sparingly soluble in water, it is not removed by the necessary washing, and gives to the redissolved pellicle a fine yellow color, which altogether prevents the necessity for backing of any kind.

We may add that we experienced some difficulty at first in removing the yellow appearance from the developed plates, but ultimately it yielded readily to a wash with methylated spirit. Our experiments have not been sufficiently extended to warrant any very strong statement as to the superiority of curcumin over other organifiers; but from what we have seen, we believe that it will be found in every way a most important addition to the *matériel* of the emulsion worker.—*British Journal of Photography.*

## Correspondence.

### Penguins.

*To the Editor of the Scientific American:*

I notice in your issue of January 29, an illustrated article on penguins, which calls to mind a little incident which occurred three years ago, in the South: A boat's crew and myself went fishing off Goff's Island, in the South Atlantic; on nearing the shore, we saw what appeared to be six or seven persons on a rock, and from their gestures they seemed to be hailing us. Supposing them to be the survivors of some ill-fated vessel, we rowed down to them and found they were penguins, who stood there, nodding their heads and flapping their fins, as if enjoying the trick they had played on us. We soon after went on shore at another part of the island, and there found the birds in large numbers, so thick in fact that they could be kicked over.

We also found great numbers of their eggs, which they lay in the sand, and we secured a large quantity of these and carried them aboard the ship. We also went on shore at Kerguelen's Island (the subject of your illustration) and there one of the sailors had his hands badly bitten, in trying to catch one alive. At the Crozetts, we again met the penguin family; and here several of the seamen brought them aboard, ate the flesh, and made pillows of the feathers. I made a cap of the skin of one, which lasted for a long time, the feathers making it waterproof. The birds are seen in great numbers at sea, and old sailors take warning of a gale by their quack.

But a more beatiful bird is found in the Southern Oceans. It is the albatross, the king of sea fowl. It seldom if ever goes on shore. I have seen hundreds of them, in schools, riding gracefully over the waves, and I succeeded in catching one by baiting a shark hook with a piece of pork. The bird measured 7 feet 8 inches between the tips of his wings. We made tobacco pouches of the skins of his feet, and pipe stems of the small bones of the legs and wings; and the skin was to be made into a muff, as, after pulling out the large feathers, a long heavy down is left, making it very desirable as a substitute for fur. The bill is long and crooked, similar to that of the eagle; and when hungry, the bird will devour food at an alarming rate.

The albatross can be found in immense numbers, and I have often wondered why it would not pay for capitalists to send out vessels to secure these birds for their feathers.

Pittsfield, Mass. W. E. DAY.

## NEW PHOSPHIDES OF SILVER, AND A METHOD OF ESTIMATING SILVER QUANTITATIVELY BY MEANS OF PHOSPHORUS.

BY WILLIAM FALKE, PROFESSOR OF NATURAL AND PHYSICAL SCIENCES IN MANHATTAN COLLEGE.*

In the fall of 1873, the author's attention was attracted to the action of phosphorus upon the salts of silver, in particular the nitrate. If reference be made to most treatises on chemistry, it will be found therein stated that phosphorus is a powerful reducing or deoxidizing agent, and that by introducing a stick or clean piece of phosphorus into many metallic solutions, as, for example, copper sulphate, silver nitrate, or gold chloride, the metals are separated or reduced from their combinations, and are deposited upon the suspended phosphorus in the metallic state : at first such a fine film forming upon the phosphorus as to be transparent. Gold under these circumstances, appears beautifully green on viewing it by transmitted light, which color is characteristic of this metal, and by it it can be distinguished from spurious foils. Silver and copper are deposited upon the surface of the phosphorus in minute but brilliant crystals ; and by very prolonged digestion, the whole, or nearly all, of the metal may be separated from the solution. In these reactions, the phosphorus, or part of it, removes the oxygen (or chlorine) from the metallic salts, precipitates the metal, and enters itself into solution.

In studying and experimenting upon the above detailed reactions, it occurred to me to dissolve the phosphorus in some liquid before adding to the metallic solution, whereby the phosphorus would be almost instantly diffused, and would, of course, offer an immensely increased surface for chemical action. The liquid in which phosphorus is most largely soluble is carbon disulphide, which is the solvent that has been almost exclusively employed in the following experiments :

On adding such a solution of phosphorus, which should not be too concentrated, to a solution of nitrate of silver in water, a dark and sometimes iridescent film is formed, which covers to some extent the sides of the glass vessels and also incases the globules of carbon disulphide at the bottom. A copious separation of the same black substance also precipitates, almost immediately on shaking.

* A part of this article formed the subject of a paper read before the New York Academy of Sciences (late Lyceum of Natural History), December 13, 1875.

The whole of the silver is thus removed in a short time from the solution, particularly on warming and stirring. Other metallic solutions, with different metals, were thus treated, most of which were completely thrown down in a short time, as copper, gold, platinum, etc.

Here it is important to observe that the precipitates and films thus obtained consisted not only of a part of the metals, but compounds had formed—combinations of phosphorus and metal.

After the above preliminary indications of an hitherto unobserved character, minute investigations were instituted in order to determine the nature of the compounds thus formed, and to see to what use, if any, they could be put. At present this report will confine itself entirely to the investigations on silver : the other results will appear in future communications. The following proportions were employed: Silver nitrate (fused), 5 grammes (77·16 grains) ; phosphorus, 1 gramme (15·41 grains) ; carbon disulphide, 10 cubic centimeters (0·61 cubic inch) ; water, 100 cubic centimeters (6·1 cubic inches). The fused nitrate of silver is dissolved in the water (more or less) and the phosphorus is then dissolved in the disulphide of carbon, which is then poured into the silver solution ; the small vessel containing the phosphorus should be rinsed with a little carbon disulphide which should be added to the rest, as, if any phosphorus remains in the vessel, the volatile carbon disulphide would evaporate and leave some phosphorus in a finely divided state behind which may ignite or burn spontaneously when dry in the air. The mixture is then stirred in the cold, and allowed to stand for some hours until all the silver has been removed or separated, which can be determined by taking a drop out with a glass rod and touching it with a drop of hydrochloric acid or a chloride, until no longer a white curdy precipitate or opalescence of chloride of silver appears.

Immediately on mixing the above solutions, the silver begins to separate in films and in powder, which appears highly crystalline in part, and which is combined with phosphorus. When the reaction is complete, the liquid is poured off from the precipitate, and the latter washed two or three times with water by decantation, then with some strong alcohol to remove the water, and lastly with carbon disulphide to remove excess or free phosphorus, which is not in combination and must be removed.

The above is a brief description of the method employed whereby the black phosphide of silver was prepared and carefully purified from any free phosphorus. I was greatly surprised when the above compound suddenly took fire spontaneously while drying on the filter in the cold upon the funnel. A second portion was prepared with the utmost care, and washed at last with carbon disulphide until some drops of the filtrate could be evaporated from paper without becoming luminous in the dark, proving that all free phosphorus had been removed from the compound. The second time, I again had the opportunity to behold my fugitive black substance undergoing combustion, leaving metallic silver behind. The case was evident: the new phosphide was a pyrophorus, and burned spontaneously when dry in the air or in contact with oxygen.

In order to preserve some of the new phosphide in the dry state for examination, it was introduced into a tube or small flask while yet moist, and closely stopped with a rubber stopper through which two small glass tubes passed, one for the purpose of passing into the flask a dry current of carbonic acid gas and the other as the exit tube.

The flask with the moist phosphide is then placed over a water bath heated to boiling, and a steady current of the dry gas passed over it, which soon dries by the moisture being carried off by the warm gas through the exit tube. If a much higher heat than that of a water bath be employed, say a direct application of the flame from a Bunsen's burner (melting point of tin), the whole of the compound will be decomposed, and silver remain behind, presenting a beautiful spongy appearance, while the phosphorus is carried off with the current of hot gas, which is decidedly luminous as it escapes into the air and oxidizes. If the compound is dried without too great an application of heat, and is afterwards poured out into the air upon a plate, it takes fire, and leaves metallic silver with a little phosphoric acid behind, which latter can be removed by washing with some warm water. It was with the greatest difficulty that the molecular formula of this phosphide of silver was determined ; it seems to be $AgP$. Its molecular weight is 139. The affinity of silver for the nitrogen-phosphorus group is very feeble, as this compound, among others, plainly shows.

The action of nitric acid on the black phosphide led to a series of highly interesting observations, whereby several new and definite phosphides were obtained. On adding nitric acid (concentrated) in the cold to some of the moist black phosphide, which is generally mixed with some metallic silver, chemical action is set up and red fumes are evolved, during which some of the compound is dissolved, with whatever metallic silver may be mixed with it. A precipitate remains behind, having a brick red color, which at first was supposed to be amorphous phosphorus, but proved upon examination to be another phosphide, having the composition: $Ag_2P_3$. Calculated: Silver, 69·90; phosphorus, 30·09; total, 99 99. Found: Silver, 69·44; phosphorus, 30·55; total, 99·99. This red compound is permanent in the air, and is much more stable than the first. It will be observed that, as the amount of silver increases, the stability of the silver phosphides becomes greater.

The red phosphide is soluble in concentrated boiling nitric acid, with perhaps the exception of a trace of a yellow compound which is undergoing investigation.

Other methods of operating were now employed. Instead of dissolving the nitrate of silver in water, it was acted upon in the dry way by a solution of phosphorus in carbon disulphide. Plenty of the solvent should be employed for the phosphorus; in this case, at least twenty times the weight of the phosphorus was employed.

In preparing the phosphides by adding a solution of phosphorus upon powdered dry silver nitrate, if not sufficient carbon disulphide is employed, a violent decomposition may take place. Operating thus upon a large quantity with an insufficient amount of the solvent, the writer was painfully injured by a powerful explosion, which produced a report like a blast.

A red compound is the result, that is, the particles of the dry powdered nitrate are covered by a red coating.

On treating the red precipitate with water, after pouring off the carbon disulphide, the nitrate of silver, which still remained undecomposed, is dissolved, and the reddish substance disappears, leaving a flocculent black precipitate, which was found to have the formula $Ag_3P$. Calculated: Silver, 91·26; phosphorus, 8·73; total, 99·99. Found: Silver, 91·1: phosphorus, 8·8: total, 99·9. It is permanent in the air, unless highly heated.

It is curious to note the different results obtained by acting upon silver nitrate dissolved in water by means of the phosphorus solution, by changing the conditions: thus, by acting upon a concentrated silver solution in the cold without stirring, nearly pure silver separates in films which become quite thick, as, for example, in the following proportion: Silver nitrate, 4 grammes (61·7 grains); phosphorus, 0·9 gramme (13·8 grains); carbon disulphide, 10 cubic centimeters (0 61 cubic inch); water, 30 cubic centimeters (1·83 cubic inches).

By treating a very dilute solution of the nitrate, the silver completely separates into beautiful crystals, after the lapse of twenty-four hours. Silver nitrate, 1 gramme (15·43 grains); phosphorus, 0·2 gramme (3·08 grains); carbon disulphide, 5 cubic centimeters (0·305 cubic inch); water, 500 cubic centimeters (30·5 cubic inches). By this means very pretty crystals may be separated.

### A New Cause of the Breakage of Railroad Rails.

Some interesting observations have recently been made on an Austrian railway line, which possibly may shed considerable light on the hitherto unexplained causes of the breakage of steel rails during cold weather. Cases have frequently occurred when such rails have been fractured, and yet the adjacent metal has presented no flaw to which the rupture could be traced.

The section of the Austrian road referred to is about eight miles in length, and is often blocked with snow. This obstacle is generally surmounted by strewing sand in front of the driving wheels of the locomotives and in putting on extra steam while running over the slippery section. The rails are of Bessemer and Martin steel, weighing about 62·8 lbs. to the yard. It was suggested that the sanding of the tracks caused them to heat, to be suddenly cooled again, however, by the low temperature of the air and by the falling snow. Besides the molecular construction of the metal being thus injured, there would be an extra amount of abrasion on the surface at the spots where stoppages occurred.

Examinations proved, says the *Ironmonger*, that these abraded portions varied in length from 2 to 9 English inches, $\frac{1}{12}$ to $\frac{1}{4}$ inch in depth, and extended over the whole breadth of the rail A train, in passing over the depressions so caused, necessarily experiences a certain shock; and it is reasonable to suppose that the concussion thereby communicated to the rail will be most felt when the ground beneath is frozen hard, so that the natural elasticity of the rail has no room to play. In three instances, rails so worn snapped asunder suddenly at the abraded portion, although no flaw or defect in the metal could be detected. This led to the removal of all abraded rails from this section of the line, amounting to twenty-eight lengths of Martin steel rails, and ten lengths of Bessemer rails. No similar case of fracture is known to have occurred in the iron or puddled steel rails previously in use, although the amount of abrasion they underwent must have been at least as great. The inference is that the improved rails of Bessemer and other steels, their superior strength notwithstanding, are less capable of withstanding concussion than the older rails, and consequently whenever they are used increased vigilance is requisite to prevent accidents in the winter time.

### Proposed Optical Barometer.

When a refracting prism is successively immersed in media of different refractive indices, the ultimate angular deviation of the ray will, as is well known, depend in each case on the relative indices of the glass and the medium surrounding it at the time of the experiment. And as the refractive index of atmospheric air varies with its density, the amount of deviation of the refracted ray will be a measure of the density of the air, that is, will give the means of ascertaining the reading of the barometer at the time.

If the ray of light were made to pass through a number of refracting and totally reflecting prisms, the deviation would be increased. If with these prisms a microscope were combined, the prisms might be used as a barometer. Or if the ray be received obliquely on a number of pieces of glass, having parallel faces and slightly separated from each other, although there would be no angular deviation, there would be horizontal displacement which would admit of being measured by a micrometer. How far such an application would be of practical value is certainly doubtful, as the effect of changes of temperature on the prism itself might interfere with the very limited range of the instrument. Or again, it is possible that easterly, westerly, or other currents—or perhaps differences in the hygrometric state of the atmospher

—may affect the index of refraction otherwise than by the mere changes of density which they produce. But if such be the case, the refracting prism will be useful in determining the existence and amount of such variations in the refrangibility of the atmosphere.—*Thomas Stevenson, in Nature.*

### The Case was Postponed.

A tattered memorandum book was recently found on the steps of a very humble dwelling out West. Some of the entries are as follows:

"My father had a slight misunderstanding with a neighbor about a division fence which he had inherited from my grandfather. After several disputes he consulted a lawyer, who had a good many children, but little practice. This was fatal. A suit was commenced.

"Several years ago my lawyer said I must get ready for the trial. I did so, and went to court at every term. But it was postponed on every pretence which human ingenuity could invent.

"1871. March term--Counsel for defendant moved a continuance, because he was engaged in the Court of Common Pleas. Court granted the motion, but intimated, with great dignity, that such an excuse would never avail him again.

"September term—Counsel trying a case in an adjoining county. Judge hesitated, but yielded.

"December term—Defendant ill. Proved by the certificate of a respectable physician.

"1872. March term—Counsel had made an engagement to meet a client from New York, who could not conveniently leave his business again. Continued, the Judge suggesting that New York clients might find counsel nearer home.

"1873. September term—Carried the title deeds to my lawyer. Surveyor examined the premises, said the defendant had encroached on me. But another surveyor (partner and pupil of the first one) said that my deed spoke of a hackmatack stump in the line of the fence, a foot in diameter; whereas, the only tree anywhere near the fence was a pepperidge tree, not more than seven inches and a half across; case postponed to employ other surveyors.

"December term—Counsel agreed that Court might visit the premises in dispute. Judge refused to go, but said the jury might do so, provided that nobody went with them to explain and confuse. Next morning a heavy snow fell, and boundaries were covered. Case continued.

"1874. September term—Motion to postpone on the ground that the defendant's attorney wished to be absent, hunting for a few days. Motion prevailed. I remonstrated, but my counsel said the lawyers were very accommodating gentlemen, and the courtesies of the bar required it.

"1875. March term—One of the jurors taken sick. Motion to go on with the trial with eleven jurors. Defendant's counsel objected with great strength of voice, and demanded a full jury trial, pure and simple. I think he called it the 'palladium of our liberties.' Case postponed.

"September term—Received a bill for retainers, term fees, clerks' fees, and expenses. One item was for the amount of a retainer which my lawyer had declined from the defendant. Offered him the farm, provided I gained the case. He said this would not be deemed honorable practice, but he would take it, and give me credit as far as it went.

"Took the cars for the West, coming mostly on freight trains and after nightfall.

"Mem.—Don't forget inscription for tombstone: Here lies one who died of a lawsuit bequeathed by his father."

The above, from the Hartford *Courant*, we find copied into the *Shoe and Leather Reporter*, to which the facetious editor of the latter journal adds his experience as follows:

"Lest any reader should question the genuineness of the foregoing leaf from the experience of one unfortunate victim of litigation, we feel bound to say, as a fact within our knowledge, that in all but its *denouement* it is a faithful and accurate narrative of what most people must undergo who are unlucky enough to become involved in a lawsuit. We speak feelingly on the subject, for we have been for two years knocking at the door of the Supreme Court of the State of New York, praying for judgment on a claim so obviously valid that we are utterly at a loss to conceive any tenable ground upon which it can be defended. The debtor is anxious for delay, and the excuses by which he staves off a trial have been a great deal more numerous and far less cogent than many of those which are cited above. The other day we received notice from our counsel that the trial was positively to be 'reached.' We smiled incredulously, but nevertheless performed our customary journey to the court-room, with a cartload of books and a cloud of witnesses. To our great surprise the case *was* actually 'called,' a stage of progress far ahead of any that it had previously attained, and for a moment we were cajoled into the belief that the end was approaching, of one of the chief miseries of our existence. Vain delusion! The defendant's lawyer had a case to try in another court, and ours 'went over,' the judge and counsel on both sides acquiescing with as much readiness as if they considered it a matter of course. Not the slightest consideration was given to the circumstance that a dozen witnesses or more were waiting, as they had waited many a time before. Our own advocate smiled blandly while the adverse party mentioned that he was otherwise engaged, said never a word, but took up his hat and papers and left the room, very much with the air of a man who felt that he had been practising the recognized 'courtesy' which the gentlemen of the bar are so fond of displaying towards each other, when they have clients who are able to foot the bills.

"However, we were told to keep coming until these little hindrances were got out of the way, and we did. Sure enough, after several days of expectancy, it happened that there was no other case ready, and ours really *did* begin. The jury was impaneled, and our attorney rose to commence his opening. He had not got a sentence before his alert opponent interposed some objection. Then ensued a sort of conference between the two lawyers and the judge, and t turned out, as near as we could get at it, that our counsel hadn't put in the right sort of complaint—that it was not in such form as would admit of his getting his evidence in, and that everything must be done over again. And so here we are, with nothing to show for our two years of anxiety but keen realization of the eccentricity of law and the shadow of an impending bill of costs of sufficient magnitude to convince us that our system of judicature is the dearest of all human institutions.

"It may be said that our adviser was at fault. That may be. We are not well enough versed in the tortuosities of the profession to deny or affirm it. But he is eminent in his vocation, and quite as capable, we have no doubt, of protecting the interests of a client as the average of lawyers. We see by the frequency with which suits are determined, first one way and then another, until they practically come to naught in the final tribunal, through the discovery of some technical error that had been overlooked for years by astute and watchful practitioners, what an intricate, ambiguous, and inextricable paradox the law is, and how questions that seem perfectly simple in the light of common sense become bewildering mysteries when thrown into the judicial crucible.

"But after all, our grievance is slight compared with several others by which our friends and neighbors have suffered incalculable annoyance and loss. If we were to enter into a history of the wrongs we know to have been endured through the mischances of judicial procedure, we should awaken in the minds of our readers something of the aversion with which the very name of a lawsuit inspires us."

[Many, to our knowledge have suffered, by the law's delay, similarly to our friend Bailey, and the mysterious action of counsel in conducting the cases also has been incomprehensible to the clients. But it is seldom that we have read, from the pen of the litigant, so felicitous an account of his trials as the above.—EDS.]

### Screws in Casings.

Mr. Griffiths, whose experiments with H.M.S. Bruiser we have heretofore mentioned, has been making some further trials with models at the swimming bath of the Greenwich Hospital Schools. The results which he has obtained from these latter trials are somewhat remarkable. Taking two models, representing the type of the long narrow and the short broad ship, both of the same displacement, and being respectively 5 feet long by $7\frac{1}{2}$ inches beam and 3 feet $1\frac{1}{2}$ inches long by 14 inches beam, Mr. Griffiths showed, by towing them at the ends of a cross beam, that the resistance of the water on the long one was to that on the short one as 3 to 5. On putting a pair of twin screws in the ordinary position at the stern of the long ship, and driving them for sixty seconds by means of a piece of clockwork machinery, the model was propelled through the space of 55 feet. The short vessel, however, with the screws in the same position was only propelled, with the same machinery, through the space of 28 feet in sixty seconds; but when the screws were placed inside tunnel casings with lip orifices, the model was propelled through a space of 62 feet, being, as will be seen, greater than that traversed by the long model when propelled in the ordinary manner. It was also found that, even when the screws were placed in the ordinary position in the short model, but the tunnels left open in front of them, a better speed was obtained than when the tunnels were closed, though not so good as when the screws were actually in the casings. The *Engineer* states that these results were considered of so much value by a gentleman representing the Imperial Russian Government, who was present at the trials, that, at his suggestion, Mr. Griffiths has undertaken to have a model of a circular ironclad made, and to conduct some trials therewith as to the difference of speed to be obtained by his system over that now used in the Popoffka, the circular ironclad.

### Construction of Lightning Protectors.

"Whether the point of a lightning conductor is made of platinum or of copper, or whether it is sharp-pointed, as suggested by Franklin, or presents an angle of 30° in accordance with the latest notions, however great may be the care taken in welding the metals, it is certain that in this respect the mode of construction is defective as regards conductivity, and it is to be feared that the conductivity is diminished by the action of the weather. But it appears further to be demonstrated that it is at the joint that a lightning protector is most often destroyed; it is there the discharge takes place.

"At first, Franklin proposed that the conductor should be made of one metal only. It is owing to the rapid oxidization of iron that the successive commissions have proposed to modify the nature of the extremity of the conductor. We think that it is possible to return to the original idea, since it is known how to cover iron with a metal (nickel) which forms on its surface a film perfectly protecting it from oxidization, and possessing the necessary conductivity.

"We have experimented with the conductivity of nickel spread over a rod of iron. The nickelized surface indicated a rather higher conductivity than the mass of iron; it resisted better the electric discharges given off by a powerful battery. This same rod, after being immersed in water for 10 days, did not indicate any alteration, and the electric conductivity remained the same.

"We think, then, that, in the future construction of lightning protectors, it would be expedient to do away with the copper or platinum tips, the termination being made of a single piece of nickelized iron, in the same way as the conducting rod is made.

"The lightning protector would thus become a safeguard against electric discharges, and, owing to the preservation of its point, would always possess the same protective effect.

"Again, the conductivity would remain constant, and the necessity of supervision be done away with. This last condition is of great importance, as illustrated by General Morrin. According to him, it is desirable that you should be able to verify automatically the condition of the lightning protector as regards conductivity. In fact, every one knows that, if the conductivity is defective, the lightning protector becomes a source of danger."—*E. Saint-Edmé.*

### The Practical Uses of Light.

A few days since, at the London Institution, Dr. Crookes read a paper on the radiation of light, in which he spoke of some practical applications that might be made of his discoveries. His scientific work is already well known, but these applications were for the first time laid before the public. He suggests that the torsion balance, which he has throughout used for testing the amount of action caused by the approach of light to it, should be employed as a test for the purity of our gas supply. First he would test the quality of the standard candles used, which it is known really vary very much when that variation is regarded from the standpoint of scientific accuracy. Then with the torsion balance, he would test the comparison between the gas and the standard candle, the slightest motion of the balance being capable of being recorded by the index scale on which the reflecting mirror shines. The other suggestion was the application of the rotating apparatus to meteorological purposes. He has arranged the windmill rotating wires with pith balls, so that they carry round a small magnet suspended beneath them. Their rate of rotation depends on the amount of light that falls on them.

Near the magnet attached to them is suspended another magnet, which oscillates as the attached magnet presents alternately its north and south poles. This oscillation is arranged to make and break an electric circuit, which, by a wire that may be of any length, is connected with a recording Morse machine worked by clockwork. Each revolution of the rotating pith balls is thus recorded by a punch of the Morse on a strip of continuous paper, and so a self-recording account of the amount of light falling at any place may be kept.

In our present meteorogical records, Dr. Crookes observes, we notice heat, rain, and pressure of atmosphere; but light, the most important influence, both as regards health and agriculture, is neglected, because not till now have means of measuring it been known.

### Ventilation of Ships.

The Malabar, British troopship, which recently left Portsmouth for Bombay with the 21st brigade Royal Artillery, is fitted by Messrs. Mosses & Mitchell, of London, with a couple of automatic ventilators. This new system of ventilation is reported to have answered admirably on board the Osborne royal yacht. An air receiver, 6 feet high and 22 inches in diameter, is placed on each side of the ship and connected with pipes 8 inches in diameter. These connecting pipes are filled with water, and the principle of the contrivance is simply this: When the vessel rolls at sea, the water rushes to starboard and forms a vacuum in the port receiver, into which the foul air of the ship is instantly sucked. On the return roll the water rushes to port, drives out the air, and leaves a vacuum in the same manner in the starboard receiver; and such is the extreme force with which the foul air of the ship is expelled, that it is to be used on board the Malabar for the purpose of sounding a fog horn which shall be heard a mile off.

### A Well Made Steamer.

The Great Britain steamer was one of the first made iron vessels, and among the earliest to ply regularly between New York and Liverpool. She has lately arrived at the latter port from Melbourne, Australia, thus completing her thirty-sixth trip round the world. She was designed by Brunel, and built at Bristol, and in July, 1845, made her maiden voyage from Liverpool to New York in fourteen days. Her dimensions are: Length (extreme) 330 feet, breadth 57 feet, depth 32 feet, with engines by Penn, of 500 nominal horse power.

The weight of iron used in her hull alone is 1,040 tuns, which is about equal to an average thickness of $2\frac{1}{4}$ inch. Since 1852, independent of her employment in the Crimea during 1854 and 1855, she has sailed over 1,000,000 nautical miles, her last voyage cut from Gravesend to Melbourne only occupying fifty-four days, and when recently surveyed she was pronounced to be one of the strongest vessels in the mercantile marine.

### A New Fish.

Mr. J. M. Hutchings, of Yosemite, is reported to have discovered in the head waters of Kern River, 10,500 feet above the sea, a new and beautiful fish, which he names the golden trout. It color was like that of the gold fish, but richer, and dotted with black spots a quarter of an inch in diameter, and with a black band along its sides.

A FRUITFUL source of malaria is found in the earth adjoining ponds which are dammed for manufacturing or other purposes. The soil in the vicinity, through the water being raised above its previous level, becomes soaked, and hence damp and very dangerous to health.