

b) being only half the size of that of the female (Fig. 1, e, and Fig. 3, c).

The Imago or Perfect Insect.—After a lapse of about three weeks from pupation a still greater difference between the two sexes becomes apparent. The male chrysalis works its way to the lower end of the bag and half way out of the opening at the extremity. Then its skin bursts and the imago appears as a winged moth with a black, hairy body and glassy wings (Fig. 1, d). It is swift of flight, and, owing to its small size and transparent wings, is rarely observed in nature. The life duration of this sex is also very short. The female imago is naked (save a ring of pubescence around the end of the body of yellowish white color) and entirely destitute of legs and wings (Fig. 1, c, and Fig. 3, b). She pushes her way partly out of the chrysalis, her head reaching to the lower end of the bag, where, without leaving the same, she awaits the approach of the male. The manner in which the chrysalis shell is elongated and reaches to the end of the bag is shown in Fig. 3, a, and an enlarged side view of the female, showing the details of structure, is shown at b in the same figure. The extensibility of the male genitalia, which permits him to reach the female within her bag, is set forth in the accompanying Fig. 4, where the parts are shown at rest, c and d, and in action, b. Fertilization being accomplished, the female works her way back within the chrysalis skin and fills it with eggs, receding as she does so toward the lower end of the bag, where, having completed the work of oviposition, she forces, with a last effort, her shrunken body out of the opening, drops to the ground, and perishes. When the female has withdrawn, the slit at the head of the puparium and the elastic opening of the bag close again, and the eggs thus remain securely protected till they are ready to hatch the ensuing spring.

THE CONDOR OF THE ANDES.

By S. L. CLAYES.

AMONG the raptorial, or rapacious birds, the condor holds first rank by reason of its enormous size and unparalleled voracity. It is found along the whole chain of the Andes, through Mexico, Chile, Peru and Patagonia to the Straits of Magellan, and Lewis and Clarke claim to have seen it even among the Rocky Mountains, near the source of the Missouri. But the Andes of South America is the native habitat and stronghold of these birds. They are most abundant in Chile and Peru, though even there they are not found in flocks, three or four being as many as are usually seen together. They have sometimes been called the great vultures of the Andes, and in many essential particulars they resemble the vultures of the Eastern Hemisphere.

When the bird was first seen by the Spanish conquerors of the New World, its strength and bulk so impressed them that imagination was aroused, and they likened it to the rook of Arabian story, some even claiming it to be identical with the famous bird "which is able to truss an elephant." Putting aside these romantic statements, even among naturalists of repute there were once the most exaggerated stories current in regard to its size. Eighteen feet were gravely given by De Marchais as the actual measurement from tip to tip of the extended wings of a condor. "A width so enormous," he says, "that the bird can never enter a forest," and declares that a single one will attack a man or carry off a stag. Garcilasso states that there were some condors killed by the Spanish in Peru which measured fifteen or sixteen feet from the point of one wing to that of the other, and claims that there is a certain tribe of Indians which adores them. He adds that two will attack, overcome and devour a bull, and that a single bird will kill a boy of twelve years old. As Veillot justly says: "It was with the condor as with the Patagonians—both shrank before examination." Even Buffon exaggerated their size.

While observation has modified earlier reports, condors are still acknowledged to be the largest of known flying birds. Humboldt confesses that at first they appeared to him to be of colossal size, but says that an actual measurement corrected the illusion. He found none that exceeded nine feet in stretch of wing, and was assured by many inhabitants of Quito that they had never shot any of more than eleven feet. But this is less than the estimate of Tschudi, an accomplished zoologist and most careful and reliable authority, who in one place gives the wings an expansion of "from twelve to thirteen feet," and in another says: "I measured a very large male condor, and the width from the tip of one wing to the tip of the other was fourteen English feet and two inches, an enormous expanse of wing, not equaled by any other bird except the white albatross." But far from "trussing an elephant," Tschudi asserts that it is impossible for the condor to lift even so large a creature as a sheep from the ground, assuring his readers "he cannot when flying carry a weight exceeding eight or ten pounds." An old male condor belonging to the Zoological Society of London, which was considered a very fine specimen, measured eleven feet from tip to tip of his outstretched wings and four feet nine inches in length. Darwin, in his "Voyage of a Naturalist," writes of the first he shot: "It measured from tip to tip of the wings eight and a half feet and from beak to tail four feet."

Despite its immense size and weight the condor possesses the power of rising in its flight to a greater distance above the earth than any other bird; and Darwin speaks rapturously of its grace of motion on the wing. "When the condors are wheeling in a flock, round and round any spot, their flight is beautiful. Except when rising from the ground, I do not recollect ever to have seen one of these birds flap its wings. Near Lima I watched several for nearly half an hour without once taking off my eyes; they moved in large curves, sweeping in circles, descending and ascending, without giving a single flap. It is truly wonderful and beautiful to see so great a bird, hour after hour, without any apparent exertion, wheeling and gliding over mountain and river." Humboldt claims that it soars to an altitude of at least twenty thousand feet above the sea. From the Cave of Autisana, which is at an elevation of 12,958 feet above the Pacific Ocean, he observed a condor rise perpendicularly to a still greater height of 6,876 feet. Other authorities state that it reaches a height of six miles above the sea level,

which is about six times the height of the ordinary clouds.

The bird from flying at this extreme elevation, where the air must be so highly rarefied, will drop suddenly to the valleys, thus in the briefest time passing through an almost incredible change of temperature. At such a height the air cells of the condor, when they have been filled in the lower regions, must be inflated in the most extraordinary manner. But the great bird loves the heights. They are his chosen home. Hunger alone drives him to the plains. As soon as his appetite is satiated he leaves them, appearing to be oppressed by the higher temperature and increased weight of the atmosphere, and returns to regions far above the clouds, where the air is so rarefied that a man can hardly breathe. High up as the eye can reach he may be seen describing his graceful circles against the blue. From this or even a more lofty point of vantage, he brings his telescopic eyes to bear upon the earth, eagerly scanning the movements of the herds for the fall of some weakening member of the flock. No sooner does a poor creature drop than down rush the condors to the feast.

In spite of the keenness of a hunger sharpened by one knows not how many days of watching upon the wing at that frigid altitude, our condor begins his repast daintily, tasting first the eyes and tongue, his chosen tid-bits. But soon, fired by the sight of the beautiful banquet which death has spread for him, he tears the tough hide, and, wildly pulling with his beak, pushing with his feet, and flapping his wide wings, gorges himself, gulping down great bits of flesh, and riots without stint until he can hold no more. Fairly drunken with his revolting feast, he no longer has power to raise himself upon the wing. Knowing this, the Indians will often place a dead animal as a lure upon the plains. When the birds have become gorged and unable to fly, the Indians appear and noose them with a lasso, a sport they find scarcely less exciting than the Spaniard does his bull fight.

So great is its tenacity of life that "when a condor is caught there is a fight, and a stout one, before it is killed," says an eye witness. Humboldt, who was present at the killing of one, tells that after having strangled it with a lasso the Indians hung it by the neck upon a tree, pulling vigorously upon its legs. When at length they took it down, apparently quite dead, "the bird got up and walked off as if nothing had happened. Then a pistol was fired at it, the man who fired standing within less than four paces. Three balls hit the living mark, wounding it in the neck, chest and abdomen; the bird kept its legs. A fourth ball broke its thigh. Then the condor fell to the ground, but did not die of its wounds till half an hour had elapsed."

The earlier tales of the condor's powers seem, like those of his size, to have been greatly exaggerated. Now the birds are no longer credited with particular ferocity. It is even claimed that their talons are not formidable, being too weak to seriously lacerate; that the natives do not fear them; that the little Indian children play about their parents while their fathers are engaged in collecting snow for sale in towns; that the babies with their parents sleep in safety in their near vicinity, and we have the assurance of Humboldt that he never heard one of them had been attacked or killed. He tells us, however, that two of the birds might prove dangerous if opposed to one man. Sir Francis Head's tale of the fight of a Cornish miner of his party with a condor proves that a man can conquer one. Still, Sir Francis reports the man to have declared that "he never had such a battle in his life; that he put his knee upon the bird's breast and tried with all his strength to twist its neck, but the condor, objecting to this, struggled violently, and as several others were flying over his head, he expected they would attack him. At last he succeeded in killing his antagonist, and with great pride showed me the large feathers from his wings; but when the third horseman came in, he told us he had found the condor in the path, but not quite dead." Darwin states on the authority of the Chilean countrymen that "the condor will live and retain its vigor between five and six weeks without eating."

The condor builds no nest, but choosing some isolated crag which towers thousands of feet above the level of the sea into the regions of perpetual snow, it there deposits two eggs upon the bare rock. The eggs are three or four inches in length and white as the purest ivory. After an incubation of about sixty days the young condor is hatched quite bare of feathers, its body being covered for several months with a whitish down, or frizzled hair, something like that which we find upon young owls. This down so exaggerates the size of the condor chick as to make it appear nearly as large as an adult. Darwin writes: "It is said that the young condors cannot fly for an entire year, and long after they are able to do so they continue to roost at night and hunt by day with their parents."

The young birds are of a brownish tint, while the general color of the mature birds is black, being brightest in the older males. This fact gave rise to a mistaken belief which was at one time current that there were two species of condors. The feathers, with the exception of the wing coverts and the secondary quill feathers, are a bright black, generally mixed with a grayish tinge. The wings are long and extremely powerful, the quill feathers measuring from two to three feet in length. The wing coverts in the females are blackish gray; in the males they are white at the points and frequently for half their length, often enabling one to thus distinguish the sexes at some distance. In both male and female the secondary quill feathers are white on the outer side. Ulloa asserts that "in the colder parts of Peru the skin is so closely covered with feathers that eight or ten balls may be heard to strike without penetrating its body." Both male and female wear about the lower part of the neck a ruff of light, downy feathers, marking the line of separation between the naked skin and the densely feathered parts below. The head and neck, wholly bare of feathers, are covered with a hard, coarse skin, deeply wrinkled and folded upon itself, of reddish-brown color, upon which some dark hairs are sparsely scattered. In the male the head is crowned with a sort of comb, firm, oblong in shape, and covered with the same rough skin as is the

head. It lies along the beak, nearly to its extremity, covering the large oval nostrils, but it is so unattached at its lower end as to permit a free passage of the air for breathing. The male also bears upon its neck a loose membrane or wattle, similar to that of the turkey, and like it, capable of being dilated at the pleasure of the bird. The skin of the neck is ridged by deep parallel folds, produced by a habit which the condor has of retracting its head when at rest as to give the impression that it has no neck. The beak of the condor is massive and strong, ash-colored and straight at its base, but sharply arched toward the point, where it terminates in a strong, well-curved hook of nearly ivory whiteness. The bluish-gray legs are extremely heavy and powerful. The toes terminate in black talons, which, though long and thick, are only slightly curved; the hinder toe, too, while somewhat more curved than the others, is wanting in strength, which renders the foot weaker in its power of grasping than that of any other bird of its order.

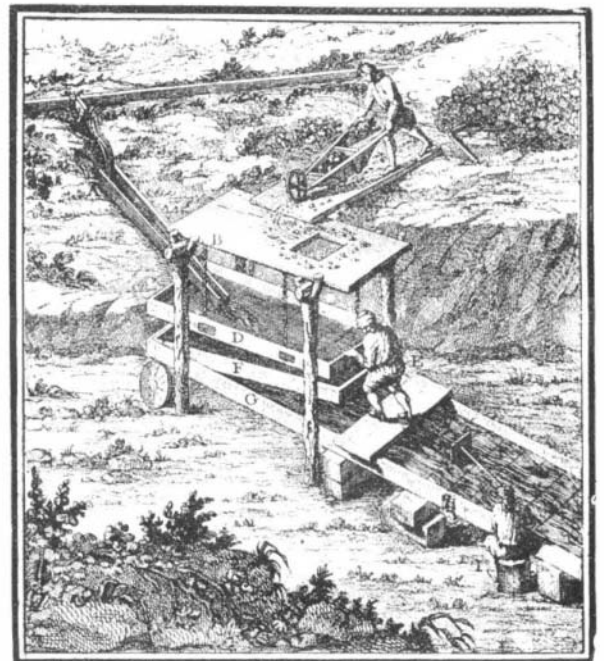
Laying aside the prejudice produced by its habits, we cannot but acknowledge that in appearance the condor, while heavier than the eagle, and less graceful in its movements when not upon the wing, is far from unattractive to the eye.—*Popular Science News*.

THE GOLD DEPOSITS OF THE PYRENEES.

IN a very interesting work entitled *Les Pyrenees*, recently published by Mr. Eugene Trutat, the author, *apropos* of the varied mining wealth of our country, calls attention to the auriferous deposits found therein. The question is of a genuine geological interest.

While, in fact, we find gold commonly in the sand derived from the Ariege, the Salat and the Garonne, and while in the extent of country comprised between Campagnac and Averdun all the ravines and brooks that empty into the Ariege are auriferous, it has hitherto always been impossible for any one to find *in situ* the rock whence the precious metal is derived. And yet this gold is far from existing in negligible quantity. In fact, according to Mr. Pailhes, an observer of the last century, there have been found between Varilhès and Pamiers spangles, or small *pepitas* rather, weighing as many as fifteen grammes.

At present, however, it seems that the deposits are



GOLD WASHERS TREATING AURIFEROUS EARTH.

A, flume leading water to the riddle; B, platform upon which the earth is deposited; C, laborer bringing the earth; D, riddle for washing the earth; E, laborer acting the riddle; G, washing table; H, table covered with cloth on which the washing of the earth is finished; I, laborer stirring the deposit on the cloth-covered table. (From an old engraving taken from Baron Dietrich's work.)

greatly impoverished, so that the gold washers, formerly numerous in the country, have almost completely disappeared.

This industry of the gold washers, as it was carried on a century ago, while it was still flourishing, was, moreover, an interesting practice.

A writer of the time, Baron Dietrich, in his curious work entitled *Description des Mines de Minerai, des Forges et des Salines des Pyrenees*, published in 1786, has left us some precise data upon the various methods of treatment in use among the gold washers in the county of Foix in order to obtain spangles of gold.

"The first of the methods of the gold washers of Pamiers," says he, "is the most general. The second is employed only for the very fine spangles. Yet the use of it is unfortunately very rare.

"They make use of three instruments in the first method, to wit:

"(1) A shovel called *andusa*, 9½ inches in length by 7½ in width, having the edges turned up at the sides by about four lines. This shovel serves to remove the large pebbles that cover the finest gravel as well as the sand, which the washers dig into successively until they come upon a finer part intermingled with those masses of pebbles called the *balme*. This operation produces holes upon the banks. They employ the same shovel for putting this fine gravel and this sand into the *greffane* or *gressale*.

"(2) The *greffane* or *gressale*, a sort of wooden plate of a foot and six to nine inches in diameter, hollowed out in such a way that it has a depth of about three inches in the center. It is into this plate that they put the sand and pebbles together. The largest of these pebbles scarcely exceeds an egg in size, because they throw aside with the *andusa* those that are larger.

"The plate being filled with gravel and sand, the men go barefooted to a distance of a few feet in the river or brook.