GOLD FROM THE SEA.

The lust for gold has always been a marked characteristic of the human race, and in the nineteenth century it has been greatly aggravated by the discoveries of gold in California, Australia, Africa, and in the Klondike. Besides the men who bravely battle for gold in the mining camps there are others, fortunately very few in number, who aim to arrive at affluence by an easy path. It is strange that in the present century, with all our scientific knowledge, there are those who still cling to the old belief of the alchemist that they can transmute a base metal into gold, and in their endeavor they waste their lives, their substance, and even the substance of credulous friends. There are still others who spend their time in imposing bogus experiments on gullible dupes who allow themselves to invest their money in the most crack-brained schemes.

We have now to relate the most extraordinary story connected with the production of gold, which should be a warning to all who do not see in such affairs the specious combination of science and the wily swindler. We refer to the Electrolytic Marine Salts Company, which has recently attempted to extract gold from the sea, though the resulting gold in reality came from the pockets of the shareholders. The sensational débacle of the principal promoters of the company has produced considerable comment.

In 1872 Sonstadt discovered the minute presence of gold in sea water, and this was confirmed by Prof. Liversidge, of the University of Sydney, who found that in the sea water of New South Wales there was from one-half to one grain of gold to one ton of sea water, or 130 to 260 tons per cubic mile. Prof. Liversidge estimated the bulk of the oceans of the world as 308,710,679 cubic miles, and if each ton of sea water produced one grain of gold the aggregate amount would be $48,000,000,000,000, being 23·22 grains fine to the dollar. After this discovery, it is, of course, natural that scientists should have made attempts to secure the precious metal, by treating the sea water chemically and electrically, but it was soon discovered that such processes would be wholly impracticable, owing to the great expense attending the extraction of the gold from the enormous bulk of liquid. The matter should have ended here, but it got to be pretty well understood by the public that sea water contained gold. This fact afforded an ideal chance for the alleged inventor to devise a process for extracting the gold. A few months ago the Electrolytic Marine Salts Company was formed, and the good people of New England were asked to become shareholders, and soon nearly $1,000,000 of the $10,000,000 capital stock was subscribed. The enterprise belongs to the class which depends for success upon a secret process, which is in itself often a suspicious circumstance. Moreover, the men who devised the scheme for the extraction of the gold did not belong to the class from whom we are wont to expect great things in processes which require scientific attainments. Experiments were conducted near Providence, and a New York daily paper has been enabled to give a full outline of the ingenious trick. The capitalists were allowed to see the workings of the alleged invention. They were taken to a shed built on an old dock, and they were allowed to bring their own mercury and put it into the submarine tank, which was brought up to the surface by a winch. After the tank was properly arranged, it was lowered to the bottom and the current was turned on, and the investors sat around to await results. A diver, who has now fled the country, walked on the bottom of the sea at this point and substituted mercury specially prepared with gold for the mercury which the gentlemen had furnished. When the tank was brought up to the surface, the mercury was given to an assayer and $4.50 worth of gold was found, which was considered a very good sum for a single "accumulator." Capital now came easy after this; so that a large plant was erected at North Lubec, Me., so as to get "fresh" sea water. One plant had 240 accumulators at work. They are so located that the tide water passes through them and it is treated with chemicals and electricity, that never-failing aid to bolster up secret processes. It was claimed that gold and silver, one part of the former to two of the latter, were extracted from the water and that these metals were removed from time to time about once a week. It was held as a theory that a ton of sea water contained four cents worth of gold. It was claimed as a practice by the company that four mills' worth was taken from each ton of water and that each accumulator earns on an average $1 net a day. Each accumulator separated and used about twenty tons of sea water an hour for sixteen hours out of every twenty-four. It was claimed that the consumption of chemicals was very small. The machines appeared to do their work miraculously well, and each week a gold brick worth nearly $2.000 was sent to the city. The weekly gold brick was about the same weight and value, which showed that the machinery was working remarkably well and that the amount of gold in the water was a constant quantity, and the sixteen consignments netted $23,000. Finally the vice-president and general manager's financial operations in New York aroused the suspicions of the banks, which led to his flight and the discovery of the swindle, and both he and his diver sailed for Europe; and the deluded members of the company, who believed that the scheme was feasible and went into the business in good faith, are now going to work the plant themselves before they decide to admit that they have been deceived by perhaps the most astonishing and picturesque swindle of modern times. The moral to be drawn from this is that persons should not invest in any electrical or chemical process which they do not understand, until they have asked the opinion of some expert and for whose opinion they can well afford to pay.

LANGUAGE OF THE EYE.

There seems to be considerable difference of opinion as to the influence of the emotions upon the pupils of the eye. That they do exert a marked effect would appear to be a common belief from the frequency with which novelists remark upon eyes "blazing with anger," "on fire with rage," and exhibit "a cold, steely look, enhanced by dilated pupils."

Sir S. Wilkes, the distinguished president of the Royal College of Physicians, after long inquiry, was unable to obtain any trustworthy information upon this subject, hence undertook a personal investigation, with the result he discovered the pupil of the eye in birds under the influence of anger became contracted.

Louis Robinson, who sums up his conclusions in a paper contributed to a recent number of Blackwood, was also led to investigate, by observing the pupils of a fox terrier, when teased beyond endurance, became greatly dilated, and that the eye-chambers reflected light in exactly the same way as those of the human when under the dilating influence of belladonna or atropine. He discovered the same phenomena extended to cats and monkeys when enraged and meditating mischief; but that, when making an attack, the pupils became suddenly contracted. He suggests, as a solution of this dual phenomenon, that when an animal is angry and face to face with a foe, but has not decided upon the most effective mode of assault, it is important the eyes should take in as much as possible of the opponent and his surroundings; but, when the actual onslaught is made, the attention of the assailant is suddenly concentrated upon some particular point of its adversary's body.

Robinson's explanation is ingenious, to say the least, but it does not explain why an enraged cat—and more rarely an angry dog—before the actual assault is made, often exhibits alternate contractions or expansions of the pupils.

That the eye is an index to the emotions is not to be doubted. The horse that rolls its eyes, exhibiting a dilated pupil and an undue proportion of sclerotic (the "white" of the eye) is always recognized as tricky and unsafe. While it is doubtful if the eyes of man "blaze" or exhibit a "fiery glint" when the possessor is enraged, there may usually be observed a change in the pupil, often considerable contraction, which in a blue or light gray eye is best described as a "steely glitter." Notably most blue, gray, and hazel eyes are capable of a most wonderful expression, but light blues ("buttermilk" or "fish" eyes) and blacks are often expressionless. Kind and mild expressions are conveyed by the eyes, are not mere figures of speech. Neither is the declaration that the eyes "are the windows of the soul and temperament" without a great measure of truth; but the more intimate relations of the organs of vision to mental conditions require more study than has yet been bestowed, and these relations in connection with mental alienation—the different forms of insanity—though long recognized as existent, strange to say have attracted little attention.

A WISE REVISION.

The navy officials are to be congratulated on their prompt determination to discard the plans for our next three battleships, and prepare altogether new designs which will embody the very latest ideas as to speed, armor, and armament. The new ships are to be of 13,000 tons displacement and not less than 18 knots speed.

We pointed out last week, when it was proposed to meet the difficulty half way by awarding the contract to the builder who would guarantee the highest speed, that the makeshift was a poor one, and that the only way to secure a higher speed, without sacrificing some other qualities in the vessels, was to increase their displacement.

On a given displacement it is only possible to do so much, and if the guns are large and numerous, the engines and boilers must weigh proportionately less. The old adage that one "cannot eat one's cake and have it" is never more true than in warship designing; if one element in a ship is abnormally heavy, the others must be just that much lighter. A ship may be all speed and guns, as in the case of the 20-knot "Sardegna," of the Italian navy, but like her she will have to give up side armor altogether; or she may be strong in guns and armor, like our "Indiana," in which case, like her, she must be content with 15·5 knots speed. The only way to increase the speed of an "Indiana" without reducing her armor and armament is to increase her size by a thousand or fifteen hundred tons, alotting the increased displacement to more powerful motive power and coal bunker space.

The minimum speed of the new battleships is to be raised from 15 knots to 18 knots. To be convinced how impossible it would be for any contractor to have done this on a given displacement is evident when it is borne in mind that the resistance of a vessel, and therefore the horse power required to drive her, increases practically as the cube of her speed. If the horse power for 15 knots is say 9,000, to drive the same ship at 18 knots would require 15,600 horse power. But to install this would require heavier engines and boilers and a larger coal supply, and therefore that much larger displacement and greater bulk of ship. But the larger ship would mean more surface to be covered with armor and hence still greater displacement. Following out this line of thought, we can easily understand how the latest 18¾-knot battleships for the British navy, with their big coal supply and large stores for distant voyages, require a displacement of 15,000 tons to accommodate all the requirements.

Our new ships are also to contain no wood, whether in decks or fittings, that is not fireproofed. In view of the Santiago conflagrations, the wisdom of this decision calls for no comment. It is also probable that our future ships will be sheathed with wood and coppered, a change which, in its way, is of scarcely less importance. A sheathed and coppered vessel can remain at sea without docking when an unsheathed vessel would have to make for the nearest dry dock to be scraped and painted.

The changes proposed by the Secretary of the Navy and acquiesced in by the Board of Construction will increase the value of the three new battleships immeasurably, and with their high speed, powerful batteries, and ability to keep at sea for lengthy periods they will be well up in the front rank at the time when they go into commission, which was more than could be said of the discarded designs for 15-knot vessels.

EXTENSION OF PNEUMATIC MAIL TUBES TO BROOKLYN.

On August 1 the formal opening took place at the Brooklyn Post Office of the new mail pneumatic tube, eight inches interior diameter and one and sixty-three one-hundredths miles long, connecting the Brooklyn Post Office, via the Brooklyn Bridge, with the General Post Office in City Hall Park, this city. There were about two hundred representative business men present, and brief speech making as to the value in the saving of time in the transmission of letters was indulged in. Then Postmaster Wilson sent the first official carrier through the tube, in which was placed the names of all the guests present.

It was opened and the list read at the New York office, the carrier again replaced in the tube and returned to Brooklyn, the trip over and back occupying six minutes and two seconds. The average time of the carrier in making the trip one way is two minutes and thirty-five seconds.

The tube is to be used only for the transmission of first-class matter. Each carrier holds four hundred and fifty letters, and it is expected the capacity of the tube will be sufficient to carry at least twenty per cent of the mail matter that daily passes between the two cities. The dispatching and receiving mechanism used at each end of the tube is the same as that illustrated in the SCIENTIFIC AMERICAN of December 11, 1897. The tube was constructed by Belden & Company, contractors, for the Tubular Dispatch Company, which is to receive from the United States government a rental of $14,000 per year. The tubes connecting the Grand Central Branch office, near Forty-second Street, and the intermediate branch offices and the General Post Office, have operated very satisfactorily, and greatly expedited the mail service.

It is to be hoped these tubes may be extended in other directions, that a larger area of the city may thereby be benefited by more prompt service.

PREVENTION OF COLLISIONS AT SEA.

Referring to the subject of the use of the thermopile in the prevention of collisions at sea in fogs, as described in the SCIENTIFIC AMERICAN and SUPPLEMENT of August 6, 1898, Mr. Hermann Herberts wishes to say further:

"It was not particularly pointed out that a source of heat may be employed, and its radiations be projected by suitable means into the thermopiles for the purpose stated. This being so self-evident, in view of what has been said, that I did not point it out directly.

"My particular aim was to establish an entire independency of any vessel from the others. If attained, it would, of course, be the ideal solution of the problem.

"However, to what a distance the heat radiations, emanating, for instance, from a sailing vessel, may be transmitted, and how much of their effects on the thermopile would be lost, due to absorption on a foggy atmosphere, experiment will tell. Should such effect be not sufficiently strong enough to actuate the apparatus at safe distance, then, of course, the projecting of radiations from a stronger source may be employed."