The House Wren as an Insect Destroyer.

The observations I have been able to make during a residence of several years on a farm, have convinced me that the common house wren is really one of our most valuable birds, not, perhaps, for what they have done, but from the possibilities wrapped up in their diminutive bodies. They are quite as social as the purple martin or blue bird, and greatly surpass both of these in the rapidity with which they increase. I began several years ago to provide them with resting places in the vicinity of my buildings. Sometimes I fastened the skull of a horse or ox, or a small box, in a tree top. But latterly I have made it a practice every spring to obtain thirty or forty cigar boxes for this purpose. If the box is long and large, I put a partition across the middle and make a hole through into each apartment. It is very seldom that these boxes are not occupied by one of these little families. In most instances two broods are annually reared in each nesting place. One of my boxes last season turned out three broods of young wrens—six little hungry birds each time, or eighteen in all! I think a cigar box never before did better duty. The lamented Robert Kennicott stated that a single pair of wrens carried to their young about a thousand insects in a single day! Like all young, rapidly growing birds, they are known to be most voracious eaters, living entirely upon insects. The point upon which most stress may be laid is this: That by providing them with nesting places, in our gardens, orchards, or grounds, and not allowing them to be caught by cats or scared away by mischievous boys, we may have scores if not hundreds of them about during most of the time in which insects are destructive. They undoubtedly return to the same localities to rear their young year after year. Last season I had up about thirty of these nesting boxes, and all but two or three, which were not favorably located, were occupied. My crop of wrens could scarcely have been less than one hundred and fifty, and the old birds filled the air with music when they were not on duty in building their nests or feeding their young. The coming spring I intend to put up at least a hundred of these nesting boxes in my orchards and groves, and I have no doubt I shall be repaid a hundred thousand fold for the little labor it costs. As long as they come back so regularly every year and in constantly increasing numbers, and serve me so well, I shall do all in my power to protect and encourage them. And I am of the opinion that when one species of social, useful birds can be made to congregate in such unusual numbers, others will come also. But the hardiness, sociability, love of the locality where it was reared, and wonderful fecundity of the little house wren, render it, in my judgment, one of the most valuable of all our insectivorous birds.—*Charles Aldrich, in the American Naturalist.*

THE LUMP FISH.

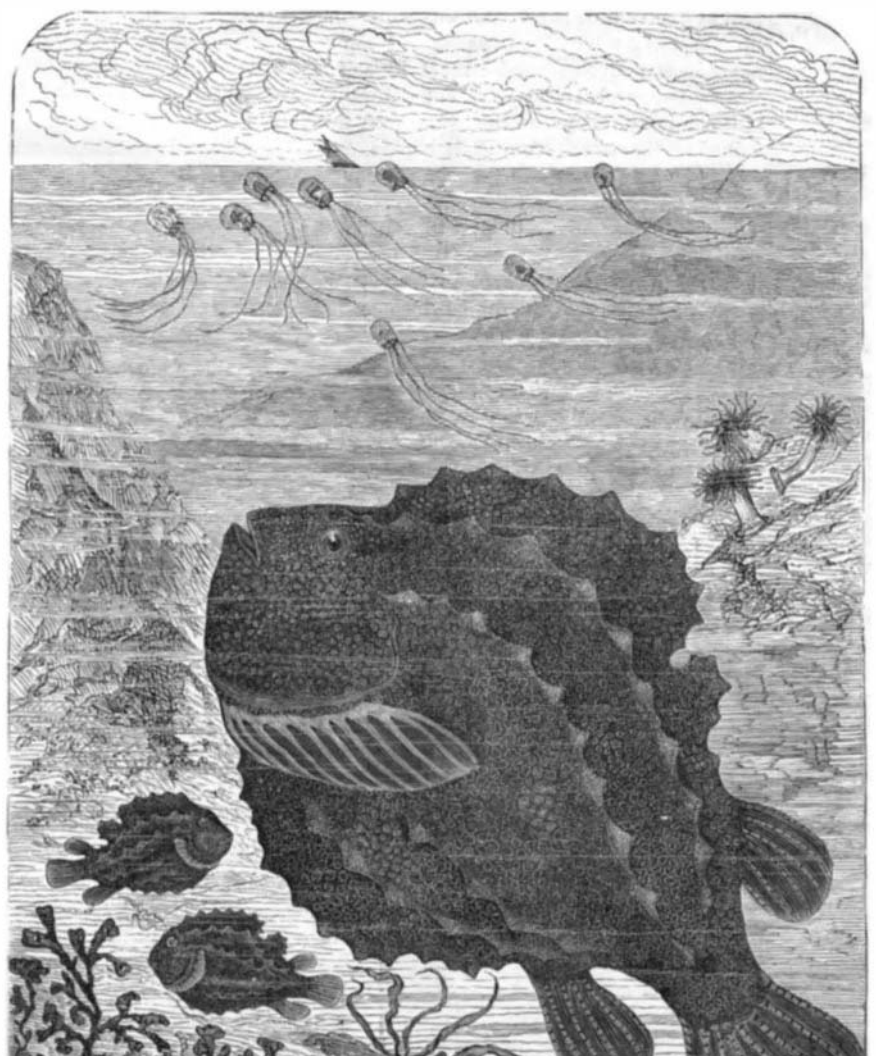
Family Cyclopteridæ, a small family, characterized by the ventrals being united into a disk or cup-shaped form. Body smooth and without scales. Eyes placed on each side of the head. The two dorsal fins are so much enveloped in a tuberculous skin as to appear like a hump on the back. Body deep and rough, with bony tubercles.

The shape of the lump fish is suborbicular in outline, compressed towards the dorsal ridge. The body of the fish is soft and flaccid, resembling a lump of jelly. Instead of scales, the body is covered with minute bony tubercles. From the anterior portion of the dorsal ridge, the outline slopes in a concave line to the orbits, where it becomes abruptly declivous to the snout. The space between the orbital ridges, flat. On the top or ridge of the back is a series of large compressed tubercles, and a smaller row on the anterior slope. Other series of tubercles are distributed over the body. The eyes are prominent. The nostrils double, mouth moderately large and broad, the under jaw slightly longest, small blunt teeth, in three or four rows, in front of each jaw; teeth also on the pharyngeals, and a small patch on the base of the tongue, which appeared to be distiuct from the pharyngeals.

The dorsal hump, without any vestige of rays, ventrals immediately under the pectorals united into a disk, with a funnel-shaped cavity in the middle; the margins softly dentated. The skin of the lump fish is very thick, the stomach enormously large, intestines very long. No air bladder.

The range of the lump fish is from the polar regions to Cape Hatteras. A spinous variety inhabits the coast of Greenland and the Bay of Fundy. On the Long Island coast the lump fish is called the indigo bag, from the fact of its being of an indigo blue in color. On the Scotch coast it is called the cock-paddle and hen-paddle. In England it is known as the lump sucker and sea owl. On the French coast *licorne de mer*, where it is considered a great delicacy, and is known as a valuable market fish.

The little jelly fishes shown in the illustration as floating near the surface of the water, are known as sarsia, while its hydroid is called coryne. The sarsia is about the size of a small walnut, with a wide circular opening, through which passes the long proboscis, hanging from the under surface of the disk to a considerable distance below its margin. The four tentacles are of an immense length when compared to the size of the animal.



THE LUMP FISH.—(*Cyclopterus lumpus.*)

AMPHORA OF BRONZE AND WHITE METAL.

We give an engraving of a fine amphora of French manufacture, classical in design and highly wrought. The body

AMPHORA OF BRONZE AND WHITE METAL.

is of bronze, and the medallions and a portion of the ornaments are composed of white metal, giving a rich and striking contrast. It is mostly handwork, and is a truly artistic piece of metal work.

Recent Facts about Smallpox.

An interestiug illustration of the value of revaccination is afforded by a report just furnished, at the instance of the Local Government Board of London, by the chief medical officer of the General Post Office. This report relates to an average number of 10,504 persons permanently employed in the postal service in London, all of whom have been required to undergo revaccination on admission to the service, unless that operation had been performed within seven years previously. Among these persons during the ten years 1870–1879 there has not been a single fatal case of smallpox, and in only ten instances have there been non-fatal attacks, all of which were of a very slight character. In the telegraph department, where the enforcement of revaccination has not been carried out with quite the same completeness, twelve cases have occurred in the same period among a staff averaging 1,458 in number. Eight of these attacks were of persons who had not been revaccinated, and one proved fatal. The remaining four were of revaccinated persons, who all perfectly recovered without pitting. This experience, like that of the nurses at the smallpox hospitals, seems to show that revaccinated persons enjoy absolute immunity from severe attacks of smallpox, and that their risk of catching that disease at all, even in its most modified form, is infinitesimal.

Heath's Discoveries in South America.

PROF. JOHN D. PARKER, KANSAS CITY, MO.

Since the death of Prof. Orton in South America, his assistant, Dr. Ivon D. Heath, and his brother, Dr. E. R. Heath, have both taken a deep interest in completing the unfinished work of that expedition. Prof. Orton had formed the purpose of conducting his expedition through the unexplored portion of the Beni River, over which there has always hung such an uncertainty and superstitious fear. But just before he reached this portion of his journey, the soldiers, whom he had hired and paid in advance for his whole expedition, intimidated by superstitious fear, suddenly presented their bayonets at the breast of Prof. Orton, refused to go any further, and returned home. Prof. Orton was, therefore, compelled to abandon his expedition, and returned almost heart-broken to die of weariness and disappointment on the legendary lake of Titicaca.

About three years ago, Dr. E. R. Heath returned to South America to complete, if possible, Prof. Orton's work, and explore this unknown region, the *terra incognita* of South America. It was hoped that some geographical society would aid in this important work, but while plans were being laid to secure material assistance, Dr. E. R. Heath undertook and solved the problem himself.

On December 28, 1880, Dr. Heath, of Wyandotte, Kansas, received a letter hastily written by his brother, dated Reyes, Bolivia, on the river Beni, Aug. 3, 1880, on the day of his embarkation for the rubber camps and the unknown country further below. He wrote that he was just setting out to explore this unknown region, and that three months would tell the tale of his success or defeat.

On March 19, Dr. Ivon D. Heath received another letter from his brother in South America, announcing that his expedition had proved a complete success. The following extract will be interesting from this letter, which is dated Reyes, Bolivia, Dec. 20, 1880:

"The question of the Beni is solved. This work of Prof. Orton is finished. I made the trip from Cabinas (rubber camps on the Madidi) in a canoe with two Indians. I left Cabinas September 27, and, after delays from sickness of my men, at 8 A. M., October 8, discovered a new river entering from the south, and at mid-day of the 8th arrived at the junction of the Madre de Dios with the Beni. No other white man has ever seen the mouth of this magnificent river. Crude measurements gave 735 feet for the width of the Beni, and 2,350 for that of the Madre de Dios. Took careful observations for latitude and longitude. At 6:50 A.M. of the 9th I passed the mouth of a river the size of the Yacuma, entering from the north, to which I gave the name Orton.

"At night we slept on a sand bar joined to a large island. On the 10th we passed this island, and at 8 A.M. another large one, and at 10 A.M. came to a line of rocks obstructing the river and making rapids. One mile further down we came to the main fall, which exhibits a perpendicular descent of the entire river of thirty feet. We occupied the remainder of the 10th in drawing our little craft over the rocks to the waters below. With much risk we passed the waves below the falls and camped. On the morning of October 11 we passed some rocks in the river corresponding to the rapids of the Palo Grande of the river Mamoré, but which, here, offer no serious obstructions to navigation. At 10 A.M., October 11, 1880, we arrived at the mouth of the Beni—that is, at the junction of the Beni and Mamore rivers. From thence we ascended the Mamore, 300 miles, to Exaltacion and Santa Ana, and from Santa Ana to this place, 200 miles west over the pampas; brought my boat on an ox cart.

"Here I am safe and sound, with a map of the three rivers—Beni, Mamoré, and Yacuma. From the river Madidi to the mouth of the Beni there are but four families of Pacavara Indians in the place of 'multitudes of man-eating savages,' as every man, woman, and child in Bolivia has believed during many scores of years. Rubber gatherers are already

taking advantage of my exploration, and have established camps further down the Beni."

On account of superstitious fear of the unexplored portion of the river Beni, the productions of the rubber camps on the river Madidi have ascended the river Beni, 200 miles to Reyes, thence east 200 miles to river Mamoré, thence 300 miles north to its union with the Beni—700 miles around, in place of less than 300 miles direct. The waters of the Beni come down from the gold mines of Bolivia and through forests of cinchona trees; and the Madre de Dios from a much larger area of similar territory of Peru.

Dr. Heath, alone, unaided, spent two years in patient, determined preparation near the scene of the proposed exploration, and then, in a frail canoe, with only two Indian servants, with certain death before them, as all Bolivia believed, paddled bravely forth to explore a great river and extensive country where, during 350 years, a score of costly expeditions have disastrously failed. It is thought that the governments of Peru and Bolivia will give official recognition of his daring and successful achievement. His work will develop and change the commerce of many hundred miles of mountain and plain. Rubber and bark will now descend the Beni, instead of going 600 or 700 miles around. What risk and danger he faced in descending an absolutely unknown river, larger than the Mississippi, in which were rapids and falls! What satisfaction he must have felt when his canoe entered the yellow waters of the Mamoré, having successfully braved the superstition of ages and opened up a new country to commerce!

Dr. Heath has achieved a noble work in exploring this unknown region, which will be recognized everywhere, and as long as the Orton river flows, men will remember the explorer whose name it bears, who contributed so much to our knowledge of South America, and gave up his life to the cause of science.—*Kansas Review.*

Making Cushions.

The following is given in answer to a number of questions asked us by a correspondent on the method of making cushions, and may be of benefit to others of the craft.

Lay off the bottom in blocks, but in doing this, consider the flare of seat, so as to have the side and back blocks somewhere near the size of the middle ones. When this is done and the facings are shaped out, lay the facings to the bottom, and draw the bottom lines across them, and when the bottom is sewed to the facing, these lines must come together. You must cut your facings a little smaller than the bottom, and cut the bottom a little larger than the seat board. This will prevent you from drawing the bottom when sewing to facing. Next, make a frame out of five-eighth inch poplar, one and a half inch wide, and have the frame a little larger than the cushion top. Draw unbleached muslin over the frame, and paste another piece over this. When dry, draw a red line for the front part of the cushion; lay the bottom within one-quarter inch of the line. Mark at each tuft line, and whatever the flare is, allow three-eighths inch on the sides and back. When this is done, take the bottom off and draw the tuft lines on the frame. Take small bench awl and put through the tuft marks and draw across over the hole on the other side. This will show you where the tufts are to go.

Next lay the cloth off; there are several ways of doing this, but we will speak of two only. Lay cloth on bench with nap toward you, give each block five-eighths inch fullness lengthwise and one-half inch crosswise. Allow plenty of stuff around the edges, say one and one-quarter inch, punch a small hole for the tuft, and crease with a hot iron on the wrong side along the chalk lines. If the cloth is heavy, it will not require lining, but paste a small muslin stay under the tuft. Lay a layer of thick wadding over the cloth, put a little paste on each tuft, but none on the edges.

Next lay hair on the frame, a thin layer at a time, and do not press it, but let it lie loose, about four or five inches high. Lay the cloth over this, and tack with needle and thread at each tuft line. When this is done, take cushion needle and thread and tuft the cloth down, making each one single, and drawing down close to the muslin on the frame. Now take small round awl or tufting needle and work the blocks in shape. It is not necessary to be particular with this part, nor have them stuffed too full. Do this when the bottom is stuffed.

Sew down the edges with a back stitch, and draw the cloth tight; that is, do not have too much fullness, or the top, after it has been sewed to the facing, will look bad around the edges. Sew close to the lines on the frame, and wherever there is a weak place, push a little hair under it. Paste the muslin over the cord, and when dry trim off to suit one and one-eighth inch cover, basting the cord to bottom of facing and the fall to this, and then sew the bottom in.

Now turn and beat the corners out, also along the front. Turn it again and baste cord to top of facing. Be particular to have the nap of cord cover to run the same as the cloth on the front. Cut the top from frame, allowing one-quarter inch, and tack it with thread to the tuft line at the corners. If there is too much fullness at the corners, you must work it out. Leave the mouth open from the corner tuft line at the back, turn the cushion and cord at the corners, and also along the back; tack out, and fill the front corners with cotton; then sew the mouth up to within twelve inches.

Stuff the bottom up firm, being careful to keep the stuffing to the front, and when you think the bottom is well filled, feel along the front, and if the stuffing has worked away, run the stick along and work it to the front. When this is right tack the mouth to the cord with thread at the tuft lines, and draw the tufts in regular, commencing with the front row, and then sew the mouth up. Leaving the mouth open until the tufts are in keeps the strain from the cloth, and you have a chance to fill in more hair if necessary.

We will now give another way of cushion tops. Work the bottom, facings, and cord the same as the way explained above, and the frame also, as the difference is only in laying off the cloth, a less quantity of hair being laid on the frame. Take the cloth and spread it out on the bench with the face side up, the nap toward you. The bottom is laid off for tufts; lay this on the cloth, with one of the lines on the crease in cloth, allowing one inch fullness on the front. The French chalk and mark at each line from the bottom. Allow the same fullness around the edges as in the former. Take the bottom off, and draw the lines on the cloth. Thread and shuttle bobbin with "C" or "D" silk (Singer), using the same on top; fold the cloth to the chalk line, the long ones first, and stitch close to the edge. After the three long lines have been stitched, do the cross lines in the same way. Do not have the silk break in between the tufts; if there is a knot in the silk rip out the tuft. After stitching, flatten down at the tufts. Now work up this top the same as the one explained above.

This makes a pretty top, but if you do not wish to stitch it, take one-sixteenth inch fullness from between tufts, and leave the top plain; but in each case work the top the same. If you stitch the cushion top, do not back the same; if you pleat the top, pleat the back the same.—*Carriage Monthly.*

Seventy Miles an Hour.

The Philadelphia *Record* of May 12, gives the following account of a run from Philadelphia to Jersey City by a Pennsylvania train drawn by locomotive No. 10.

The train from Washington was fifteen minutes behind time in reaching the West Philadelphia depot, where the big, new locomotive adoringly named by rail-roaders "long-legged 10," was snorting under an enormous steam pressure. The Washington section was soon added to the other cars and a string of seven cars started out of the depot on a gentle roll. As the last car swung around the Zoological Garden the speed had increased to twenty miles an hour, and as the wheels turned to cross the northern end of the city the mile-posts commenced to pass at the rate of one in two minutes. When Frankford was reached the trees and fence posts seemed to skip back with increased speed, and the register showed forty-five miles an hour. Then the engineer, patting his pet on the throttle let loose his hold and the big thing started out to make up for lost time. Schenck's Station was passed at the rate of sixty-five miles an hour, but so easy was the riding that none of the 400 passengers knew they were shooting over the ground at the pace of more than one hundred feet a second. As Bristol was sighted the train slowed up with a series of jerks, and passed the station at what seemed to the passengers to be a lazy swing, but which was, in fact, a speed of forty-five miles an hour. For a few minutes there was no perceptible change in the rate, except perhaps that a gentle pull showed the locomotive was improving its time. Tullytown whizzed past at a sixty mile pace. All this while the traveling was up grade. As Trenton was sighted the mile-posts came along in fifty-seven seconds; the bridge over the Delaware was crossed, and Trenton was entered at the rate of forty miles an hour. Four of the lost fifteen minutes had been gained on the stretch from Philadelphia, and after a stop of two and a half minutes to take in passengers the big thing moved off again across the country. It was now a difficult task to pass from mile post to post in less than eighty seconds. After the third mile had been reached the time between posts fell to seventy seconds. Lawrence was passed at a sixty mile gait, and Princeton Junction followed at the same pace. Then the speed increased to sixty-five miles an hour until Monmouth Junction was reached. Here the big engine was slowed down to fifty-five miles while taking up water from a track tank; then twelve miles were gone over in twelve minutes. Down grades now helped to accelerate the impetus of the huge mass, and the mile posts before reaching New Brunswick flew by in fifty-five seconds. At New Brunswick quite a crowd was gathered at the depot to see the monster engine whizz through the city at the rate of forty miles an hour. Menlo Park danced by with a sunlight flash from the row of glass globes covering the electric lamps that line the track, and within the next five minutes the speed of the train increased on a straightaway dash to seventy miles an hour. Rahway, Newark, and the Meadows were skimmed over, and the immense train dashed into the depot on time, having covered eighty nine miles in ninety-five minutes, being an average of fifty-six and a quarter miles per hour for the entire distance, stops inclusive.

Iridium.

Last week we gave a brief notice of the new process of Mr. John Holland, of Cincinnati, Ohio, for fusing and moulding iridium. The following additional particulars we take from the specification of the patent therefor, granted May 10, 1881:

Iridium is rarely found pure, and only in dust and very small grains or scales. By reason of its non fusibility by the ordinary processes it is practically useless, except for pointing gold pens, and as found there is but a small proportion of it large enough to be used with advantage for even this purpose. I have also used it in its natural state, and, as usually found, alloyed with osmium (iridosmium, which is much softer than pure iridium), for pointing my fountain pens, and have experienced much difficulty in obtaining grains or scales large enough for this purpose, and many of these were imperfect, having cracks or fissures in them that rendered them worthless for drilled fountain pen points. The pieces as obtained are also of irregular shape. A large portion of the metal must, therefore, be wasted, as the dust which results from grinding the grains to the proper shape was of little use.

By my present invention I am enabled to fuse the dust as found in its natural state, whether pure or combined with other metals, into a molten mass, and mould the metal into ingots of any desired shape or size. I accomplish this result by the following process: The metal (preferably the dust, which, being of little use in the arts, is comparatively inexpensive) is put into a sand crucible and subjected to a high heat in an ordinary furnace. When it has attained a high temperature I add to the metal about one-fourth its weight of phosphorus. After the addition of the phosphorus the metal quickly fuses, when it may be poured into moulds of any shape or size. I find it best to have the moulds highly heated, as the metal chills and sets quickly. So soon as the metal is set I place it in a crucible with chalk or lime, return it into the furnace, and again subject it to a high heat. This eliminates the phosphorus, leaving the metal pure, hard, and non-fusible, as in its natural state.

I prepare the metal for my fountain pen points by casting it upon a flat metal plate, the surface of which is crossed by fine ribs, resembling lattice or net work. I pour the molten metal on this plate, filling the interstices between, and covering the ribs. The metal is thus cast in a thin sheet or plate having one of its faces grooved the reverse of the ribs upon the mould. Through these grooves the plate is broken into small cubes the proper size to be drilled and formed into fountain pen points. The same plan may be adopted with advantage in preparing journal bearings for watches to be used in place of the jewels now commonly used.

For pointing my gold pens I mould the metal into the form of wire or small rods. These I break into pieces of a size to make strong substantial nibs. The metal may also be cut by using a copper wheel or disk and diamond dust.

As the metal is exceedingly hard, non-fusible, practically non-corrosive, and capable of receiving a high polish, it will now be seen that I have discovered a mode of working it, supplying a great need long felt in many branches of the arts.

The metal is made much tougher by eliminating the phosphorus, but it may be used for many purposes without so doing.

Agricultural Notes.

SUNFLOWERS.

One of the best products in a small way is the sunflower. They occupy but little room, and are to most persons ornamental. They may be sown at any time after the 10th of May. The mammoth Russian is the largest and most productive variety. A single flower will produce a large quantity of seed. Although it well repays care it may be grown along fences, where other plants are not easily cultivated. Leave one stalk on a hill. The seeds are excellent for stock as well as for poultry, the leaves may be fed green to cattle, and the dry stalks will serve to light the kitchen fire.

RADISHES.

Radishes must be grown quickly or they will be tough, stringy, and bitter. If forced by a daily sprinkling of liquid manure they will be very brittle and tender.

STRAWBERRIES.

"S. R." says in the New York *Herald:* Set the plants in rows three and a half feet apart, with eighteen inches between the plants. Do not let them get too thick, but it is better to let them mat than to trim them. It is better not to pick the Wilson strawberry too soon. It will hang for several days after turning red.

The Utilization of Worn Out Horses.

The utilization of horses not fit to eat and too old to be of working service, in France, is said to be as follows:

It is first shorn of its hair, which serves to stuff cushions and saddles; then it is slaughtered and skinned; the hoofs serve to make combs. Next the carcass is placed in a cylinder and cooked by steam at a pressure of three atmospheres; a cock is opened, which allows the steam to be run off; then the remains are cut up, the leg bones are sold to make knife handles, etc., and the coarser, the ribs, the head, etc., are converted into animal black and glue. The first are calcined in cylinders, and the vapors when condensed form the chief source of carbonate of ammonia, which constitutes the base of nearly all ammoniacal salts. There is an animal oil yielded which makes a capital insecticide and a vermifuge. To make glue the bones are dissolved in muriatic acid, which takes away the phosphate of lime; the soft residue retaining the shape of the bone is dissolved in boiling water, cast into squares, and dried on nets. The phosphate of lime, acted upon by sulphuric acid and calcined with carbon, produces phosphorus for lucifer matches. The remaining flesh is distilled to obtain the carbonate of ammonia; the resulting mass is pounded up with potash, then mixed with old nails and iron of every description; the whole is calcined and yields magnificent yellow crystals—prussiate of potash, with which tissues are dyed a Prussian blue, and iron transferred into steel; it also forms the basis of cyanide of potassium and prussic acid, the two most terrible poisons known in chemistry.