Every vestige of protective coloration in their plumage is eliminated. Add to this the astounding lack of fear which they exhibit and the impression is overwhelming that the presence of mammals in the animal associations of any region is a potent factor in both the structure and behavior of the birds. Wild dogs ranged in the Chatham Island scrub, but they are so recent as apparently to have wrought no changes even in the behavior of the finches. One could call them up in great numbers. They would perch close at hand, even on his hat and shoulders, with freedom and seeming curiosity but without fear. Dr. Beebe notes the results of this cessation of selection in the abundance of other erratic features, such as the frequent irruptions of partial albinism and unusual behavior in breeding. Structurally one finds an orthogenetic development of bill in these finches of the Galapagos. The bill is already abnormally large in finches generally, but it is excessively large in certain species and is progressively developed among those of the Galapagos to extremes which far exceed the bounds of necessity and apparently of utility.

The book is rather sparingly illustrated but with fine taste and skill. The text likewise has esthetic qualities of rare value. The reader shares the zest of exploration, is spellbound by the tragedies of the tropic seas, with their teeming fish and bird life, and of the castaways of long ago from distant shores stranded on these desert islands.

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## SPECIAL ARTICLES

### THE INDUCTION OF GROWTH PROMOTING AND CALCIFYING PROPERTIES IN A RATION BY EXPOSURE TO LIGHT

IN verifying the work of Goldblatt and Soames who observed that livers taken from rats irradiated with light possessed growth promoting properties—which were not possessed by livers taken from non-irradiated rats—it was found that a growth promoting property could be conferred upon muscle tissue by illuminating it after its removal from the body. It was also found in another series of experiments that irradiated rats put in the same cage with non-irradiated rats were able to induce growth in the latter.

Proceeding on the assumption that failure of growth on our basal synthetic rations without the effect of illumination was due to a condition fundamentally the same as rickets, experiments were initiated in which our basal synthetic ration of purified food materials was illuminated and then fed to rats. Here also illumination of the ration caused it to become growth promoting and, in addition, it was found that the ash content of the bones of rats receiving such a ration was increased percentagely over that of rats receiving the non-radiated ration. Later it was also