Correspondence.

A Pretty Experiment with a Diamond Ring.

To the Editor of the Scientific American:

A diamond, however small, will reflect an object or a landscape, and show to the eye a brilliant and perfect picture.

To illustrate this the operator must place himself with his back to the object to be reflected, and raise the hand containing a diamond ring so that the stone is close to the eye, and opposite the object. Close the eye not in use, and move the diamond closer to or further away from the eye, to bring the picture to a sharp focus.

By this means it is possible for a person to sit in a room with his back to the company and see all that is going on. ARTHUR S. GREEN, photographer.

Frankford, Pa.

To the Editor of the Scientific American:

So many persons have given their way of cutting off glass bottles, and as I have a way I think far ahead of any I have seen mentioned in your paper, I will explain, as it may be of some interest to your readers.

I take a piece of large wire and bend it in a circle to fit around the bottle, leaving the two ends of wire projecting an inch or two. This wire I clamp around the bottle by tying a cord around the ends of the wire. Then with an ordinary glass cutter I follow the clamp all around. Then remove the clamp and tie a soft cord around the bottle at the cut; saturate it with coal oil. When the oil has about burned off plunge the bottle in water. I have never failed to cut the thickest bottle perfectly smooth. CHARLES HUGHES.

Red Bluff, Cal., May 13, 1891.

To the Editor of the Scientific American:

It seems to me that the *Electrical Engineer* doesn't draw the right moral in what it has to say of "Telephoning in French," page 291. It is this: When telephoning in French, use plain English. It is the world language.

In your article on "A Hanging Garden and a Model Office Building," a slight error occurs. The architects were not Townsend & Mix, but Townsend Mix & Co., of Milwaukee and Minneapolis. Mr. Mix died lately. The "Co." is Mr. W. A. Holbrook, who lives in Milwaukee. I have often admired that Minneapolis pile and regret that none of the magnificent buildings contemplated in Milwaukee seem to include the peculiar features which make the Guarantee Loan Building justly celebrated. W. K. FRICK.

381 21st Street, Milwaukee, May 9, 1891.

To the Editor of the Scientific American:

I send you a few pieces of cracking coal, with reference to Mr. Geo. M. Turner's article on cutting glass in your issue of April 18, page 245.

At the first glance you see that its use (which I described in your issue of October 4, 1890, page 213) is quite the same as the use of a red hot poker or a small gas flame, with the only difference that it is not so awkward by far as a poker, and requires no preliminary arrangements, as the gas flame.

I am astonished that the sprengkohle seems to be quite unknown in your country. Therefore I give you the address of our first rate store, whence it may be got. It is Lenoir & Forster, Vienna V. Waaggasse 5. I do not remember what I paid for the case I send you. At all events it was a trifle, perhaps 15 or 20 cents.

FRED. MULLER.

Vienna, May 1, 1891.

[A trial of the cracking coal shows it to be very satisfactory for the purpose named.—ED.]

Jet Propulsion.

To the Editor of the Scientific American:

I have been a constant reader of your valuable paper, the SCIENTIFIC AMERICAN, for the last fifteen years, and I, as well as all the members of my household, look forward to its appearance in the house every week as a source of pleasure and profit to us all. During the above period I have read with interest the different articles appearing in its pages on the system of propelling vessels by a jet of water under pressure. In your last week's issue, May 9, there is an article on this subject from the pen of Mr. Alex. Vogelsang. His ideas as stated therein are, I believe, valuable, but they do not embrace enough to solve the difficulty or give the best results. I have devoted a good deal of thought and study to this subject, and the conclusion I arrived at two years ago, in order to get the highest rate of speed, was to have the vessel propelled by a combination of the screw propeller (smaller than the usual size) and one or more jets of water under heavy pressure, in the following manner: Have the propeller shaft hollow except the extreme outer end, and the wings of the propeller also hollow, and these hollows to connect with the hollow in the propeller shaft by suitable openings, and have an opening or nozzle in each wing of the propeller, not on the outer ends of the wings, but in their sides or edges well out to their outer end, opening in the opposite direction of the vessel's way or course. Have the force pumps in the vessel connected with the hollow propeller shaft, which needs to be no longer than to give the necessary bearings by means of a gland and packing. It will follow by forcing water at a high pressure through the hollow shaft, thence through the openings into the hollow wings and out at the openings or nozzles in the edges of the wings, that the same results claimed by Mr. Vogelsang will be attained, and the propeller will be forced to revolve by the force of the water leaving the openings in the wings, and thus the power of the improved jet and the propeller will combine to give motion to the vessel. This in my opinion is the true way or principle to get the most power out of one or more jets of water for propelling a vessel. The further details which I have worked out would be too lengthy to give at present writing, but would do so if necessary at some other time. JAMES S. PARMENTER.

Woodstock, Ontario, May 13, 1891.

Jet Propulsion.

To the Editor of the Scientific American:

In your edition of May 9, 1891, Mr. Vogelsang gives his experience in jet propulsion. The subject is one of entrancing interest, and the more discussion there is on it, the sooner we shall get sifted down to facts and possible success, and view the subject from a practical standpoint.

All the proposed plans I have read of deal in small jets with high velocity. These bore a hole in the water, but do not propel. It would seem possible to get the best results by offering volume of resistance to volume of power. If the power is so great as to annihilate the resistance, the power is wasted and little or nothing gained in propulsion. If a lower velocity of power was applied against an increased surface of resistance, would it not produce more satisfactory results? We do not want a sledge hammer to strike at a fly.

Power is ordinarily most effective at its point of application, which in jet propulsion would be just beyond that point where it issues from the pipe and begins to press upon the water. If the resistance is slight, the movement of the boat is slow, but if the power applied is met with a commensurate area of resistance, the speed of the boat will be increased. If the outlet is confined to one jet, it must be large, or it might be better to have several outlets at different points. The possible merits of centrifugal jets must be determined by trial.

The same article states that "a great velocity is imparted to the adjacent water, in the same direction as the moving vessel, by which the jet would meet with little resistance and create a greater slip" (?)

That parallel movement of the water would be an advantage as far as resistance and slip is concerned. If the water was stationary, the movement of the boat would necessitate greater velocity of the jet to offset the difference. This fact is well known in regard to stern wheel boats, in which the slip of the wheel is much below that of side wheels. The square stern carries with it a mass of water by the suction of the boat's movement, and thus offers a better resistance to the paddles than if it flowed away from the boat at the same speed as the boat progressed.

It may be well to consider the area of resistance to the paddle wheel, which it is proposed to supplant with a jet.

Say three paddles immersed, each 15 ft. long and 2 ft. wide, would give 90 ft. area to each wheel or 180 ft. to two wheels. That represents an ordinary area of steamboat paddle, driven with great force against 180 square feet of water, and such a power as therein exists we can hardly hope to equal with a syringe.

The wheel is solid and the water gives away before it. With water driven against water there is a double loss by such contraction. There is a dreamy future to jet propulsion like there is to electricity. We do not know how very little we know about it.

J. B. BROLASKI.

St. Louis, May 9, 1891.

A Lightning Stroke.

To the Editor of the Scientific American:

Having been a constant reader of the SCIENTIFIC AMERICAN for the last ten years, and having seen occasionally accounts of the freaks of lightning in its columns, I would like to write you of the work of a stroke near this place.

On the evening of April 25 last, during a violent thunder storm, the lightning struck the lightning rod on a dwelling house, followed the rod until it came to a defective insulator, then entered the house, striking Mr. Roode about half inch back of the ear and burning its way the entire length of his body, then through a wool mattress, splitting a hard maple bedstead, afterward passing through various parts of the house until it reached the water pipe.

After four hours of skillful work Mr. Roode regained consciousness and is on the road to recovery. His body is now so heavily charged with electricity that he can impart to any one taking him by the hand an electric shock equal to that received from a powerful battery.

Jewett City, Ct., May 13, 1891. L. D. HOWE.

Coast Defense.

At a recent meeting of the Institute of Naval Architects, London, Lord Brassey expressed his views as follows:

We have now to deal with coast defense. The flotilla for this purpose should include rams, monitors, and armed torpedo vessels of the Polyphemus type improved. For coast and harbor defense a torpedo flotilla has been proved to be in a high degree effective. Seven ironclads and eleven other vessels were sunk by defensive torpedoes during the American war of secession. In the war with Paraguay, the Brazilian ironclad Rio de Janeiro was destroyed by similar means. During the Russo-Turkish war the Turks lost a gunboat and a monitor in the Danube, and a steamer of 1,200 tons at Batoum. It will probably be well to have torpedo boats of two classes. The first class, of not less than 150 tons, should be able to cruise with the fleet within a certain distance from the coast. The second class boats, for harbor defense, may be of small size and cheap construction. In the conditions which favor the attack by the torpedo boat upon heavy ironclads blockading a port, a small and cheap type will be almost as effective as one more costly. Of fifteen attacks with the spar torpedo, enumerated by Ledieu and Caudiat, seven were more or less successful. The same authors mention it as a notable fact that, while in all cases of frail construction, no boat armed with the spar torpedo has yet been destroyed by the enemy's fire.

In proposing the defense of harbors by a torpedo flotilla, he offered no new suggestion. In inviting more attention to the monitor type, he entered on more debatable ground. The Monitor was designed by Ericsson with the view to reduce as much as possible the surface exposed to the enemy's fire. It was capable of floating at a light draught. In the bombardment of Charleston 2,330 projectiles were fired by the forts. The monitors were struck 256 times. They sustained no serious injury, and must be pronounced to have been thoroughly efficient for coast service and harbor defense. With their deck openings properly closed, they withstood the fury of raging seas. In the United States the qualities of the monitor type have always been highly appreciated, and a heavy expenditure has been incurred in rebuilding many of the original vessels. The American board of naval policy recommended a ram with a displacement of 3,500 tons. The navy department has produced a design, now in course of construction, of 2,950 tons displacement, heavily armored, no armament, speed 18 knots. Our Polyphemus, simplified and cheapened, offers a type which we have unaccountably neglected. The French are building two torpedo rams considerably smaller than the Polyphemus. We should build rams of a type which should not only be adapted for coast and harbor defense, but efficient for service with a sea-going fleet. In concluding these observations on cruisers, he would press most strongly the necessity of a large re-enforcement to the navy of first-class cruisers of the Blake and Blenheim and Edgar types. The necessity for the smaller class is obvious, but our requirements have for the present been largely provided for under the Hamilton programme.

As a five years' programme, he would propose ten battleships, six armored coast defense vessels, monitors, six armored rams. Polyphemus type improved, forty cruisers of the first class, thirty look-out ships, and fifty torpedo gun vessels.

In conclusion, he regretted that he appeared as the advocate of a heavy expenditure on naval defense. Our necessities have been created chiefly by the policy of other powers, who are making preparations to take the offensive if the occasion should arise. The splendid enterprise of our seamen and our merchants involves expenditure on the navy. Year by year our shipping bears an increasing proportion to the aggregate tonnage of the world. Property of a value exceeding £150,000,000 is always afloat under the British flag. To create a trade of enormous magnitude, and to make no adequate preparation to defend it, would be to invite attack and to expose ourselves to humiliation.

Killed by Locusts.

A recent telegram from Algiers, Africa, says the French savant, M. Kunckel Herculais, the president of the Ethnological Society, who was employed on the government mission of investigating the locust plague in this province, has met a horrible death. While examining a deposit of locusts' eggs at the village of Sidieral, he was overcome with fatigue and the heat and fell asleep on the ground. While sleeping he was attacked by a swarm of locusts. On awaking he struggled desperately to escape from the living flood. He set fire to the insect-laden bushes near him, but all his efforts proved ineffectual, and when finally the locusts left the spot his corpse was found. His hair, beard, and necktie had been entirely devoured.

M. Herculais was a member of the French Academy and the author of several valuable works on insects.