

SOME RECENT FACTS ABOUT COMMON POISONS.

STRYCHNINE.

According to the *Lancet*, Dr. Attilio Lelli, having met with a case in which a large dose of strychnine had been administered in coffee without fatal consequences, was led to institute a series of experiments to determine whether coffee possessed any antitoxic power against the drug. The animals employed were rabbits; and he found, by comparative trials, that a dose of 5 centigrammes (0.77 grain) proved fatal in a short space of time; when the same, in a larger dose, was given in a very strong infusion of coffee, he found that the latter acted either as a complete antidote in preventing the poisonous effects of the strychnine, or that it materially diminished the violence of its action. This is interesting, but it must be noted that the strychnine was given in coffee, no doubt good and strong. It is probable that coffee taken after poisoning with the deadly drug would have but little appreciable effect.

By means of experiments made under the direction of the British Medical Association, last year, it was conclusively proved that a fatal dose of strychnine could be neutralized by a fatal dose of chloral hydrate. A correspondent of *Nature* writes to that journal another instance confirmatory of the foregoing fact. A favorite Skye terrier having been poisoned accidentally by eating some bread spread over with "vermin killer," containing strychnine to the amount of about one sixth of a grain, he at once injected under the dog's skin forty-five grains of the chloral in solution. This quantity of chloral he estimated to be a fatal dose for the dog, inasmuch as the minimum fatal dose for a rabbit (weighing half as much as the latter) had been proved to be twenty-one grains. In a quarter of an hour, fancying the dog was dead (as the spasms had ceased and it lay apparently lifeless) he moved it with his foot, when it at once struggled to its feet and staggered off. It was then fed with some milk, and, with the exception of being quieter than usual, seemed none the worse for the ordeal it had passed through.

Dr. W. E. M. Quiston, of Atoka, Tenn., records a case of recovery from poisoning by strychnine. A young woman on September 13, 1877, took a dose of the poison to commit suicide. Ten minutes afterwards she regretted the act and asked her parents to send for a doctor. When he came he administered chloroform, which produced an immediate improvement. A strong emetic was given, and the stomach was then kept full of sweet oil, white of egg, and linseed tea, while mild inhalations of chloroform were administered as occasion seemed to demand. The result was a complete recovery within a comparatively short space of time. The action of chloroform in this case was analogous to that of chloral hydrate in the preceding notes.

ARSENIC.

R. V. Mattison, in a paper read at the Alumni meeting of the Philadelphia College of Pharmacy, claims to have fully established the question of the efficacy of dialyzed iron as an antidote for arsenical poisoning. He states that common salt should always be given to the subject immediately after the iron solution, for the purpose of precipitating the iron, in case the gastric juice should fail to be sufficient.

It has been discovered by Rouyer that freshly precipitated sesquihydrate of iron, although an antidote for arsenious acid (arsenic of the shops), fails entirely to counteract the action of arseniate of soda or arsenite of potassa (Fowler's solution), but that a mixture of a solution of the sesquichloride of iron and the oxide of magnesium will counteract the effect of these salts, as well as the arsenious acid itself, and hence this mixture is always to be preferred to the hydrate in cases of poisoning by arsenic. The official solution of the sesquichloride of iron should first be administered, and afterwards the magnesia. In one hour after the administration of the antidote, a cathartic should be given. In all cases acid drinks (such as lemonade) are to be avoided, since the compounds they form are soluble.

The poison most commonly used for criminal purposes is arsenic, its tastelessness preventing the victim recognizing it. In view of this, Dr. Jeannel, of Paris, proposes that druggists shall sell arsenic to the public only when so combined that it immediately attracts attention when added, either by accident or design, to food. For this purpose he directs attention to Grimaud's mixture, which consists of about one sixth of a grain each of sulphate of iron and cyanide of potassium to every 15 grains of arsenious acid, forming a light blue powder. On being moistened, however slightly, it becomes of a rich blue color, while the taste is so distinctly chalybeate that it is impossible to overlook its presence in any article of food.

LEAD.

A singular fact is given in the *Journal de Médecine* of the effect of the habitual use of milk in white lead works. In some French lead mills it was observed that, in a large working population, two men who drank much milk daily were not affected by lead. On the general use of milk throughout the works the occurrence of lead colic ceased. Each operator was given enough extra pay to buy a quart of milk a day. From 1868 to 1871 no cases of colic had appeared.

OPIUM.

At a recent meeting of the Medical Society of London, Dr. Milner Fothergill read an interesting case of opium poisoning which he had successfully treated with atropine. The patient, a woman forty-seven years of age, had taken a quantity of laudanum equivalent to 12 grains of opium. Dr.

Fothergill, finding her respiration falling, and her condition critical, boldly injected beneath the skin one grain of sulphate of atropia. Strong coffee and sal volatile were afterwards given, and forty-eight hours after the opium had been taken, and forty-five after the injection of the atropine, both poisons were eliminated.

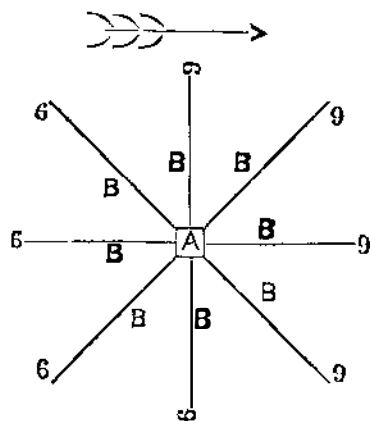
A case somewhat similar is reported by Dr. Lamadrid, of Philadelphia, in which more than $\frac{3}{4}$ of a grain of atropine was injected in divided doses. As in opium poisoning death occurs chiefly through failure of the respiration, and as atropine is the only known drug which exercises a decidedly stimulating effect on the respiratory centers, the rationale of the treatment is evident.

MUSCARIN.

Through the investigations of Dr. Lauder Brunton, in England, Professor Schiff, in Italy, and others, it has been known for some time that we have a certain antidote for the poison of toadstools (muscarin) in belladonna and stramonium, used either in the form of a tincture made from the leaves of the plants, or in that of their alkaloids, atropia and daturia. The result of some elaborate experiments of Dr. Ringer, recorded in a late number of the *Lancet*, adds another antidote to the toxic principle of toadstools in the shape of a plant known to botanists as *Duboisia myoporoides*. This plant, like belladonna and stramonium, belongs to the order *Solanaceae*, all the species of which are characterized by narcotic and poisonous properties. *Duboisia* was found to be very similar to, if not identical with, atropia; and, like it, antagonistic to the action of muscarin.

PERPETUAL MOTION.

Of the different types of self-moving machines which have engaged the attention of the believers in the possibility of perpetual motion, one form has steadily remained the favorite. It is that in which the radii or spokes of a wheel carry weights which, by hinges and stops, or in some way, are to be constantly unbalanced. Since the days of Bishop Wilkins, the Marquis of Worcester, and M. Orffyreus, this sys-



tem, with varying details, has been reinvented many thousands of times, the inventor in each case falling only just a little short of success, usually owing to some slight defect in the model. It has remained for a correspondent of the *New York World* to demonstrate mathematically the soundness of the principle, as applied in a machine invented by him. He writes that he has never made a working model, but that is not necessary, as the diagram has only to be seen to be accepted.

The arms, B B B B B B B B, radiating from the hub, A, carry weights of this peculiar shape, 9, so that the three on the right represent twenty-seven pounds, while the three on the left only amount to eighteen pounds, thus there must always be nine pounds more on the right side than on the left; the sixes on the left become nines when they pass the center, consequently the machine must move; it amounts to a mathematical demonstration, and "figures won't lie."

Hydraulic Salt Mining in Bavaria.

A correspondent of the *World* describes at great length the process of salt mining in use at Berchtesgaden, Bavaria. At this place the salt does not occur in deep rocky strata, as at the Polish mine at Wieliczka, but in a thick layer of saliferous earth in the heart of a mountain. The mine is entered by horizontal shafts, and the salt ingeniously removed by the solvent action of water working upward. At the end of each shaft a chamber is mined, and when it is large enough the entrance is dammed up and the chamber filled with fresh water through an opening at the top. The water is to dissolve out the salt from the roof of the chamber, hence it is necessary that the chamber be kept entirely full. At first the water acts also upon the bottom and sides of the chamber, but soon there is left a pasty waterproof covering of clay which prevents further action. At the top, however, the overlying earth falls away as a fine sediment as fast as the salt is dissolved, leaving always a fresh surface for the water to act upon. The falling sediment forms, under pressure, a water-tight floor to the chamber, which rises as the solution of the roof goes on, so that the chamber slowly climbs from the bottom to the top of the salt yielding stratum. The solution has to go on with the utmost quiet, and not too rapidly, or else fragments of the roof will fall to the bottom, where the water is saturated with salt, and be lost. To keep the water constantly pressing against the roof a proper supply of fresh water is continually added from above. Complete saturation of the water is effected in about three weeks, when it is pumped out and carried in pipes to

Reichenhall, twenty miles distant, for evaporation. Fresh water is then pumped into the chamber, and the process repeated until the upper limit of the salt deposit is reached. In this way the mountain is being slowly washed, and its saline treasure stolen away, without removing the clay with which it was associated. The saliferous earth removed in tunneling is refined in the usual way.

A Mouth Telegraph.

M. Mangenot has recently communicated to the French Academy of Sciences a description of a new telegraphic apparatus, to be worked by the mouth. The manipulator consists in two plates of ivory, from one of which leads the conducting wire, and from the other the ground wire. These plates are placed between the lips, and the operator talks or so moves his lips as to make a certain number of breaks and establishments of the current for each word or letter. At the other end of the line is a similar arrangement, the receiver translating the message by the sensations of his tongue.

[We translate the foregoing from a report of the proceedings of the Academy, published in several of our French contemporaries. The principle is venerable with age, and probably there is no one who has ever repaired a telegraph line that has not tested whether a current was or was not passing by touching his tongue to the wire. The same can be done on wet days with the fingers, although the sensations are not so marked. M. Mangenot appears to have invented nothing but the ivory holders for the wire, and consequently the claim which he makes for the \$10,000 Volta prize to the French Government savors considerably of profound assurance. — Eds.]

Steel Exhibits.

Messrs. Jessop & Sons, steelmakers, of Sheffield, have for exhibition at the world's show at Paris a comprehensive collection of specimens of steel in all stages of manufacture, commencing with bar steel and finishing with highly polished bayonets and knife blades. There are best cast steel, in bars ranging from 20 inches square to $\frac{1}{2}$ of an inch; similar bars in octagons, hexagons, flats, and rounds, every other bar from the 20 inch square downwards being highly polished to show the steel to be absolutely free from flaws. Then there are special kinds of tool steel in all shapes, forgings of all kinds, and circular plates for circular saws. One of these plates is no less than 10 feet 8 inches in diameter by $\frac{1}{2}$ inch, and is believed to be the largest steel plate of the kind ever shown or made. The exhibits also include a cold rolled band $4\frac{1}{2}$ inches broad by 30 gauge and 200 yards long; a hot rolled band $6\frac{1}{2}$ inches broad by 16 gauge and 120 feet long; wire rods from 300 feet long; saw, reaper, and pen sheets of all sizes, from 16 feet by 3 feet 6 inches; and several samples of severely tested plate steel. Finally there are stars formed of bayonet blades, and stars also of cutlery and scissor blades.

Physiological Treatment of Stuttering.

Very great success is reported as attending the treatment of stuttering by purely physiological training, according to the system of M. Chervin, of Paris. Three types of stuttering are distinguished: First, that occurring during inspiration; second, stuttering during expiration; third, stuttering during both these periods, and between breaths. The treatment is divided into three stages. The first involves various respiratory exercises, during which the pupil is first taught to make a long full inspiration and follow it by regular forcible expiration. Then the respiratory movements are made with various rhythms until they become full, regular, and easy, instead of being jerky, labored, and fatiguing. In the second stage of treatment, exercises with vowel sounds are substituted for the previous mute breathings, giving to each vowel the various modifications of tone, pitch, duration, etc., heard in conversation. The third stage comprises exercises on consonants, alone and in combination with vowels; at first slowly, then rapidly, varying the duration and pitch of each syllable, and passing from words of one syllable to those of two and more. Prepared by these exercises the pupil learns to articulate slowly and methodically short sentences, then longer periods and paragraphs, separating sentences and always beginning with a deep inspiration. Twenty days of this treatment usually suffice for a perfect cure.

Planetary Population.

On the interesting question of the plurality of worlds, Professor Newcomb remarks as follows: "Enthusiastic writers not only sometimes people the planets with inhabitants, but calculate the possible population by the number of square miles of surface, and throw in a liberal supply of astronomers, who scan our earth with powerful telescopes. The possibility of this it would be presumption to deny; but that it is extremely improbable, at least in the case of any one planet, may be seen by reflecting on the brevity of civilization on our globe when compared with the existence of the globe itself as a planet. The latter has probably been revolving in its orbit 10,000,000 years; man has probably existed on it less than 10,000 years; civilization, less than 4,000; telescopes, little more than 200. Had an angel visited it at intervals of 10,000 years to seek for thinking beings, he would have been disappointed a thousand times or more. Reasoning from analogy, we are led to believe that the same disappointments might await him who should now travel from planet to planet, and from system to system, on a similar search, until he had examined many thousand planets."

New Inventions.

In a new Process of Making Ice, the floor of a tank is flooded with water, which is allowed to freeze. A quantity of snow is spread upon the ice thus formed, and the surface of such layer of snow is sprinkled with water to form an icy crust thereon. Water is then admitted to cover the snow and allowed to freeze. Another layer of snow is spread upon this second body of ice; and so the operation goes on until the tank is full of alternating layers of ice and snow. The ice layers may be a foot or more in thickness, but the snow layer will be as thin as practicable. The snow layer enables the ice to be easily cut up into pieces of any required size. Patented by Mr. A. C. Call, of Algona, Iowa.

Mr. M. T. Durkin, of New York city, has invented an improved Skylight, in which the glass-supporting bar is made of sheet metal, and the cap is secured by a peculiar arrangement of clips. No putty is required, and the arrangement is neat and sufficiently strong.

Mr. W. S. Montgomery, of Marshalltown, Iowa, has invented a combined Lock Bolt and Handle, consisting of a combination of a pivoted handle and a connecting link with a sliding bolt, the handle and link being arranged so that by swinging the handle on its pivot the bolt may be moved in or out.

A combined Chair, Cot, and Crib, all in one piece of furniture, is the invention of Mr. H. C. Hayman, of Van Buren, Ark. The device is readily adjusted to perform either of these functions.

Mr. F. Goff, of Chicago, Ill., the inventor of an improvement in the Manufacture of Boots and Shoes, employs a waterproof filling composed of fine particles of cork and rubber mixed together, and applied to a boot or shoe so as to fill the space between the outer and inner sole.

An improved Clothes Line Hanger, patented by Messrs. G. S. Sayers and T. Galligan, of Hyde Park, Pa., is so constructed as to permit the line to be readily detached, and by adjusting the bearing of a pulley, by means of a screw, the slack of the rope may be taken up as required.

Mrs. M. Bowie, of Houma, La., has secured by patent the formula of a Remedy for Pneumonia, Coughs, Colds, etc., which she claims to be unusually efficient.

A new patent Bit for Horses, intended as a cure for shying and bolting, has been invented by Mr. J. H. Robinson, of Manchester Bridge, N. Y. The cross bars of the bit have points which are protected by arched springs until the side pressure forces the points to project through slots in the springs and pierce the horse's mouth. The inventor thinks that a little experience with this bit will enable a horse to be driven safely with an ordinary bit.

Mr. C. A. Kirtland, of New York city, has invented a Plate Glass Face Protector, for screening off the heat from cooking ranges, etc., while permitting the vessels on the range to be seen. The frame containing the glass is pivoted and counterbalanced in such manner as to remain stationary in any position.

An Umbrella Holder, patented by Mr. J. H. Bowers, of Cowan, Tenn., is an arrangement intended to support an umbrella and permit the free use of both hands. It consists of a belt carrying a socket in which the umbrella stick is held, and a chest strap supporting it above, in connection with a single shoulder strap.

Mr. J. Bowman, of Somerset, Ohio, has introduced a number of improvements in the Running Gear of Buggies and other vehicles, which are intended to lessen the expense of manufacture and to allow the stays to be put on and taken off without taking the gear apart.

A new Percussion Shell, invented by Mr. J. M. Urquhart, of Jefferson, Tex., is made in independent sections screwed together and connected by a fuse so as to furnish a number of successive explosions. The tapering point is also charged with powder, and has a number of anvils for caps, inclosed by an outer sheet metal case which explodes the caps on striking an object. Mr. Urquhart has also invented a hand grenade, which may be thrown from a balloon, and which is exploded in the same manner by the yielding of its sheet metal case.

Mr. E. Ridge, of Frankford, Pa., has invented an envelope for Transmitting Samples of flour, sugar, tea and other substances at third class rates through the mails in such a manner that the contents may readily be inspected by the postmaster. It has a supplementary piece gummed to it, inside, and furnishing two end flaps, one of which is sealed in mailing and the other left for resealing after examination by the postmaster.

A new Reverberatory Furnace for metallurgical operations has been invented by Mr. W. Mann, of Newcastle, Pa. It belongs to that form of reverberatory furnace in which the fuel is charged first to one compartment of the furnace, where the gases are partially driven off, and the remaining coke afterward pushed into the main fire chamber. The improvement consists in combining with an ordinary furnace a supplemental furnace and retort, arranged in front of the fire chamber, which retort opens laterally into the fire chamber, and the supplemental furnace opening also into the fire chamber through the retort, and having in the same, beneath the retort, a slow fire with little draught.

Mr. A. A. Danzig, of New York city, has obtained a patent for an improved arrangement of Underwear for Women, greatly simplifying the same.

An ingenious Trundling Toy, invented by Mr. G. W. Craig, of Baltimore, Md., consists of a hoop or wheel having a forked pendulum or bar attached to its hub, and carrying an automaton and bell, or signal, which are so applied

that they are respectively moved and sounded as the hoop revolves. A forked handle is used to direct and roll the hoop.

Mr. M. Powe, of Phillipsburg, N. J., has made improvements in the construction of the Fifth Wheels of Vehicles, by which, it is claimed, the forward end of the vehicle body will be firmly supported in any position of the fore wheels, the device being light and strong, with wide bearing surfaces, and a secure locking arrangement of the king bolt.

Mr. A. Zerban, of New York city, has originated a convenient Sample Card for exhibiting silks, jewelry, laces, etc., which permits the ready removal, exchange, or adjustment of samples, thus making it possible to rearrange the latter so as to observe the effect of new combinations and contrasts of colors and patterns.

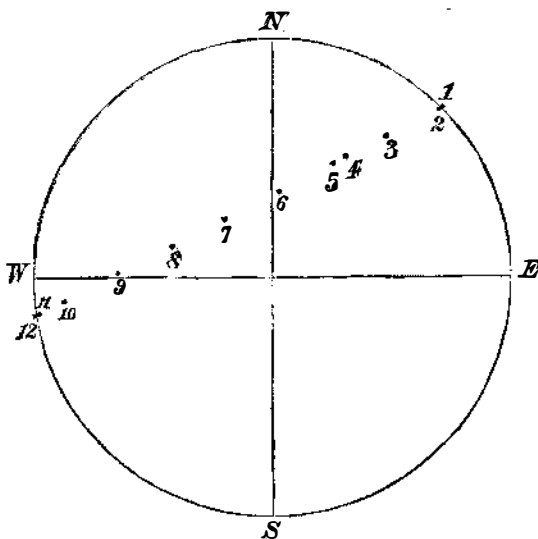
An improved Sandal, for the protection of the feet in wet weather and as a substitute for ice creepers to prevent slipping, has been invented by Miss A. M. Woodhull, of Freehold, N. J. The sole is made of wood, cork, or leather, and has on its under side a piece of rubber which keeps the moisture of the ground from the foot. The sandal is held in position by a toe tip, a strap buckled over the instep, and a wire loop around the heel.

In a new Railway Switch, invented by Mr. R. Gray, of Bloomington, Ill., the improvement consists chiefly in attaching the ends of the switch rails to the ties or sleepers, leaving the body of the rails free or movable and in combining with them a device by which they can be bent or sprung laterally, in order to cause, by centrifugal action, a train of cars to continue on the main line or pass to the side track, as may be desired. Suitable means are provided for operating the switch rails and locking them in either position, which result is effected by an ordinary switch lever, or through the medium of devices attached to the locomotive. The invention further consists in combining the flexible switch rails, fixed at their ends only with tapered and fixed side and main track rails, which are preferably extended past the ends of the switch rails.

OBSERVATIONS ON THE TRANSIT OF MERCURY OF MAY 6, 1878.

MADE BY J. WALTER WOOD AND ALFRED M. MAYER, On the slope of South Orange Mountain, opposite Montrose, N. J.

These observations were made by projecting the image of the sun on a screen carried by a light frame attached to the eyepiece of the telescope. On the screen were drawn



POSITIONS OF MERCURY DURING THE TRANSIT.

two lines at right angles and parallel to the edges of the board. Around the intersection of these lines was drawn a circle of 3 1/4 inches in diameter. The image of the sun exactly fitted this diameter. The aperture of the telescope is 3 inches.

Before each observation a level was placed on the upper edge of the screen, and thus one of the lines on the screen was made truly vertical. Of course, at apparent noon this vertical line and the meridian hour circle were coincident. The point of first contact on the circle was determined in reference to the vertical drawn across the circle, and this place was marked. The top edge of the screen was leveled two minutes before the expected time of contact.

The accompanying figure shows the position of Mercury, marked 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. Number 1 is first contact, 2 is second contact, 11 is third, and 12 is fourth contact. The New York time of the positions of Mercury corresponding to the above numbered loci is as follows, according to our observations:

1	.....10h.	17m.	12sec.
2	.....10h.	19m.	35sec.
3	.....11h.	17m.	00sec.
4	.....12h.	5m.	04sec.
5	.....12h.	17m.	00sec.
6	.....1h.	17m.	00sec.
7	.....2h.	17m.	00sec.
8	.....3h.	17m.	00sec.
9	.....4h.	17m.	00sec.
10	.....5h.	17m.	00sec.
11	.....5h.	46m.	03sec.
12	.....5h.	48m.	12sec.

As the line N S was always vertical it followed that the

north point of the sun was in a different position in reference to the line N S at successive observations. These various positions of Mercury in reference to the vertical were, after the transit, reduced in reference to the N and S points on the sun, and in that manner the path and positions of Mercury were obtained in the accompanying figure.

About the middle of the transit we took off the screen, and looked at the limb of the sun through the ocular and a colored glass (London fog). The limb of the sun was brought to a sharp focus. On bringing Mercury into the center of the field he appeared with a hazy border, and we did not succeed by any adjustment in getting a sharp definition. This would seem to indicate an atmosphere surrounding the planet.

The size of Mercury was determined by drawing a series of small circles till one was made which exactly contained the disk of the planet. We thus found that the diameter of Mercury was 1/150 of that of the sun.

The Mississippi Jetties.

A report is going the rounds of the press that Captain Eads has asked to be released from his engagement to create a channel of thirty feet through the jetties, and has abandoned the undertaking as a failure. This report rose from the fact that the Captain is now in Washington advising that a modification of the plan be made, which will not require the 30 foot channel to be more than 100 feet in width. With such width, the 24 foot channel would probably be not less than 400 feet wide, and the 22 foot channel about 500 feet. The act under which Captain Eads is operating requires a channel nowhere less than 30 feet deep for a width of 350 feet, and it is thought that to create such a width of 30 feet water between the jetties will be injudicious and tend to injure them. Captain Eads expressed this to the committee when the original bill was being drawn, and he is confirmed in his opinion by observation at the jetties, and therefore proposes the modification referred to above. As an increase of the flow into the pass can be readily obtained, not one tenth of the whole discharge being used, it remains entirely for the government to say whether the stipulated size shall be adhered to or not. There is now a depth of 23 1/2 feet in the whole length of the channel, and in one part a hollow of 80 feet in depth has been created by the current through the jetties. By the terms of the law the contractor has until September of next year to create a channel of 24 feet deep, but so fast has the work advanced that it is probable that a channel 250 feet wide, of a depth of 24 feet, will be obtained during this month, as but 3,740 cubic yards of material is in the way of its realization.

Captain Eads also asks for a modification of the mode of paying him for the work done. Upwards of 80 per cent of the work required to complete the jetties has been done, and less than 20 per cent of the contract price has been paid by the government. The delay in payments under the present act is so great that it is impossible to push the work as rapidly as the public interests require. The work is now so far advanced and the success so pronounced that it is for the interests of the government and the country that the work shall be pushed with the utmost vigor to such a point as shall insure the utmost efficiency of action in increasing the capacity of the channel. The board of engineers to whom the question of the modification of the terms of the act was referred approves of it, and it would certainly seem to be good policy to give Captain Eads all the facilities he needs in forwarding the work, due regard being had to the proper progress of the channel, that the money be not advanced faster than the work is performed and the permanent depth of the water assured.

Extending American Commerce.

The agitation of the subject of extending our commerce to South America has had the effect to start two lines of steamers from New York to Brazil, touching at intermediate ports, and a line will soon be put on from New York to Brazil. These lines, it is hoped, will enable us to successfully compete with the Europeans for the large and constantly increasing trade of South America. A line of steamers is also advertised from New York to the Azores, which will soon be extended to the west coast of Africa. In addition to these efforts to extend our commerce, Congress has under consideration the Watson expeditionary survey of a railroad from our colony of Liberia one or two thousand miles into the interior of Africa, with the view of opening up our trade with these populous regions; the road should be built to connect with lines of steamers running to our ports. Great Britain has now two lines of twenty large steamers to Sierra Leone, Liberia, and the west coast, and it is hoped by our railway and steamers to divert a large share of this trade to the United States. It may be objected that the people of Africa are of a much lower grade of civilization than those of South America, and that therefore their trade would be comparatively small; but it should be considered that the Africans number nearly six times as many as the inhabitants of South America, and that were there means of supplying them with our manufactures a large trade would doubtless spring up as they produce many articles which we could profitably take in exchange for our commodities. It is to be hoped also that our colony of Liberia, now increasing with considerable rapidity, will help to extend the trade with that region, and that the colony itself will be helped by the opening up of the country by the railroad and shipping, and its resultant commerce.