

NEW APPLICATIONS OF ELECTRICITY.

Mr. Gustave Trouve has recently added two new inventions to the great number of creations of his fertile brain already perfected. We refer to two new applications of electricity which he presented to the Academy of Sciences, Monday, July 6, and which relate to the aiming and shooting of firearms at night. Their originality induces us to reproduce the note of the inventor to the Academy.

The first of these inventions consists of a luminous electric button; and the second, of a powerful projector. These devices are removable, and can be applied to any fire arms. Their operation is absolutely automatic. The Trouve electric button is of the same size as ordinary metallic buttons, and consists of a fine thread of platinum introduced into a small glass tube, which is protected by a metallic tube. A small opening is left in the metallic tube, so that the luminous button is visible only to the person using the weapon, to assist him in taking aim, but is completely hidden from the enemy or any one who is a few feet from the barrel of the gun. The device is operated by a hermetically closed pile of Mr. Trouve's. This pile, which is about as large as the little finger, can be secured on the barrel of the gun, parallel with the same, by two rubber bands. As the pile operates only when in a horizontal position, the button is illuminated as soon as gun is adjusted for firing; but when the gun is held upright, the pile ceases to operate, and the button becomes dark. It is easy to realize the great advantages offered by this device in taking aim in the dark.

The luminous electric projector consists of a little incandescent lamp and parabolic reflector, or an incandescent lamp and a condensing lens inclosed in a metallic tube. The apparatus is easily secured on the barrel of a gun, parallel with the same, by two rubber bands. It is made to operate by pressing the butt of the gun against the shoulder. By means of this device the desired object can be illuminated, and all its movements followed. The generator used is the same as that used with M. Trouve's electric safety lamp, recently presented to the Academy by Mr. Jamin. It is carried in the belt, and its operation is automatic.

The services which these two apparatus are capable of rendering to the army and navy are very numerous. It is mentioned, for example, the advantages they will offer for watchmen on men-of-war in helping to fire upon torpedo boats at night, as well as in the daytime. They will also be very useful to hunters who wish to secure game at night.

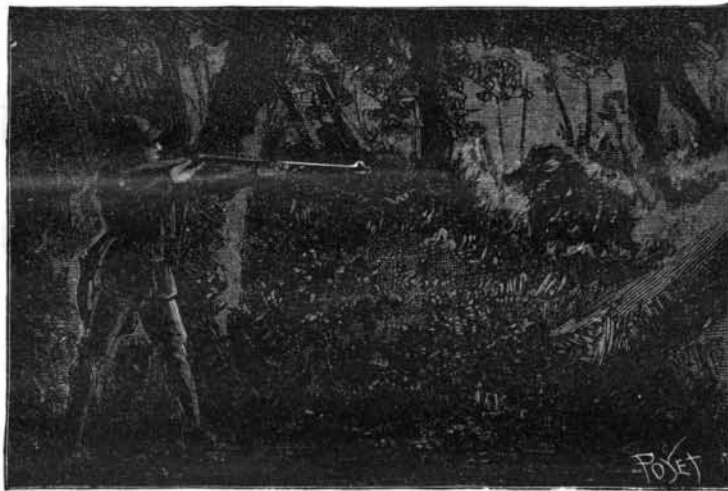
Electricity and Dust.

With regard to the experiments made by Professor O. J. Lodge, it has been pointed out by a German paper that a similar experiment was described by C. F. Guitard, of London, in the *Mechanic's Magazine* for November 2, 1850. The following is an extract: "Some time since, in experimentalizing on the electric state of the atmosphere, I employed for that purpose a large glass cylinder, about 18 inches high and 9 inches diameter, open at bottom and having a neck at top. In placing the lower end of this cylinder in water, the more perfectly to exclude the air, and allowing small quantities of tobacco smoke to enter the neck at top, the smoke, after assuming various actions, according to, probably, the hygrometric state of the atmosphere, would gradually spread itself into a cloud filling the cylinder, and at length, as successive portions came in contact with the sides of the cylinder, condense. Sometimes half an hour would elapse before this effect took place. In now struck me that if I brought a wire from an electrifying machine into the neck of the cylinder, the air would immediately become charged with electricity, which would cause each portion of the smoke to fly to the sides of the cylinder, and that thus more rapid condensation would take place. The effect produced was perfectly magical. The slightest turn of a small electrifying machine produced immediate condensation. It was astonishing to see how small a quantity of electricity produced a most powerful effect. I am not aware that attention has ever been drawn to this subject; and the question will probably arise—Has electricity anything to do with the condensation of steam in the condenser?"

For a harness blacking, use boneblack, 4 ounces; linseed oil, 2 ounces; sulphuric acid, ½ ounce; treacle, 2 ounces; gum arabic, 1 ounce; vinegar, 1 pint.

A Hairless Calf.

A curiosity in the shape of a perfectly hairless calf was born at Pawnee City, Nebraska, in the middle of March last. The animal, now about five months old, is well formed and apparently in perfect health, but its skin is quite destitute of hair. It is a male, weighs over two hundred pounds, and shows an appearance of horns. So far as can be learned, there is nothing in its pedigree to account for this departure from the normal type. Both of its progenitors were pure-bred short horns. Should this unique animal survive, it would be a matter of considerable scientific interest to keep track of its descendants, in order to determine whether this apparently accidental variation is capable of trans-



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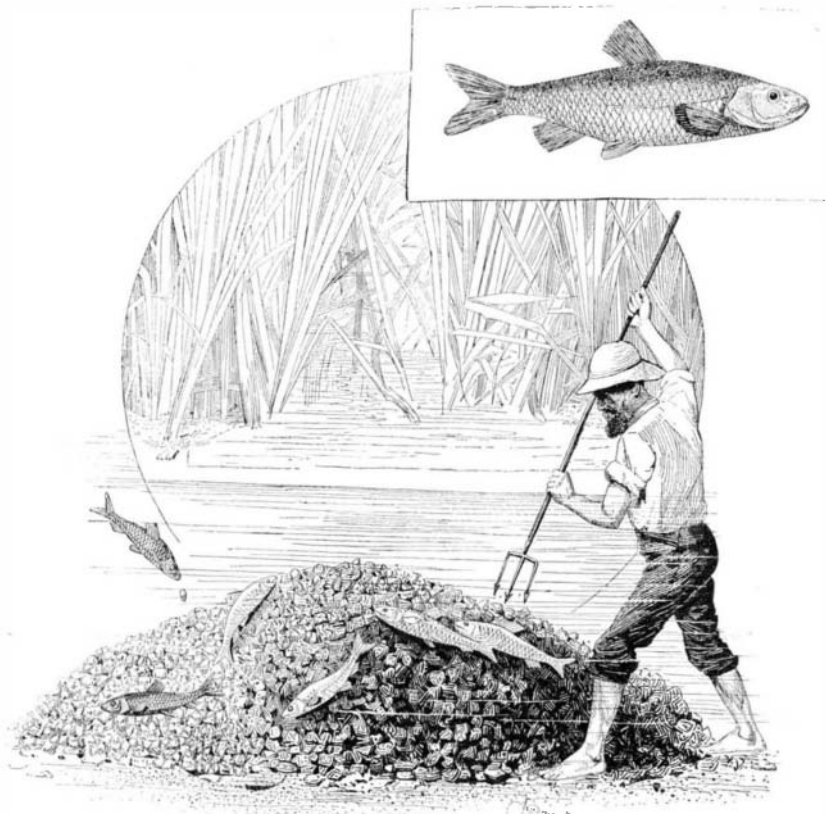
mission or whether it disappears with its first possessor. The owner of the animal, Mr. J. H. Bray, has named it Young America.

CONSTRUCTIVE ABILITY OF FISHES.

BY C. F. HOLDER.

In previous numbers of the *SCIENTIFIC AMERICAN* the writer has shown the nest of the antennarius and paradise fish, the former being made of gulf weed woad in and out and bound together by gelatinous bands of some secretion taken from pores in the abdomen; the latter formed of bubbles of air inclosed in a mucous envelope.

In the accompanying cut is shown a nest of an entirely different character, where the material is stone, and to accumulate which much have involved a vast amount of labor and patience on the part of the finny workers. It has been my privilege during the present summer, spent on the St. Lawrence River, to examine a large number of the nests or heaps, and some of them for their great size almost challenge belief. The boatmen of the St. Lawrence know the heaps as chub beds, yet it is a curious fact that some of them differed widely



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in their opinions as to the makers. One man was positive that the piles were the work of the black bass (*Micropterus salmoides*), and that the stones were piled up with their tails. When asked for his reasons, he said that he had seen big bass on the heaps, and speared them there. Another man, born in sight of the nests, was positive that they were the work of muskrats (*Fiber zibethicus*), his reason being that he had speared muskrats swimming about the nest. I

give these opinions to show how little confidence can be placed upon the opinions of unskilled observers, though, in justice to the men, it should be said that they were given in good faith.

Quite a number of men had seen muskrats around the heaps, and Mr. Andrew Clerk, of Jersey City, with whom I was fishing when these investigations were made, suggested that the muskrats were after the chub spawn; and to show that not only muskrats but field mice are fond of it, he cited the following instance, that will be of interest to naturalists:

Some years ago he owned a salmon river in the Provinces, and had unusual opportunities for many years of observing the habits of salmon and other fishes in the locality. Wishing to ascertain the natural feed of the sea trout, he directed his guide to save the stomachs of twenty or thirty. Examination of a dozen or so of these showed that in each was a field mouse (*Arvicola rutilus*, I should judge from the description, etc.), and in one stomach were two. It occurred to Mr. Clerk that the mice had been caught while diving for spawn. This opinion he expressed to a friend connected with the New Jersey State fisheries, who said that his eggs were so depleted by common mice, that would dive into the water to obtain them, that he was obliged to protect the eggs by wire screens. So it would seem that mice and muskrats are among the possible enemies of the spawn of game fishes and others.

The chub beds are found on gravelly or sandy shores on almost every island between Clayton and Alexandria Bay, and I found them in all stages of growth. One of the best localities was in the entrance to the Lake of the Islands, where, on the north shore of an island belonging to La Rue, are five or six large nests, all within a small area, and all visible from the boat at once. The largest of these was at least ten feet across the base, and, as near as I could judge, almost four feet high. The stones were all about the same size, and those that I could reach from the boat, and which brought the top of the heap to within a foot of the surface, weighed four ounces; and at the base were others that I should judge would weigh twice as much. They were of all shapes, and the entire heap looked like a load of stones that had been dumped carefully, so that it retained a somewhat regular cone-shape. Some resembled hay mows, and were flat on top; others were pointed, and I found quite a number where the work was just commenced; and, whether from design or accident I cannot say, there was a rude outline, as if the builder had a definite plan, the stones having been dropped in a semicircle before any had been placed in the center. In these new nests there were generally numbers of shells, evidently a *Unio*.

As some of the large nests were some distance from gravel beds, and the stones numbered tens of thousands, each heap weighing perhaps a ton and a half, the amount of labor done by these fishes can well be imagined, especially when it is known that the stones are brought in the mouth of the fish.

I was not fortunate in observing them at work, but it is well known how they proceed, and Mr. Clerk was fortunate in knowing a gentleman who had seen the chubs carrying stones. The largest nests were within a foot of the surface, and would undoubtedly form an obstruction to boats drawing two or three feet of water, should they run along shore. Exactly how high the chubs would build their nests it is difficult to determine, as every winter the nests are frozen in solidly, and during the breaking up in the spring are denuded of some of the stones. That the nests are renewed year after year is evident from their size, and again, the rocks on the top were usually much fresher in appearance than those below, showing that they had been recently handled. The nests are constructed for the preservation of the eggs; in other words, to protect them from the eels, bull-heads, and various fishes that affect spawn.

The breeding time is in the last of May, June, and perhaps into July, or about the same as black bass, and during this time large chubs are seen resting on the heaps. The eggs, when deposited, are washed into the crevices and interstices of the heap, and there find protection until the young appear; and they undoubtedly remain near it until they are strong enough to care for themselves. I could not find that the male remained near the nest, or exercised any care over the young. This, however, would be unnecessary, as the stone pile is quite protection enough.

The nests are undoubtedly the work of several chubs, how many, I have not been able to determine; but as fifty or more lamprey eels have been seen at work conjointly, it is not unlikely that the nests are the work