

UMBROMANIA.

The idea of projecting the shadows of different objects (among others, the hands) upon a plane surface is very ancient, and it would be temerary to attempt to assign a date to the creation of these animals and classic figures, such as the rabbit, swan, negro, etc., that have served to amuse children in the evening since time immemorial.

Within a few years, these rude figures have been improved, and we are going to show how the play of shadows has now become a true art instead of a simple diversion. The Italian painter Campi was one of the first who thought of adding new types to the collection of figures capable of being made with the shadow of the hands. He devised amusing forms of animals that delighted the school children before whom he loved to exhibit them. His imitator, Frizze, imported the nascent art into Belgium, and it was in this latter country that our countryman, Trewey, got his knowledge of it.

Trewey was not long in discovering that umbromania was capable of improvement, and, after patient exercise of his fingers to render them supple, he succeeded in producing new silhouettes, which are, each in its kind, little masterpieces. Before giving a glimpse of these, we must point out what the various exercises of the hands and fingers are that it is indispensable to perform in order to reproduce such figures more or less perfectly.

The first exercise consists in bending the little finger as much as possible without moving the others, while the hand is spread out. It must be understood that all that is done with the right hand must be repeated with the left.

The two hands being once broken in to this motion, the little finger is raised and an effort is made to bend the middle and ring fingers, while the fore and little fingers remain extended.

The third exercise consists in bending solely the two last joints of the first and little fingers, while the ring and middle fingers are bent inwardly. In this position, if the thumb be bent inwardly, it will be found that the shadow made by this profile on the wall will form the head of a cat.

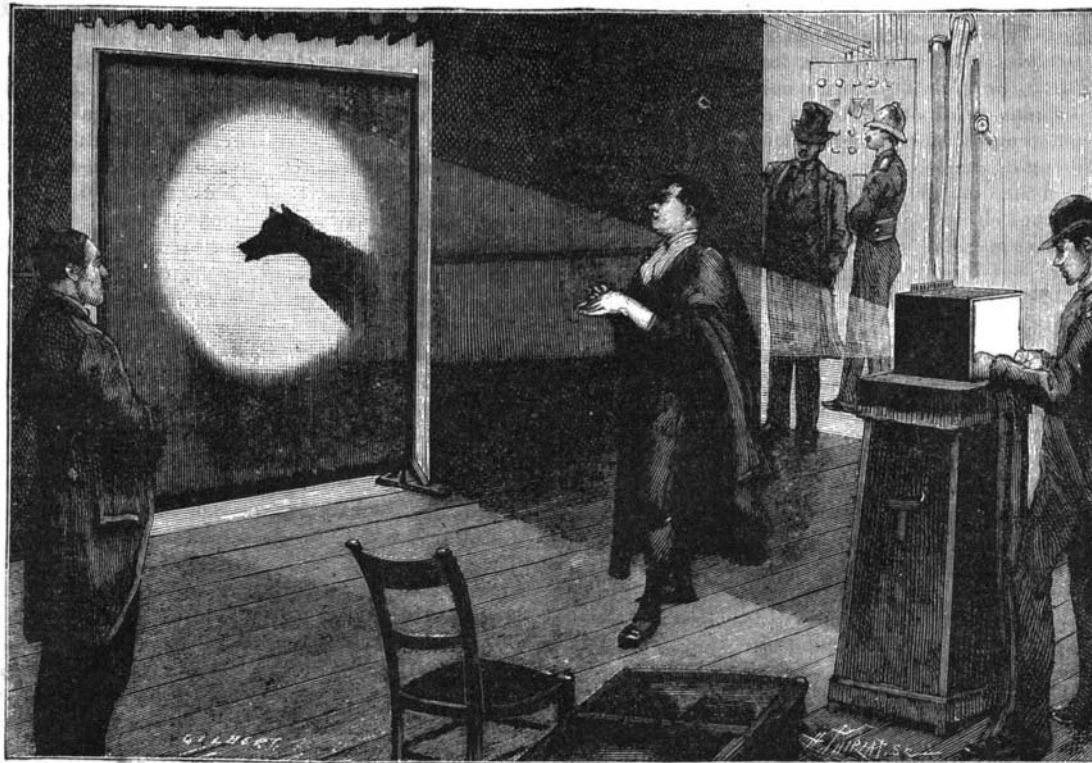
The fourth exercise consists in leaving the two last joints of the first and little fingers bent, and in extending the middle and ring fingers. Afterward follow exercises in separating the fingers from each other by opening them in the direction of the width of the hand. First, it is the little

finger that is isolated, the fore, ring, and middle fingers resting against each other; then it is the separation of the fingers into two groups, the little finger against the ring finger, and the middle against the fore finger, the latter and the ring finger making as wide an angle

screen, but can also give them motion and life. The swan smoothing its plumage, the bird taking flight, the cat making its toilet, the tight rope dancer, who, after saluting the public, rubs chalk on her feet before walking on to the rope, are true wonders, and it is hard to believe that these perfectly accurate profiles are obtained solely by means of the shadow of the hands. The artist has thus far devised more than 300 figures, and his inventive mind is leading him to get up new ones every day.

Instead of reproducing a large number of these, we have thought it would be better to devote ourselves to the study of one in particular, in order to initiate our readers the more perfectly into the art of umbromania. Let us, for example, take the dog's head represented in Fig. 1 (No. 1). The ears are erect, and we conjecture that the animal has just scented a choice bit. In fact, he is snapping at it, and No. 2 shows us the efforts that he is making to swallow his prey, which is represented by the angle of the bent forefinger that moves in the mouth. After strong efforts, the mouth is seen to close (No. 3), showing the act of swallow-

Fig. 4.—TREWEY EXHIBITING UPON A STAGE.



as possible. Then comes the assembling of the fingers, the extremities of each being hidden behind the middle finger, so that the hand has the profile of a spear head. Finally, we have the exercises in which each finger is made independent of the others, one being bent to the first, the other to the third joint, the latter extended as when the hand is open, the former elongated and at right angles with the hand.

It is through such a series of exercises of the fingers that Trewey has made his hands so supple that he not only can form the most diverse figures upon a

ing. A progressive motion of the hand shows us the swelling of the throat caused by the descent of the food in the œsophagus. One would imagine that he had before him the shadow of a genuine dog, so wonderful, natural, and accurate are the motions. After this laborious repast, we finally see the animal yawning voluptuously, the middle finger representing the tongue, which cleaves to the palate, and the general profile of the head expressing the completest beatitude.

It is very evident that in order to reach such a degree of perfection, the artist must be naturally endowed with great manual dexterity, without which the preparatory exercises would give no result. There are signs by which such dexterity is recognized, and an attentive examination of Trewey's hand has enabled us to verify the laws laid down by Mr. H. Etienne upon the native perfection of the senses. Thirty-five years of research have permitted Mr. Etienne, who has been continuously in contact, in shops, with Swiss watch makers' apprentices, experienced workmen, and artists even, to find a certain criterion by which to judge of aptitudes in different trades and several professions.

A young Frenchman who, after reverses of fortune, was

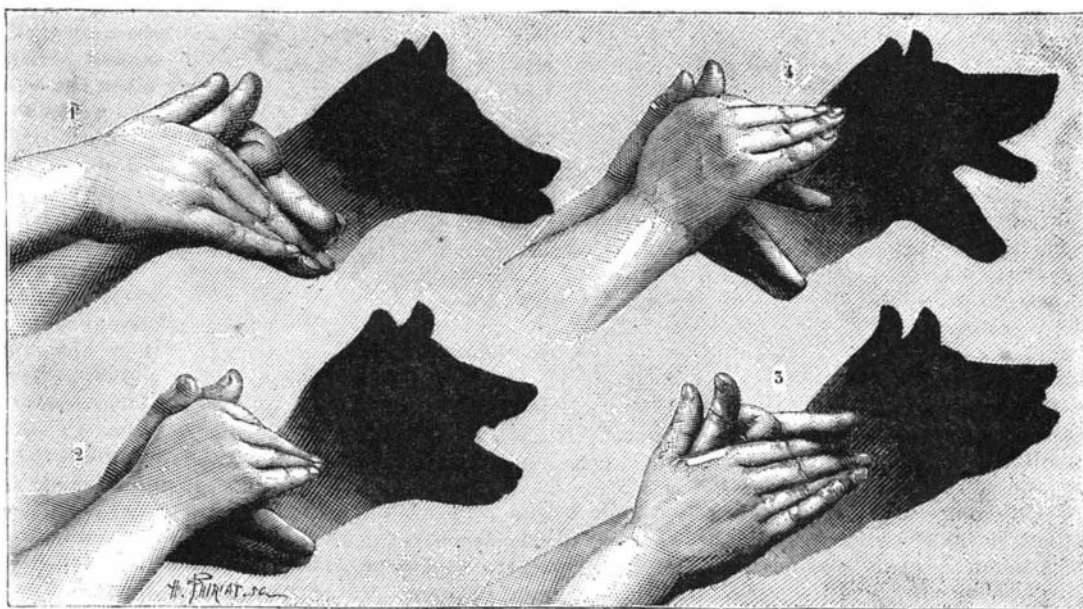


Fig. 1.—SHADOWS OF A DOG SWALLOWING A PIECE OF MEAT.

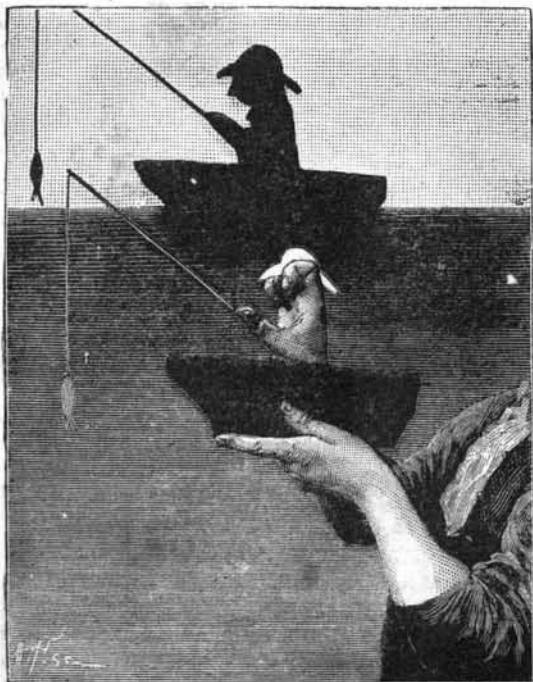


Fig. 2.—THE FISHERMAN.



Fig. 5.—THE PREACHER IN THE PULPIT.



Fig. 3.—FIGHT BETWEEN A JANITRESS AND TENANT.

desirous of giving up the study of the law in order to learn watch making, presenting himself one day before Mr. Etienne at the shop of a skillful master of apprenticeship, who received the intelligent countenance with eagerness; but, while pressing the hand of the future apprentice, a cloud passed over the face of the placid master clock maker. "What did you feel, then, in pressing the hand of that young man who has just gone out?" asked Mr. Etienne. "With hands like his we don't make a watch maker," was the reply, and the prediction came true. It was as a consequence of this conversation that Mr. Etienne sought and discovered the following rules, that we think we can reproduce without straying from our subject.

The characteristic of dexterity is shown in the first place by the *curve of the thumb arched outwardly*. This is an indispensable condition for the handling of the hammer. The blacksmith, who wields with his arm the heavy striking mass that he lets fall perpendicularly, without deviation, repeatedly upon the same point; the file cutter, who strikes so regular blows upon the chisel that no flaw is visible in the cut, so equal everywhere is the imprint of the tool—these and all superb workmen, all artists who shape white hot iron with the hammer, who chisel the precious metals, who sculpture marble and stone, owe the exact precision in the force and accuracy of the blows that they give with the hammer to the suppleness of the first joint of their thumb. To this natural gift they owe their fortune, for, in shops, selection is made, to the profit of the most skillful, of those alone to whom the most difficult and most delicate work can be intrusted.

A second characteristic of skillfulness is indicated by the faculty of reversing the metacarpal phalanges of the fingers, so that when the hand is extended it is convex. On the greater or less flexibility of all the joints, either at the base or extremity of the fingers, depends the dexterity and skillfulness displayed in work executed with the file, plane, or lathe.

This suppleness cannot be independent of that of the thumb, but it does not replace it; while the curved thumb will more easily dispense with the great flexibility of the other fingers. These two characteristics are in most cases united.

Trewey's hand, reproduced by moulding, figures in several English museums. It possesses the faculty of reversal of the phalanges to the highest degree, and the thumb, which is of wonderful suppleness, renders Trewey, as we shall see, the greatest services in the formation of his shadows. Let us add that his fingers, which are long and slender, differ very perceptibly in length, the middle finger, for example, exceeding the ring finger by nearly an inch.

In addition to the profiles of men and animals composed by the artist, the latter, by means of a few accessories, exhibits to us living persons playing amusing pantomimes. Here, for example (Fig. 2), we have a fisherman. A piece of cardboard, properly shaped and held between two fingers, forms the hat; the boat is a piece of wood held in one of the artist's hands; a metallic ring holds the fish pole against the thumb of the other hand, and it is opposite this latter, bent as shown in the figure, that we observe all the emotions of the fortunate fisherman, who, phlegmatic at first, and livening up when the fish bites, finally is triumphant when he has it at the end of his line. It is necessary to have witnessed all these little scenes in order to understand how, by means of his fingers alone, the artist can evoke the laughter and applause of hundreds of spectators. Here, now (Fig. 3), we have a scene with two persons. It is a fight between a janitress and one of her tenants. As may be seen, the accessories are here very simple again. We believe that with a little practice our readers might succeed in reproducing these little scenes, and even get up new ones.

To make the shadows sharp, the following things are indispensable: The source of light must be a single lamp inclosed in a projecting apparatus, throwing very divergent rays. The lens must consequently be of very short focus. The electric light or oxyhydrogen lamp necessary in a theater may be replaced at the amateur's house by a lamp, or, better, by a wax candle, or, indeed, even by a common candle that gives very sharp shadows. The mirrors in the room where the exhibition is given must be veiled in order to prevent reflections, and all brilliant objects must be removed. When the oxyhydrogen lamp is used, the screen is placed ten feet away from the light, and the artist's hands at three feet from the same, and consequently at seven from the screen. But it will be understood that there can be no absolute rule about this, all depending upon the scale of the figures. It suffices to recall the fact that the nearer the hand is brought to the light, the more the shadow enlarges and loses its intensity, while on bringing the hand nearer the screen the shadow becomes sharper, but smaller and smaller. Fig. 5 shows Trewey exhibiting the scene of the preacher in the pulpit. The canopy is formed by the arm and the first phalanges of the fingers, bent at right angles, while a block of wood affixed to the arm near the wrist forms the pulpit. In order that the preacher may appear smaller than the pulpit, he must necessarily be nearer the screen, and this explains the distance

apart of the artist's arms in our engraving, the screen being situated in front of the arm that forms the preacher. The necessary distances, however, are best determined by experiment.—*La Nature*.

Driving the Jack Rabbits.

The Bakersfield people celebrated new year's Monday with their initial round-up of the rabbits at Henry Borgwardt's ranch, four miles from town, westward. There was a circular corral at the corner of his alfalfa field, where the sagebrush and pasture lie side by side. From this inclosure two wings of lath fence were stretched at right angles for a few hundred yards.

By 2 o'clock in the afternoon a large number of people had gathered, some on horseback, others in light vehicles. They had a commanding officer and a few field managers. No dogs were allowed upon the ground, and but a few guns in the hands of experienced sportsmen. The crowd having been so distributed and marshaled as to form a curving line about a mile in length, a signal to move forward was given and the drive toward the corral commenced. The area inclosed by the drivers must have been less than a square mile, but the *Echo* says that "as they drew near the apex of the triangle it seemed as if there were acres of rabbits. Of course a great many ran back past the people, and several hundred were killed with sticks while doing so, their fright being so great that they would run within a few feet of one's conveyance. When the corral gate was shut, it was found that the drive had been a grand success. By actual count after they were killed, there were 1,126 rabbits in the pen. Another march was ordered, and by passing over the same territory 796 rabbits were corraled and killed, besides a large number that fell by the way. It was generally believed that 2,500 was a safe estimate of the total number killed in the two drives."

Of course no firearms whatever can be used inside the corral, only clubs are permissible. Another observer writes: "It looked like very cruel sport, but their destruction is an inexorable necessity. Relentless war must be waged against them or they will take entire possession of the country."

This method of dealing with the destructive rodents bids fair to become quite general where they abound and the lay of the land favors; and as our "rabbits" are all hares, which know not the trick of escaping into burrows, the results of the process are comparatively certain.

At Bakersfield, Kern County, on January 10, there was a great rabbit drive. The account of the affair given in the *Echo* of January 12 is so sprightly, and contains so many valuable practical hints as to how a drive must be managed in order to secure the greatest success, that we quote it bodily:

In accordance with posters generally circulated about Bakersfield, a second rabbit drive took place at H. L. Borgwardt's ranch, the same place as the former one. At 1:30, the hour set for the meeting, at least 500 people had assembled on the grounds, and after partaking of the generous lunch prepared by Messrs. Swain and Borgwardt, proceeded to the place where the drive was to be held.

Preceding this, Commander McCord had sent a large delegation of horsemen to "round up" the rabbits in the field west of that where the principal work was to be done, so that by the time the crowd was ready to move in a body to the place where the drive was to commence, hundreds of rabbits had been driven out before them.

Companies were rapidly organized, 20 men on foot being assigned to each captain who was mounted. Eleven companies of men and boys were given positions, and two of ladies and girls under command of lady captains; and it is claimed by those present that more enthusiastic hard work was done by the latter than by any one else. Two large companies of men and boys on horseback, commanded by competent captains, were placed at the extreme right and left wings. The whole command formed a semicircle.

When all were in position, the commander raised his handkerchief, the signal for the start; this was repeated by his assistants and the captains, and simultaneously the whole line began a quiet work toward the corrals. At first the rabbits trotted slowly ahead of the drivers, but soon the horsemen on the left wing opened up a general shout, contrary to the programme, which so excited the rabbits that they turned toward the right wing, and ever so hard work of those in charge of that wing could not keep half of them from passing the line.

As the circle gradually closed, the drivers made a more compact body, so that when they reached the rabbit-tight wings there was little chance for a rabbit to go back without encountering one of the clubs in the hands of the footmen. Hundreds of them were killed in this way.

Just before the gate to the corral was reached, there was a general disposition on the part of the rabbits to turn toward the crowd. Had the latter been held in check for a minute, so as to give the rabbits an opportunity to see the gate, every rabbit would have been captured, but there was no such delay, and the

result was that nearly half of them went through the crowd.

It was estimated that 2,000 were corraled this drive. They were speedily killed with clubs and a second drive ordered. Commander McCord sent a large force of horsemen into the field north of the one where the main drive was held, to drive the rabbits in front of the companies, and it proved to be an excellent move, as it increased the count in the next drive by at least 1,000. Aside from the shouting by those on horseback, the last drive was as near a success as any one could wish. At the close, when fully 3,000 rabbits were massed in front of the gate, undecided which way to turn, the commander and his assistants held the crowd in check until the rabbits started for the gate, when a general rush was made, and in an instant 3,000 more rabbits were in the corral. After the killing a count was ordered, and the number was 5,075 in the corrals, and it was estimated that at least 500 were killed on the outside. This would total over 8,000 rabbits killed inside of one week on a field of less than 300 acres.

Photographing Invisible Objects.

New means for the photographic study of the stars has recently been devised by Mr. C. Zenger, which may probably find other applications in science. Mr. Zenger, struck by the phenomenon that the summit of Mont Blanc retained after sunset until half-past ten a phosphorescent bluish appearance, thought it possible to utilize it for obtaining a photograph of the mountain. For this purpose he projected, by means of a photographic camera, the image on a plate covered with a layer of Balmain's luminous paint. After an exposure of a few seconds, this plate was held in contact in the dark with a dry photographic plate, and at the end of an hour the image of the mountain was obtained complete with all details, as if taken in the ordinary way. This result permitted conclusions to be drawn that the carbonate of lime exposed during the day to a brilliant sunshine emitted during the night invisible but very actinic rays. Experiments were made at Prague, where very fair photographs of the buildings surrounding the observatory were obtained during night time, which seems to confirm the theory that light can be absorbed and slowly re-emitted, and that the images of invisible objects can be fixed in the darkness by means of actinic rays. This new process will no doubt be of service in the preparation of astronomical maps, but can be applied to other things. Ordinary paper also possesses the property of returning light, and when impregnated with fluorescent solution, such as nitrate of uranium, latent pictures can be obtained, which can be developed months afterward, if they have been preserved in the dark in perfectly dry air. Mr. Zenger has studied this subject for more than two years, and has succeeded in preparing plates sensitive to all the radiation of the solar spectrum, from ultra violet to ultra red. He thinks there can be little doubt that, by rendering the invisible rays visible through their photographic effects, many fresh revelations about the constitution of the universe and its component natural objects may be obtained.—*Iron*.

Stones in Seals' Stomachs.

At a recent meeting of the Bristol Naturalists' Society, Dr. A. J. Harrison read a paper on "The Ballast Bag of the Seal." The seals are carnivorous mammals divided into two classes—the Phocæ, or common seals with rudimentary ears, and the Otariæ (sea lions, bears, elephants), which have the ears developed. According to the fishermen, the Otariæ have an internal pouch known as the "ballast bag," because it is always found to contain a number of rounded stones. The presence of these is accounted for by saying that when the animals grow very fat they become so buoyant as to be unable to sink below the surface of the water without the aid of some ballast, which they secure by swallowing stones. This theory implies the possession by the seals of considerable reasoning power. Observations have shown that the so-called "ballast bag" is only the stomach; and accordingly some people have suggested that the stones are intended to assist in the trituration of food, in somewhat the same manner as in the gizzard of fowls. Other persons suppose the stones subserve no useful purpose, and are accidentally introduced with the food, or in play. In the seals and sea lions at the London Zoo similar rounded stones have been found, large numbers of which are quite foreign to the geological character of the district. A Newfoundland seal which died at the Clifton Zoo in 1886 was examined by Dr. Harrison, who found in the stomach gravel, nuts, and pieces of stick.

Cable Roads in England.

According to our English exchange papers, the cable system for tramways has just been introduced at Birmingham. They speak of it as marking another important departure in the mode of street travel, and prophesy its wide introduction in other cities. A cable road is now being constructed between Kensington and King William Street, old London.