successive epochs, it gradually wasted away, broke up into islands, and finally disappeared. The ocean reclaimed its ancient sovereignty, and its shores gradually assumed their present outline.

RECENT DISCOVERIES CONCERNING THE CURRENTS OF THE PACIFIC.

Thomas Gray, of the London Board of Trade, has recently published some observations on the equatorial currents of the Eastern Pacific, which not only concerns the navigator, but are of general scientific interest. From the *Herald's* account of his paper we learn the following facts: These observations were taken by Captain McKirdy, of the steamship "Peruvia," plying between Peru and China, and their results show, as Mr. Gray says, that some of the currents of the Pacific Ocean are not what they have hitherto been thought to be. The Admiralty charts, and almost all ocean charts, delineate a counter equatorial current north of the Equator, and between the meridians of the Sandwich Islands and South America, and running eastwardly, instead of obeying the general impulse of all equatorial waters. In order to prove whether it exists or not, Captain McKirdy ran his ship from Callao to Honolulu on a straight line course, and repeatedly found that the supposed counter current had no existence in the spring within the limits assigned to it by the charts, but, on the contrary, a steady current setting westward was met day by day. On the third survey of the ocean area, in which hydrographers have generally placed the equatorial counter current, when in latitude 2 degrees north, longitude 122 degrees west, an extraordinary change took place. In a four-hours' run the temperature of the sea went "down with a jump from 79 to 71 degrees, and the water changed color from a deep bluish-black to a dark, dirty green"—the former color and high temperature indicating unerringly the presence of the great westerly equatorial current, and the latter with the low temperature, the sweep of Humboldt's current, a vast flow from the Antarctic basin which penetrates to the Equator and curves to the west of the Galapagos Islands. The able observer on the "Peruvia" had now conclusive evidence that his ship, to use his own words, "had been contending with a mighty river running partially through the Pacific Ocean to the westward."

Many years ago Lieutenant Maury said: "There are some of these equatorial currents in the Pacific which I do not understand, and observations are insufficient." The present results of McKirdy's explorations go far to clear up the long-felt mystery. That an equatorial counter current does exist somewhere in the broad Pacific is unquestionable, and Captain McKirdy recognizes its existence, though his researches necessitate a reconstruction of the charts which locate it. But the chief results of his labors is the discovery of the powerful westerly current of "deep, deep blue," easily distinguished from the bright, beautiful blue waters of the surrounding North Pacific, and detected by its temperature, but marked geographically by its irregular "horn-shaped" extension (one end pointing to Panama and the other to the Sandwich Islands). The explanation of this remarkable current is found in the southerly drift along the Californian and Mexican coasts of a body of water, possibly a continuation of the Japan stream, or Kuro Siwo. "This body of water," he says, "gets pent up in the Gulf of Panama; it cannot get south on account of Humboldt's current, which is constantly flowing north along the coast of Peru. It follows, then that these two streams, each striving for the mastery, change their course to the westward, and rushing along side by side to the Equator until they meet the equatorial counter currents which splits them like a wedge, the northern one preserving its 'deep, deep blue,' and the southern its 'dark, dirty green,' which clearly proves it to be of extreme southern origin." This would explain the case of a Japanese junk cast upon the Sandwich Islands after a ten months' drift, moving on the great circle track of the "black stream," or Kuro Siwo, across the Pacific to the Californian and Mexican coasts, and thence westwardly. The newly noted stream will be of great value to the mariner, as in it the "Peruvia" made over 325 miles a day.

SANITARY ERRORS.—It is a popular error to think that the more a man eats the fatter and stronger he will become. To believe that the more hours children study the faster they learn. To conclude that if exercise is good, the more violent it is the more good is done. To imagine whatever remedy causes one to feel immediately better is good for the system, without regard to the ulterior effects.

THE CULTIVATON OF VACCINE VIRUS.

Dr. Martin, of Boston, was the first American physician who, in view of the danger attending the use of vaccine virus taken from the human body, experimented successfully upon a return to Dr. Jenner's original method of using the bovine virus. Dr. Foster, of New York, and in 1867 Dr. Robbins, of Brooklyn, followed Dr. Martin's example, and Dr. Robbins, with his associate, Dr. Lewis, is now engaged in the production on a large scale, of virus derived from Beaugeney stock, upon which they have "ingrafted" the celebrated Vincennes stock, to procure which Dr. Robbins made a special visit to France. It is worthy of note, however, that the original stock is just as potent as ever, though its powers vary according to the constitution of the animal from which it has been obtained. The *modus operandi* is to select the best calves—heifers being preferred—at an age varying from a few days to a year or even more, but the younger the better, the animals being the more easily handled. If the subject is a small one it is thrown upon its side upon a table, and its fore feet and head being secured, its hind legs are stretched apart and spots upon the belly six or eight inches wide are shaved, and if necessary the epidermis or skin is thinned down. After this vaccination as in the ordinary manner is proceeded with, the animal being retained in the one position for six or seven days, when the matter is ready for removal either into tubes or quills, and must be as clear as water or else rejected. Calves of the Jersey breed are preferred. Drs. Robbins and Lewis have sent the vaccine to France, to Egypt, to China, Japan, and to all parts of North and South America. The greatest care is taken to provide that the calf which is to be vaccinated shall be in the best possible health. It is said that the calves do not appear at all inconvenienced by their confinement, but munch their food with zest and in fact get fat. During the summer animals which are "under process" are kept in the country, it being found that they thrive better than in town.—*New York World.*

A MOST novel proceeding occurred recently in the forests of Canada which, if found efficacious, should be hereafter universally adopted. At the terminus of the St. Lawrence, Lower Laurentides & Saguenay Railway, which is intended to connect Three Rivers with Lake St. John, and is being built in the Saguenay country, an audience of over a thousand people were assembled to witness the ceremony of blessing the new enterprise by the Bishop of Three Rivers. The scene is said to have been impressive. The people, mostly of the laboring class, stood in silence before the venerable prelate, the iron track and the train of cars were the mute subjects of the service, and the whole was overshadowed by the sombre forest, whose leaves were already tinted with autumnal splendor. The Bishop alluded to the fall of man, the necessity for toil and the obstacles encountered by all in the efforts for advancement. He spoke of the undertaking before them, its bright future of usefulness and, in conclusion, proclaimed the Angel Raphael to be the Guardian of the new line and besought a blessing upon the enterprise and all concerned in it. If it be found that this road is signally favored and its interests advanced by this ceremony and invocation, we venture the prediction that all railway managers and owners will be anxious for a similar blessing for their roads and will eagerly seek for an ecclesiastic to confer the boon.

COPPER-PLATING ON ZINC.—The use of cyanide baths for plating on zinc has the double disadvantage of being poisonous and expensive. A recent discovery has overcome the objections by rendering the cyanide bath unnecessary. This is accomplished by the use of an organic salt of copper, for instance a tartrate. Dissolve 126 grammes sulphate of copper (blue vitriol) in 2 litres of water; also 227 grammes tartrate of potash and 286 grammes crystallised carbonate of soda in 2 litres of water. On mixing the two solutions a light blueish-green precipitate of tartrate of copper is formed. It is thrown on a linen filter, and afterwards dissolved in half a litre of caustic soda solution of 16° B., when it is ready for use. The coating obtained from this solution is very pliable, smooth, and coherent, with a fine surface, and acquires any desired thickness if left long enough in the bath. Other metals can also be employed for plating in the form of tartrates. Instead of tartrates, phosphates, oxalates, citrates, acetates, and borates of metals can be used, so that it seems possible to entirely dispense with the use of cyanide baths.

ENCOURAGING SCIENTIFIC RESEARCH.—M. Pasteur has received from the French Government the sum of $8,000, to assist him in continuing and completing his valuable investigation upon the *contagious diseases* of animals.