THE CANARY FISHERIES.

For a number of years it has been known that the sea about the Canary Islands was well stocked with cod and other desirable varieties of fish; but it is only recently that the real value of those fishing grounds has begun to be appreciated. A late number of the *Journal of the Society of Arts* contains some very important information on this subject, from which it appears that under proper management the Canary fisheries might be made extremely valuable. Mr. Berthelot, late French consul, reports that the quantity of fish caught by one man in the Canaries is equal to that caught by twenty-six men in Newfoundland. All evidence tends to show that the quantity caught is very great, and that the supply is inexhaustible. And yet neither the native fishermen nor the commercial community of the islands have endeavored to turn this immense field of wealth to any advantage, being satisfied thus far with confining their operations almost exclusively to the supply of the local consumption. The largest fish banks are said to be from the Island of Fuerteventura to Cape Blanco. The vessels fish down to the latter point, and the larger ones sometimes go very near to Cape de Verd.

Until our fish commission succeeds in restocking our coast with cod, American fishermen may find the Canary field worth cultivating, particularly as the best season there is during the winter months.

THE IRON OCEAN PIER AT LONG BRANCH.

Work upon the great pier and breakwater, which are to convert Long Branch into a sea port and an accessible summer resort for New Yorkers, is progressing rapidly.

For the benefit of our distant readers, we will say here, that Long Branch is a favorite seaside resort for the wealthy citizens of New York and Philadelphia. It lies on the New Jersey coast twenty-eight miles south of this city; and the only obstacle to its becoming as noted and popular a bathing place as Coney Island or Rockaway, on the southern shore of Long Island, has been the lack of a landing place. This want is now to be supplied by building a pier straight out into the Atlantic, a distance of 660 feet, and in front of its outer end a breakwater 225 feet long and 50 feet wide. The breakwater is to consist of three lines of iron piling so interlaced with chain work as to form a sort of sieve, through which the first breakers are expected to pass, losing their force thereby and their power to damage the boats made fast to the pier. The cost of the sea wall (to protect the cliff), the pier, and the breakwater is estimated at $200,000. The sea wall is already finished. Work on the pier was begun February 4, and it is expected that the entire structure will be completed in time for the summer's demands. The pier is to be formed of three lines of tubular iron piles, strongly interlaced with iron girders, the deck to rise fifteen feet above high water. As the sea bottom is sand the sinking of the piles is an easy matter. The method adopted for sinking them is as simple as it is effective. At the lower end of each pile is placed a "shoe" shaped like a sugar loaf, and having in its point an inch hole. The pile being held in position by ropes, a stream of water is forced through it by a steam engine or a float, the water cutting away the sand and allowing the pile to sink.

The first result of the improvement will be to make the trip to Long Branch a delightful sail, costing less than half the amount hitherto charged. This, in addition to the attractions of the place, is counted on to divert to it a considerable share of the patronage secured by Coney Island last summer, a patronage rising as high as 70,000 visitors a day.

HONEY SUGAR.

The Bee-Keepers' Association desire to return good for evil. While dishonest men are striving to spoil the honey market by selling imitation honey made of glucose and artificial flavorings, the bee-keepers are anxious to furnish an unquestionably wholesome substitute for the glucose used by cooks, confectioners, and brewers. Accordingly they have offered a prize for the discovery of a method of converting honey into a form of crystalline sugar. California honey already sells for seven cents a pound at wholesale; and whoever will succeed in producing a honey sugar will give a great impetus to an already profitable and rapidly growing industry. It is needless to add that he will also win a prize to which the bee-keepers' offer will be only an earnest.

THE USE OF COLD WATER IN COLD WEATHER.

It should not be forgotten, says the *Lancet*, that in cold weather the sole use of cold water is to stimulate the organism to increased activity. A great mistake is made when any part of the body is immersed in cold water, and left to part with its heat without any guarantee that the energy of heat production, so severely taxed, can respond to the requirement. It may easily happen that the internal calorific force will be exhausted, and if that occurs harm has been done. The obvious principle of health preservation is to maintain the circulation in its integrity; and while the error is avoided of supposing that clothing can do more than keep in the heat generated within, it is not the less needful to guard against the evil of depriving the body of the heat it has produced. The furnace should be well provided with suitable fuel—that is, nutritious food. The machinery of heat production (which takes place throughout the organism, not in any one spot or center) should be kept in working order, and nothing conduces to this end more directly than the free use of the cold douche and the shower bath; but the exhibition of these popular appliances, in all or any of their forms, ought to be restricted to a few seconds of time; and, unless the evidences of stimulation—redness and steaming of the surface—are rapidly produced, the affusion should be laid aside.

The use of cold water in cold weather is a practice which must be governed by rules special to each individual case; and it is with a view of warning the public against the recourse to general recommendations that the subject is alluded to. Whether the practice recommended be that of plunging the feet in cold water before going to bed to procure sleep—a reckless prescription, founded on a physiological fallacy—or any other use of cold water, the only safe course is to seek the counsel of a medical man conversant with the patient's peculiarities; and this precaution should be particularly observed in the cases of children.

GUATEMALA INDIGO.

The catalogue of objects exhibited by the Republic of Salvador at the recent Paris Exhibition contains the following contribution to the history of the cultivation and preparation of indigo in Salvador: This species of indigo is known to American and European commerce as "Guatemala indigo." In Salvador it is called by the native name of "Iiquilite," and is considered the most important agricultural crop of the entire republic. The plant grows wild, but is cultivated in properly prepared ground. Both the crops and produce vary according to the geological composition of the soil. Thus at the base of the volcano of San Salvador the yield of dye is sometimes about half a pound per load of leaves, while at Santa Barbara and Santa Cruz, situated at some distance from the sea, thirteen or fourteen ounces are obtained. Indigo is grown over nearly the whole of Salvador, forming extensive fields, and furnishing one of the most valuable products to its agricultural industry. The localities in which the plants are grown are called "manchones."

The workmen, who are styled "sacateros," cut the plants with a small sickle, and make them up into sheaves of from 50 to 60 pounds weight. The plants, after being cut, are thrown into vats filled with water; they are here allowed to soak for a period of from twelve to seventeen hours, the time varying according to the temperature and quality of the water. When the liquid is in a state of fermentation the coloring matter is drawn off into another vat, where it is beaten, or kept in motion by means of wooden wheels, and then the dye is precipitated by the sap contained in the bark of the "tihuilate," of the "platanillo," or of the "cuaja tinta." The first named bark is referred to a species of *Ionidium*, the second to *Canna indica*, while of the third no clew is given as to the scientific name of the plant. All these plants have an acid reaction. When once the dye is precipitated it is allowed to remain during the night, and the next day it is boiled, filtered, pressed, and lastly dried in the sun. Each bale, or "suron," contains 150 pounds, and the different qualities of grades of the indigo are specified by numbers—from four to six ordinary quality, or "cortes;" from seven to nine, fine or superior, or "sobresalientes."

The usual annual produce of indigo in Salvador amounts to about 2,400,000 pounds, the annual exports being between 14,000 to 15,000 "surons," of 150 pounds each, representing an approximate value of 1,721,378 piastres or dollars. The superior quality indigo is sold at the country fairs at about 8 reals per pound. In the American and European markets the prices vary, of course, according to the supply from other countries.

LIGHT AND LIFE.

During the last few years quite a number of investigations have been made in order to determine the question as to how living organisms are affected by the different colors of the spectrum, the subject of plant life having more especially received the attention of observers. The results of two independent series of researches—one by M. Paul Bert on plants, and the other by M. Young on the eggs of animals—have lately been communicated to the French Academy, and it is interesting to compare them.

M. Bert kept certain plants in a glass trough inclosure, containing an alcoholic solution of chlorophyl, and exposed them thus to a good diffused light. The chlorophyl solution, which was very weak, and in a very thin layer, intercepted little more than the characteristic region of the red in the spectrum. This excluded part, then, was proved to be the indispensable element of white light, for the plants at once ceased to grow, and soon died. It is in this red region (as has been shown by M. Timirigzeff, recently) that the greatest reduction of carbonic acid takes place. If red rays are withheld from the leaf the plant is no longer able to increase its weight, but is reduced to consuming its own reserves previously stored up; and so, gradually exhausting itself, it at length dies. This part of the spectrum, however, although necessary, is not sufficient. Plants can, no doubt, live for a long time behind red glass, but they become under such conditions extremely elongated (or, as gardeners would say, grow "spindly") and pale in color. This is due to the absence of the blue violet rays. So we find, then, that each region of the spectrum contains parts that play an active rôle in the life of plants.

Let us now turn to M. Young's recent experiments on animals, and which we find noticed in the current number of *La Nature*. This gentleman's observations, made in the laboratory of Roscoff, and extending over a period of three years, have had for their object to discover the effect of the different colors of the spectrum on the development of the eggs of the common edible frog, of the trout, and of the fresh water snail. He found that violet light favored the development to a remarkable degree; that blue light comes next in this respect; and is followed by yellow light and white light (these two giving nearly similar results). On the contrary, red and green were found to be positively injurious, for it was impossible to make the eggs develop completely in these two colors. Darkness does not prevent development, but, contrary to what has been affirmed by some, retards it. Tadpoles of the same size, and subjected to the same physical conditions previous to experiment, died more quickly of inanition when deprived of food in violet and blue rays than in the others, because life was more active therein, and consequently the expenditure of life force was greater. In was in the green and red lights that animals were found to live longest.

NEW INSTRUMENT TO DETERMINE THE PRESENCE OF METALS IN ORES.

At a recent meeting of the Philadelphia Academy of Natural Sciences, Professor George A. Koenig, of the University of Pennsylvania, exhibited his recently invented "chromometer," an instrument designed for the purpose of making exquisitely delicate determinations of the presence of certain metals in ores. It is based upon the optical fact that complementary colors will extinguish each other if mingled in proper proportions; for instance, if to a green solution a red solution be added, the liquid, if the proper conditions be complied with, will become colorless. The speaker had applied this principle to the colors which certain metals, as iron, manganese, copper, etc., produce when fused with borax, which is the only chemical used in this method of analysis. He prepares such glasses or beads containing known quantities of a metal in one hundred parts, and observes how thick a glass of the complementary color must be to produce extinction. To accomplish this the instrument is furnished with a glass wedge of a green or red color, cut at an angle of about one degree. By moving this wedge before the glass bead, with the help of a suitable rack movement, a scale moves at the same time, and when the point of extinction of color is arrived at, the reading of the scale refers to a table showing the percentage of metal contained in the examined substance. By this method of analysis a correct determination of manganese in an iron ore can be made in fifteen minutes, which is not more than one third the time required by the usual methods of analysis.

Mr. Edward Goldsmith exhibited a specimen of asphaltum found sixteen feet below the surface in a bed of cretaceous marl near Vincenttown, N. J. In the same bed and within a few feet of the asphaltum was found a yellow mineral resin of the nature of krantzite (first described by Bergeman as occurring at Nienberg, Germany), a species of amber, and containing small white crystals, believed to be succinellinite. This is the first time that either of these minerals has been found in New Jersey.

The Bradley Jig tried on Bituminous Coal.

It is well known that a machine was wanted to thoroughly wash and clean bituminous coal, and at the same time take out the slate and sulphur. No good coke can be made of stock in which is slate, dirt, or pyrites. Many efforts have been made to effect this, and the great development of the iron interests in the bituminous coal regions of the South and West has made good pure coke a necessity. The owners of the Bradley Coal and Ore Jig, which has been so successfully introduced into the anthracite coal regions (where it has entirely changed the old methods of cleaning coal) have lately tried their machines on bituminous coal with the best results, producing good work with a small expenditure of power and a limited quantity of water. Those who need a machine to thoroughly wash and clean fine bituminous coal may obtain full information by addressing Howell Green, Superintendent, Jeansville, Luzerne County, Pa.

The Scientific American Catalogue for 1879.

We now have ready for delivery a catalogue of many of the important papers published in our SUPPLEMENT for some time past. These papers are by eminent writers in all the various departments of science. News agents and others who desire copies of this catalogue can obtain the same free by addressing the publishers, Munn & Co., 37 Park Row, New York.

Louisiana Rock Salt.

The Maryland Academy of Sciences has received a large block of very pure rock salt from the island of Petit Anse. The island comprises a tract of 2,000 acres, near the Gulf of Mexico, rising out of a salt marsh to a height of 170 feet. The shallowness of the approach to the island requires the construction of a causeway to deep water before this remarkable salt mine, which has been opened into the pure salt rock to a depth of 60 feet, can be economically worked. The quantity of underlying salt is estimated as at least 15,000,000 tons. This is, however, but guesswork, but the quality of the salt is shown by analysis to be 99 66-100 of purity, the best Liverpool salt testing but about 98 per cent pure.

THE gas wells of East Liverpool, Ohio, it is said, furnish a continual supply of light and heat to the town, and as the gas costs nothing the street lamps are never extinguished. It is used almost exclusively for fuel, being conducted into the grates and stoves by pipes. For twenty years this has been going on, and there are no indications that the supply of gas is giving out.