Correspondence.

Kerosene and Spiders.

To the Editor of the Scientific American:

Did you or any of your readers ever hear that kerosene attracted spiders? I have a large can of kerosene in a shed, and under the faucet, to catch any drops in drawing the liquid, is a tin. Repeatedly I have found this kerosene tin filled with spiders, large and small, which have been drawn to it, apparently, for they are not to be seen in the room elsewhere. I should have supposed the smell of kerosene would repel any insect, but these spiders come to the tin as if it were a trap for them, and, of course, find their death in it. K.

Newburyport, Mass.

Covering the Sun's Disk.

To the Editor of the Scientific American:

In the very interesting article on optical illusions in the SCIENTIFIC AMERICAN of May 17, 1890, quoted from Mr. Liverseege's paper before the Midland Counties Chemists' Association, England, one slight inaccuracy occurs which I beg leave to call attention to. He queries, "What is the diameter of a sphere which just hides the sun's disk at a certain distance, say ten feet? As far as I can answer the question I should say between three and four inches." Mr. Liverseege evidently had not tried the experiment, which is very easily done, taking the full moon's disk, which is substantially of the same average apparent diameter as the sun's. The problem is also one of simple calculation. The sun and moon subtend about half a degree of arc at mean distance (32 minutes). Half a degree of a circle of 10 feet radius $=\frac{2.\pi\ r}{2.360}=\frac{2.3\cdot1416.10.12}{2.360}$ $=1\cdot0472$ inches, just about the diameter of a silver quarter dollar. At arm's length—say 2½ feet—a buckshot 0·26 of an inch in diameter (about ¼ inch) fully covers the sun's or moon's disk, as any one may demonstrate by practical test. HENRY H. BATES.

U. S. Patent Office, Washington, D. C., May 23, 1890.

Submarine Navigation.

To the Editor of the Scientific American:

In your issue of May 17, which is just to hand, you have given a very interesting account of the experiments which were successfully carried out with the submarine boat Goubet. In your account you state that these experiments proved that the Goubet is able to come to a rest at any desired depth, and to maintain that position for any desired time, and you further state that it is impossible to say how this paradox is realized by the Goubet, and that it is a secret between the inventor and the government.

I do not lay claim to any knowledge of the process whereby this result is achieved by Mr. Goubet in his submarine boat, but I can easily give you a description of a process whereby the result can be produced. Nearly ten years ago I wrote a book for amusement somewhat similar to "Looking Backward," that is to say, it was supposed to be an account of a theoretical socialistic government, but I never took the trouble to have the book published. I believe the manuscript has been destroyed, but I remember that among many other inventions described in the book, I had given a description of a submarine boat which had the power of remaining at any desired depth for any length of time. The process by which this result was achieved was a very simple one, and depends on a few well known natural laws. A body that is immersed in water will have a tendency to rise if its weight is less than the weight of the water displaced, and a tendency to sink if its weight is greater than the weight of the water displaced. While water is not incompressible, yet its compressibility is so slight that the weight of a given bulk of water is practically the same at the surface of the sea and one hundred feet beneath the surface, and therefore a body that commenced to rise or fall, by reason of its weight being smaller or greater than the weight of the water displaced, would continue in the same direction for a very considerable distance.

If a body that is exactly equal in weight to the water displaced be increased in size or decreased in weight ever so slightly, it will tend to rise, and a slight decrease in size or increase in weight will tend to make it sink. While the depth of a body in water could not be determined or regulated by the infinitesimal reduction in the bulk of the water displaced, yet it can be easily controlled by the fact that the pressure of the water increases rapidly with the depth. At the surface of the sea the pressure is about 14 lb. to the square inch; at a depth of a little over thirty feet, it is 28 lb., and at 100 feet it would be about 60 lb. per square inch. A difference in depth of one foot makes a difference in pressure of about seven ounces. A delicate appliance, which could be easily made, inside the submarine boat, enabled the pressure to be shown in quarters of a pound upon a dial with a movable needle. A movable handle, sliding round the edge of the dial, had two points separated by a distance equal to a quarter of a pound division on the dial, and which were in such a position that the movable needle just touched them. Upon the needle touching one point it completed an electrical circuit, and so started a pump into operation to empty a tank, and in that way lessen the weight of the vessel. If the vessel was in almost perfect equilibrium, a few ounces of water ejected would be sufficient to start it in an upward direction. This would be immediately checked by the needle on the dial breaking that circuit, and completing another by touching the other point, so stopping the pump and opening a small aperture for the admission of water into the tank. The vessel would therefore continually rise and fall automatically through a distance of not more than a foot or eighteen inches at most. By means of the sliding handle the depth could be immediately altered to any desired extent, and the movable needle would then keep the vessel automatically at that depth as long as desired.

Instead of the completion of the circuit on the dial causing the admittance of water to sink the vessel, or the operation of the pumps to raise it, on the principle of increasing or decreasing the weight of the vessel, a similar result could be produced by decreasing or increasing its size. A cylinder with one end open to the water, and with a piston strictly water-tight sliding in it, worked by an electrical machine, would produce the same result. Drawing the piston back a few inches would decrease the size while maintaining the weight, and the vessel would therefore sink; while forcing the piston out a few inches would increase the size, and so make the weight of the water displaced greater than the weight of the vessel, and would, therefore, cause it to rise. The dial would keep the piston moving slightly backward and forward, and therefore keep the vessel within very narrow limits of the desired depth. This may or may not be the method employed by Mr. Goubet for maintaining his submarine boat at any desired depth, but it certainly is simple, practicable, and sure. HAROLD ROWNTREE.

Westport, Mo.

Lassar's Treatment of Baldness.

The treatment recommended by Lassar, of Berlin, for alopecia pityrodes and alopecia areata has been attended with some brilliant results. According to Dr. Graetzer's article in the *Therapeutische Monatschrift*, but few cases resist the treatment, and after a few applications the downy sprouts may be seen. The following procedure is to be repeated daily:

1. The scalp should be lathered well with a strong tar soap for ten minutes.

2. This lather is to be removed with lukewarm water, followed by colder water in abundance; then the scalp is to be dried.

3. A solution of bichloride of mercury, 1 to 900, the menstruum being equal parts of water, glycerine, and cologne or alcohol, is to be rubbed on.

4. The scalp is then rubbed dry with a solution containing beta-naphthol, 1 part, and absolute alcohol, 200 parts.

5. The final step in the process is an anointing of the scalp with an unguent containing 2 parts of salicylic acid, 3 parts of tincture of benzoin, and 100 parts of neatsfoot oil.

This treatment should be persisted in for a period of six weeks or longer. Lassar, who, by the way, is the secretary-general to the International Congress of this year, has done much to awaken the profession from the lethargic state into which it had fallen in regard to the treatment of alopecia. He is reported to have treated a thousand cases in the manner described.—*N. Y. Med. Jour.*

A Collision with an Iceberg.

The Beacon Light, an English steamship for carrying oil in bulk between Liverpool and New York, recently arrived here in a somewhat damaged condition, having been in contact with an iceberg.

The Beacon Light was a new vessel just off the stocks when she sailed. She was built for the oil trade, and had, among other improvements, a large electric light for the purpose of searching in fog. The voyage was a favorable one until the evening of May 12, when it became foggy. At midnight, when the watches were changed, the temperature of the water was found to be 54 deg. This did not indicate the presence of ice in the vicinity, but, as the fog had grown denser, Capt. Elliott ordered the engines to be slowed down.

Twenty minutes after midnight the lookout sprang down upon the deck and cried out: "There's something white ahead!"

The captain hurriedly telegraphed to the engineer to reverse the engines. The helm was put hard to starboard. The ship had answered her helm, and began to swing her head quickly around to port. Then came a shock and a crash, and the terrified sailors saw a great avalanche of broken ice tumbling down upon the forecastle head and pouring over upon the forward deck. The bluff of the steamer's bow had struck the foot of the ledge. It was a glancing blow, and threw the Beacon Light fairly over upon her beam ends. Great masses of ice, which had been knocked from the ledge, fell into the ocean, and, after sinking a short distance, came up rapidly and dealt telling blows upon the side and bottom of the vessel.

The ship remained on her beam ends but a moment, and then quickly righted. She now began to feel the effects of her reversed engines and backed slowly away from the iceberg, on which the searcher was still pouring its light and which appeared about six hundred feet long and ninety feet high at the peaks. The captain found that the vessel was not sinking, although she had evidently sprang a leak. The air was heard escaping from one of the tank compartments of the hold which had been empty, and he immediately had all of the cocks of the tanks shut and the plugs screwed in. The pumps were started, and it was found that these got rid of the water much faster than it poured into the hold, Captain Elliott was satisfied that the vessel was still seaworthy and proceeded on his course.

The Beacon Light was built in the yard of Sir William Armstrong & Co., at Newcastle, and registers 2,107 tons. Her dimensions are: Length, 332 feet; breadth of beam, 40 feet; and depth of hold, 28 feet. She can make thirteen knots an hour at a comparatively small outlay of coal.

Grapes for Raisins.

The California raisin industry is one of our most profitable, promising, and rapidly extending specialties. Not only so, but the raisin is winning wide reputation for our State in distant parts, and our raisin districts, especially in the San Joaquin valley, are enjoying a good share of the influx of population. A single branch of production which made an outturn last year of one and a quarter million 20 pound boxes, or in round numbers 25,000,000 pounds of dried fruit, and which bids fair to increase this amount this year, possibly 33 per cent, is naturally attracting much attention. This interest is also stimulated, no doubt, by the fact that in spite of this production and the foreign product as well, there is this year a great shortage in the world's supply of raisins. The outlook is that those who have been planting raisins so resolutely and confidently during the last few years will find themselves luxuriating in generous returns this year if no unfavorable influence prevents the realization of present crop promise.

In winter are seen the vines in their regular rows correctly aligned from any point of view. The foliage has fallen, the canes have been pruned back to a few buds, and nothing appears to the casual observer but gnarly stumps with crests of pronged spurs, the old bark black, ragged, and uninviting, the ground covered with rubbish of dead leaves and brush and clods. Such is the aspect of a vineyard until the winter rains start the growth of verdure along the rows, then follow the plowing and harrowing, or cultivating, and the sorry vine stumps are surrounded by an even surface of well pulverized soil; soon the vine feels the warmth of the spring sunshine, the foliage starts, the gnarly, spurred head of the vine is hidden beneath a tuft of crisp, delicate leaves; then, if frosts forbear, out shoot the canes with twining tendrils, the vine stump is lost to sight, the field becomes an expanse of beautiful green mounds. Back and forth go the cultivators, each time the pathway of brown soil becoming narrower, until at last vine links tendrils with vine, and the field is a sea of green; vine stump, brown soil, everything is concealed beneath the dense mantle of verdure. Such is the California vineyard at midsummer. In young vineyards there will be protruding stakes and bare patches of soil, but in the old vineyards there is neither sign of stake nor trellis. The vine pruned to support its own weight, except such as it can distribute over the surrounding soil, needs no support. There is nothing handsomer in the midsummer landscape than the green of the vineyard contrasting with the browns and yellows of the grain fields or the unimproved hillsides. Orchards are green as well, but the vine has a density of foliage and a uniform verdure which can be selected as far as the eye can perceive.

As the summer shades into autumn, the scenes in the vineyard change. The heavy clusters of ripe grapes are gathered, spread upon wooden trays, and exposed to the clear sunshine and warm dry night air of the interior valleys of California. As the available space between the vines does not always accommodate the fruit, all surrounding spaces are employed. The avenues around the vines are spread with trays, and the banks of the irrigation ditch are also covered.—*Min. and Sci. Press.*

Artificial Gutta-Percha.

Dr. Purcell Taylor, of London, claims to have succeeded in making a new insulating material, having all the properties of gutta-percha, but with a higher dielectric resistance. The new substance, which is to be called "purcellite," is, according to the writer, very tough and elastic. A piece of iron covered with it, he states, was hammered out flat, then bent and twisted until it broke, without even cracking the covering. The cost, it is added, is only about 1-40 that of gutta-percha. It may be made any color, and either flexible or rigid.