ECLECTIC SCHOOL READINGS

STORIES OF ANIMAL LIFE

NEW YORK · CINCINNATI · CHICAGO
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OF

ANIMAL LIFE

BY

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Author of "Elements of Zoölogy"

NEW YORK ·:· CINCINNATI ·:· CHICAGO
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STO. AN. LIFE.

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PREFACE.

THESE stories of nature, derived mainly from personal experience with the various animal forms described, are presented in the hope that they may prove an incentive to the young student of zoölogy or animal life, either creating an interest in the subject or serving as supplementary reading to those who have followed a course in the field or the text-book.

To undertake the study of natural history successfully, enthusiastic interest is necessary, and to arouse such an interest may be considered one of the possible good offices of the volume. The young student who is confronted day after day with a frog, a crab, or a shell, and requested to note its peculiarities of structure as a first lesson, sometimes may assume that natural history is, after all, very dry and uninteresting, when, had he even a faint conception of the wonderful ways and habits of the animals, he would eagerly embrace the opportunity for closer investigation.

This volume is intended to present some of the remarkable phases of animal life, and it is hoped that the reader will find under the guise of stories many facts not generally available and covering a wide field.

The illustrations have been designed to carry out still further the idea of the book, and to present at once the

more interesting and striking features of the various animals under consideration.

Some of the chapters, as "How the Whale Looked Pleasant," "The Famous Tortugas Bullfight," "Jack and Jill Reynard," and others, appeared originally in "St. Nicholas" (published by the Century Company), a few in the "Youth's Companion" and the "Outlook," and nearly all are based upon personal experiences of the author in many localities, from the coral lagoons of the Gulf of Mexico to the islands of the Pacific.

PASADENA, CAL. C. F. H.

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STORIES OF ANIMAL LIFE.

THE LITTLE BEAR'S STORY.

"I AM a native of the state of California. I don't remember distinctly where I was born, but it was up in the Sierras, where the snow lies in great banks, and the giant trees stand like sentinels, and where you might travel for days and weeks and meet no one but bears.

"The first thing I recollect is finding myself in a big burrow covered with snow. Then my mother broke the way out, and led us (I had a brother) down the mountain. We soon left the snow; and I remember one day, at sunset, we stood on an overhanging rock, and my mother showed us the green valleys and dark forests where

we could hide, and far off was the gleaming sea. She did not care very much for the water, I think.

"My mother was hungry after the long winter fast, and every day she took us lower and lower, until, one night, she led us into a sheep ranch. Then our troubles began, for she left us to catch a lamb, and never came back. We heard all about it afterward. Some ranchers had seen her, and rode out on horseback to enjoy the cruel sport of 'roping a bear.' As they rode around her, one threw his lariat about her neck, another caught her forefoot as she stood up, another her hind leg; and then they dragged her away to the ranch house — and so we became orphans.

"It was not long before the dogs found us, and a man carried me home in a basket to his wife, who treated me very kindly. I did not like it, but pretended I did, and ate all I could, always watching and hoping for a chance to run away to my mountain home. My mistress, however, soon thought I was too knowing, and put a chain about my neck. Finally, when I was about four months old, they sent me to a friend in San Francisco. I shall never forget how the people looked at me and laughed when I stood on my hind legs. As it there was anything laughable in that!

But they gave me sugar and other good things, and I fared well.

"My new master was a butcher, and most of the time I passed in his shop. But some days, when I was very homesick, and longed for my mother and the little cub who had been carried off I did not know where, the butcher's wife would take me into her room back of the shop; and then I would go to sleep, cuddled up close upon a rug, with my paws on her hand, and dream that I was back in my mountain home.

"One day I heard my master say I was to be photographed, and I thought my time had come. You see, I had never heard the word before. There was no escape, as I was kept tied; and the next morning my master took me under his big coat in the cable cars. I could just peep through one of the buttonholes, and all at once I uttered a loud whine. You should have seen how the passengers stared at my master, who, I knew, looked embarrassed, as he gave me a tremendous squeeze. We soon got out, and I was carried up a flight of stairs, and placed on a table in a room, the walls of which were covered with pictures of people's faces, all of which seemed to keep their eyes fixed on me.

"My master petted me and gave me some sugar, and I began to think that being photographed was

possibly not so bad, after all. Presently a man came in. He looked very much astonished, and said: 'Why, I thought you engaged a sitting for "a descendant of one of the early settlers"?'

"'So I did,' replied my master; 'there it is'— pointing to where I stood up, blinking with all my might.

"'Why, it 's a cub bear!' exclaimed the man.

"'Well, it is a relative of some early settlers, all the same,' my master answered.

"At this the man smiled good-humoredly; then he went into another room, while my master petted me and gave me so much sugar that I had the toothache from it. After a while the man came back and said he was ready, and I was taken into a room where there was a big thing like a gun on three legs, with a cloth over it. My master sat down in a chair and held me in his lap, while the man pointed the gun at us.

"I thought I was to be shot, and tried to get away; and this made the man so cross that he came out from under the cloth and said he could n't do it. Then my master put me up in a child's chair, and propped something tight against my head, at which they both laughed so loud you could have heard them in the street, and I jumped down.

"Finally the man tapped his forehead and said:

'I have it.' He put a screen before the gun, and my master set me on top of it, holding my chain, while the man crept under the cloth. I did not dare move, as I was astride of the screen, my hind feet hanging in the air. I prepared for the worst. Then the man came out again, looked at me sharply, and turned my head a little, telling me to look pleasant — at which my master laughed. The man next shook a tambourine at me, and as I turned to see what the noise meant, I heard a click! and just then my master took me down and carried me home, much to my relief.

"I wondered what it was all about until, one day, my master took me on his knee, and, holding up a card, said: 'Well, here you are!' And what do you suppose it was? Nothing more or less than my picture, just as I was perched astride the screen the day when I thought I was going to be killed!"

THE FESTIVAL OF EGGS.

KAITAE was just sixteen years old. It was his birthday, and he rose bright and early, and was abroad before any of his companions; for, exhausted with the games and contests of the previous day, they were sleeping heavily in the curious

caves or stone houses that even to this day mark the location of Orongo.

Kaitae was a prince, the lineal descendant of King Kaitae of Waihu, the strange volcanic island in the Pacific, better known as Easter Island.

The young prince, stepping lightly over two sleeping comrades, stole out of the cave, and with a joyful heart bounded away. For some distance he ran quickly; then, coming to a large platform of stone, he stopped near a group of curious objects.

The sun was just rising over the sea, seeming to Kaitae to illumine the scene with a mysterious radiance. He stood upon the side of an ancient volcano, the steep slope of which fell precipitously a thousand feet to the sea; and before him were many gaunt, staring faces of gigantic size, rudely carved in lifeless stone, their enormous eyes turned to the north. The great heads alone appeared, as if the bodies were embedded in the hardened lava that formed the base of the outer slope of the famous

"He reverently touched one."

volcano Rana Roraka. The youth gazed long and wonderingly at them, as in his mind they were associated with the gods, and he reverently touched one, being able just to reach its huge lips.

Kaitae was a bright boy, with long, dark hair, and brilliant, piercing eyes, and he presented a strange contrast to the wonderful old face that looked so steadfastly to the north. What was it looking at? what did it see? he asked himself; and climbing up to the brink of Rana Roraka, he gazed steadily to the north, then, turning, peered down into the vast crater of the volcano. The great abyss was nearly circular, a mile across, and its sides were deeply jagged. On the slopes, halfway down, were other faces, lying in confusion, as if they had been hurriedly left, or had been thrown down by some convulsion of nature.

Kaitae had heard from his father that in ancient times Tro Kaiho, a son of King Mohuta Ariiki, had made the first of these images. Here they had been for ages, for all he knew, marking the spot where the remains of his ancestors lay.

Kaitae, however, was not abroad so early in the morning to study these strange monuments of his ancestors. It was a famous holiday time,—the Festival of the Sea Birds' Eggs,— and the entire

male population of Waihu had gathered at Orongo to celebrate it. The festival was an ancient custom, and the stone houses of Orongo had been built long in the past by these people to shelter them during this season.

The festival consisted of a race for the first gull's egg deposited upon the islands of Mutu Rankan and Mutu Nui, mere volcanic rocks, which peered above the surface a few hundred yards from the rocky shore of the island of Orongo. The object was to reach the island first, secure an egg, and bring it back in safety. The one who accomplished this was greeted by the entire community as a hero; and, more important yet, the return with the unbroken egg was supposed to bring with it the approval of the great spirit Meke Meke, and the fortunate one was the recipient of many gifts from his fellows throughout the ensuing year.

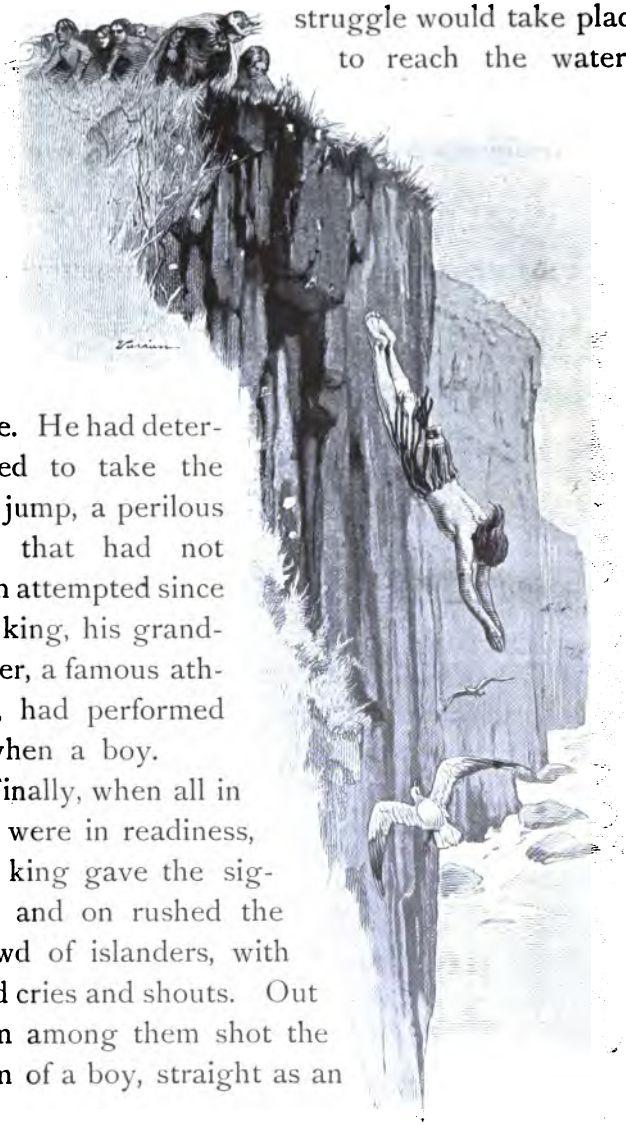
There was keen rivalry among the young men and boys, and Kaitae had determined this year to be the first to discover the gulls on the islands. Running down the slope of the volcano, past the great stone images weighing many tons, he made his way quickly to an observation tower, about thirty feet in height, resting upon a platform of rock over the tombs of his people. Here, in the season, the men watched for turtles and signaled to their

fellows. From the top of this lookout Kaitae gazed over the blue water. There were the little islands below him, and — yes, about them hovered numbers of white objects, the long-looked-for gulls, which evidently had arrived during the night. With a joyous shout Kaitae sprang down, and was soon bounding over the rocks to convey the news to the natives. At once they came swarming out of their stone burrows like ants, and before long began to move in the direction of the coast. When all had gathered at the cliff, the king addressed them, repeating the time-honored rules for the race.

At his word they were to start for the island, and the one who returned to him first with an unbroken egg would have the especial favor of the great spirit Meke Meke.

The band of excited men and boys stood in various expectant postures, some with one foot in advance, others with arms eagerly stretched to the front, ready for the word from the king.

Kaitae stood near his father, his eyes flashing, and determination expressed in every feature. He had decided upon a dangerous course. The cliff where the start was made was a precipitous, jagged wall rising far above the sea, and breasting it with a bold front. From it numerous paths led down to the water; and Kaitae knew that many a fierce



struggle would take place to reach the water's edge. He had determined to take the cliff jump, a perilous feat that had not been attempted since the king, his grandfather, a famous athlete, had performed it when a boy.

Finally, when all in line were in readiness, the king gave the signal, and on rushed the crowd of islanders, with loud cries and shouts. Out from among them shot the form of a boy, straight as an

arrow, his long black hair flying in the wind — not to the lower beach, not to the narrow trails made by his ancestors, but directly to the brink of the precipice. The train of dusky figures paused breathless, and the king ran forward to see Kaitae dive out into space and gracefully disappear into the depths below. Up he came presently, a spot on the water, and before the astonished natives could recover from their excitement he was far on his way to the island.

Down the narrow trails worn in the lava swept the crowd, pushing one another over in their rush to the shore, diving, leaping, and hurling themselves into the sea, in eager endeavor to reach the island. But Kaitae was far in advance, and before the crowd of egg-seekers were halfway over he had gained the rocky point of Mutu Nui, and amid the threatening cries of the birds had clambered up. Dozens of speckled eggs were strewn about. Seizing one, Kaitae placed it in his mouth as the safest place, and, springing again into the water, was homeward bound.

No one seemed discouraged because Kaitae was ahead. A hundred accidents might yet befall him. The current was strong against the return; the egg might break — it generally did; he might slip on the rocks in the quick ascent; he might be in-

jured, even killed — such things had been known. So the contestants swam on, and soon scores of dark forms could be seen crawling out of the water over the kelp-covered rocks, slipping, sliding, falling; then darting this way and that in search of an egg. Having found one, each plunged quickly into the sea. Altogether it was a strange and exciting scene, even to the king, who had witnessed every race for many years. Some of the men broke their eggs and were obliged to return, while others could not find any, and were pecked at and buffeted by the enraged birds, which filled the air with their cries, as they swooped down to attack the intruders.

Kaitae reached the shore of Orongo well ahead of all except one man, who had won the race more than once in former years — a daring climber, a rapid and powerful swimmer. But Kaitae drew himself up on the rocks carefully, that the egg might not be broken, then sped away up the face of the cliff. For days he had studied the steep ascent, and a score of times had scaled its rough face, but never before with a large egg in his mouth. When halfway up he was breathing hard. His mouth became dry and parched, and the egg seemed to be choking him. But still he held on, climbing higher and higher, spurred on by the shouts of

his companions, who were now landing in large numbers.

One more effort, and he reached the top, and running forward, he held out the egg, unbroken, to the king. He was just in time, for his nearest

rival, breathless Tahana, came rushing up the narrow trail, followed, a few moments later, by a score of disappointed contestants.

As victor, Kaitae was the center of interest for the remainder of the day. Many gifts and favors fell to him, and he sat in the seat of honor, next to the king, at the dance and merrymakings on that and succeeding nights.

Kaitae was more intelligent than many of his comrades, and while he joined in their games and pastimes, he as much enjoyed listening to his elders when they related stories of the wonders of Waihu in the olden time. He learned that in those days the island was inhabited by many tribes of men, all under his ancestor, the king; and that the curious platforms and monuments, which have since made Easter Island famous over the entire world, were long before erected by his forefathers, just as in our parks statues are set up to commemorate our own distinguished men; and that the platforms were tombs, as much revered by the natives of the island as Westminster Abbey is revered by patriotic Englishmen.

During the boyhood of Kaitae, several strange ships bearing white men visited the island and traded with the islanders. But some difficulties occurred, and numbers of his people were killed; and once a horde of native enemies came in canoes, drove them to their hidden caves, destroyed their homes, and killed hundreds of the people. When Kaitae and his friends came out from their hiding places they found the statues, in many cases, thrown down and broken in pieces, and the tombs destroyed. The heads of the images weighed tons, and many could not be replaced; and there they

lie to this day, prone upon the side of the great volcano.

A descendant of King Kaitae, also bearing his name, is, or was a few years ago, still living at Easter Island — an old man over eighty years of age, who delighted in talking to foreigners of the wonders of his native Waihu in ancient days.

HOW SOME BIRDS ARE CARED FOR.

Among the birds we find most striking acts of affection, and, strange to say, most frequently among the very birds from which we would least expect such a demonstration. The uncanny night hawk,

Whip-poor-wills.

the boon companion of the bat, which appears at twilight and prolongs its revels far into the night, is an example. Rarely seen and little known, though

the night hawks are a large family and of wide distribution, this bird shows remarkable attachment for its young, and in protecting them exhibits more intelligence than many of our domestic birds.

The term "night hawk" is commonly applied to several species, all of which have certain peculiarities. From its curious cry, one is called chuck-will's-widow, this call being uttered so loudly by the bird that it has been heard for nearly a mile. About the middle of March the night hawks return from their winter pilgrimage; and, unlike most of the birds, they have no housekeeping to keep them busy, as they build no nests. While the robins, humming birds, thrushes, and others are busily scouring the country for material with which to build their nurseries, the chuck-will's-widow is fast asleep in some out-of-the-way corner, coming out only in the afternoon and evening to gather her supply of food.

When the time comes for laying, our seemingly lazy bird selects some secluded spot, and deposits her eggs anywhere on the ground; and the very first glimpse, if we are fortunate in finding them at all, explains why she builds no nest. The eggs are almost the exact color of the surroundings, and so mottled and tinted that only by the merest accident are they discovered; and when the two little chuck-will's-widows finally come out, they are even

more difficult to find than the eggs. Being very sleepy little fellows, they rarely move, and though standing within a few inches of them, the observer might suppose them to be two old brown leaves or a bunch of brown moss, so deceiving is their mimicry.

Though the eggs and young are so perfectly protected by nature, the parents are no less zealous in caring for them, and have been seen to go through remarkable performances in the defense of their home. When an intruder is first discovered, the mother bird throws herself upon the ground, ruffles up her feathers, and limps or flutters, always moving away from the apology for a nest; and when the credulous follower is safely out of the way, the wily mother, who has led him to think she can be easily caught, suddenly recovers from her lameness, and darts away to regain the nest from another direction. If, however, the nest be found and the eggs disturbed, the birds show the greatest distress. A naturalist, who had merely handled the eggs without removing them, and then concealed himself in a neighboring thicket, saw the parent birds come skimming over the grass, alighting by the eggs in apparent distress, and uttering curious cries, as if greatly frightened. Finally, after a consultation, each bird opened its

great mouth (generally used as an insect trap), took in an egg, and, to the amazement of the naturalist, disappeared, carrying the object of solicitude to a safer spot.

The same habit has been observed in the collared goatsuckers of the Cape of Good Hope, which, like our night hawk, have enormous mouths. They also form no nest, relying upon the difficulty of discovering their eggs, which are like the surroundings where they are deposited; and when the eggs are threatened by any great danger the parents take them in their mouths and fly away — certainly a convenient method of moving the household!

The well-known whip-poor-will, which is at once recognized by the cry from which it is named, appears at dusk, and at one time was an object of superstitious fear to the Indians. These birds also lay their eggs anywhere upon the ground, and have been observed to roll them along with their bills; but perhaps the most remarkable sight is to see the anxious parent seize her shapeless chick by the downy feathers of its back, as a cat seizes a kitten, and carry it away over grass and sedge to some more secluded spot.

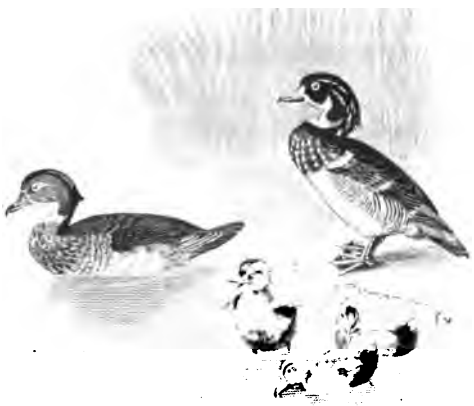
According to Azara, the naturalist, some curious beliefs are entertained in South America concern-

ing the ibijau, a night hawk. It is a large bird, but instead of laying its eggs on the ground, it deposits them in a hollow tree, and, according to the natives, fastens the eggs to the wood with a gum, which the old bird breaks off when the eggs are hatched, and so liberates the chick. But this gumming process is probably an accidental occurrence.

There is one of this tribe, and the largest,— the tawny-shouldered pogardus of Australia and New Guinea,— which takes the young birds in its mouth, but with a very different purpose from that of the whip-poor-will. Generally, these birds live upon insects, which they catch readily with their enormous mouths; but during the mating season the great, fluffy fellows become veritable cannibals, and attack the nests of other birds, taking out the young, and devouring them, perhaps under the impression that they have discovered a new kind of insect.

The demure duck, although a conscientious mother, and careful of her brood, has never been considered as especially solicitous for her offspring; but there is one of the family that performs a remarkable feat — remarkable, at least, for a duck. This is the summer duck,— *Aix sponsa*,— one of the most beautiful of its kind. The plu-

mage of these birds is exceedingly rich and gaudy, marked with streaks of white and black, the entire coat, in different lights, displaying various tints of bronze, blue, and green, while its head, the bill being red, is surmounted by a crest of glossy bronze-green feathers with violet tips, so that among the green leaves and branches it forms a striking and beautiful object.



Summer Ducks.

Unlike most of its tribe, the wood duck, as it is also called, builds its nest, often many feet from the ground, in hollow trees near streams. Here the oval eggs are laid, and covered with down taken from the mother's breast. After a while the young appear. For a while they are fed by the parents; and then comes the momentous question, asked, perhaps, by the little ducklings themselves: "How shall we get down?" Sometimes they are

a foot or more below the window of their house, which is twenty feet from the ground, and being very restless little fellows (as are all ducklings), there is a constant jumping and scrambling to obtain a glimpse of the outer world. The water is so near that they can hear the old folks diving and splashing about — a provoking situation, surely; but the serious question of moving has been considered by the old birds, for on the very day that the ducklings are large enough to be trusted, they are released in a very remarkable manner. The male duck takes his place as sentinel on some neighboring branch, uttering a low "peet-peet," while the mother flies to the nest, stretches in her neck, and as one of the ducklings jumps toward her, she seizes it gently with her bill, either by its soft, fuzzy neck or by one of its wings, and flies off, notwithstanding its objection to this strange treatment. She deposits it safely on the ground, at the foot of the tree. Up she goes, without pausing, and another bird is fished out of the nest in the same way, and then another, until in a very few moments the entire brood are running about on the ground, wagging their downy tails, and poking their little bills into every attractive spot. It is a proud moment for the parents. The male descends from his watchtower, and the pair waddle

away to the pond, followed by the entire family of ducklings, and all are soon enjoying the delights of free, rollicking life on the water. The nest is from this time deserted until the ensuing year, the young brood being led at night to some deep thicket in the woods.

The ruffed grouse often starts up at our feet and dashes away with a loud, whirring noise which is extremely startling to the novice. The nest is formed upon the ground, of grass and small sticks, generally at the foot of a bush or tree, under cover, and often skillfully made to resemble its surroundings.

Ruffed Grouse.

Sometimes a grouse loses all her brood but one; and on one such occasion the mother's actions were much like those related of the chuck-will's-widow. At the appearance of the gunner, she threw herself at his feet, as usual, and for a moment exercised all her arts and wiles; but the little one, not daring to leave her, rendered them useless. Seeing this, she hesi-

tated a moment; then, seizing the chick by its downy feathers with her bill, and rising, she flew away with it. She disappeared in a thicket, leaving the gunner wondering at her ingenuity. The hunter who noted this was Wilson, the famous American ornithologist, and he says: "It would have been impossible for me to kill this affectionate mother, who had exhibited such an example of presence of mind, reason, and sound judgment as must have convinced the most bigoted advocates of mere instinct."

In the far northern countries, innumerable birds find homes on high cliffs, utterly inaccessible from the sea. So numerous are they that, as their white or black feathers are turned seaward, they change the very appearance of the cliffs to light or dark. On these crags, at a dizzy height above the water, breed the guillemots, shapely birds with black back and head, and white breast. Standing on the rocks, they appear like pygmy men decked out in white waistcoats. Their eggs are often placed on the rocks,— there being little semblance of a nest,— and when the young bird appears it is confronted with a leap far more to be dreaded than that already described as being before the young ducks; but in this case also the old bird sometimes comes to the rescue, and bears it safely down to the welcome

water. This, however, is not done with the bill, the young guillemots being probably too heavy for such transportation; so the mother crouches down upon the rock, and, by threatening or coaxing, persuades the young bird to mount upon her back, between her wings, and boldly launches off, dropping gently down, perhaps several hundred feet, upon the water.

In the year 1867 six pairs of English skylarks were brought to this country and released on the meadows in Central Park. Hardly an English poet but has praised the song of the skylark. It is a glorious melody, and it would be difficult to find a bird better known or more widely appreciated; yet but few are aware of the intelligence it sometimes displays when rearing its young.

The nest is generally placed in the high grass of meadows; and a naturalist, in wandering through a field one spring, came by chance upon an entire family. Anxious to observe their movements, he withdrew a few paces, and there witnessed a curious proceeding. The old birds seemed greatly agitated, and were making a loud noise and darting about as if undecided what to do. Finally, the mother popped into the nest, seized one of the birds, and, lifting it upon her back, rose and flew away. Her mate almost immediately attempted the

same feat; but, whether because he was unused to the operation or not, the little bird would slip off. He finally succeeded, with much difficulty, in balancing his load, and flew after his mate. In a few moments both returned, and they repeated their former action until they had removed every bird from the discovered nest.

The same observer on another occasion saw a skylark, when startled from its nest, seize an egg in its claws and dart away. Possibly it had had some experience with nest robbers, and was determined to foil them this time, at least. An examination of the lark's foot, with its enormously long toe and fourth nail, will make it clear how this feat was easily performed.

Not long ago, a professor in one of the Western colleges observed an interesting exhibition of motherly affection in the woodcock. He was out walking, when the bird started up almost at his feet, and flew away over the bush. Aiming his gun, he was about to fire, when he noticed that she held something between her claws. Curious to see what it was, the observer followed in headlong pursuit through the bushes. As her flight was somewhat labored, he soon came near enough to distinguish a downy little woodcock — a mere bunch of fuzz with a long beak and beadlike eyes — resting

between the mother's claws; but then, with her precious load, the cunning mother suddenly darted into cover and disappeared.

Several other observers have witnessed similar occurrences, in this country and in England. Their testimony shows that these birds undoubtedly have much more intelligence than is usually accorded to them.

The remarkable devices of various bird mothers for protecting their homes and young are innumerable.

A Flycatcher's Nest.

Some of the cuckoos deposit their eggs in the nests of other birds, among the eggs already there, thus shirking maternal cares. Their offspring, thus abandoned, are well lodged, as no sooner are the young cuckoos hatched than the little interlopers throw out the other eggs, or even the young birds, and thus obtain the food rightfully belonging to the dispossessed brood.

The great-crested flycatcher, and several others, are said by writers to adopt an exceedingly novel method to frighten away other birds and lizards that would prey upon their eggs. They wind into their nests one or more of the old skins which have been shed by snakes, so that these appear to be live snakes coiled about the nests. I believe few nests of the great-crested flycatcher have ever been found without one of these sham snakes as a presumable protection against marauders.

JACK AND JILL REYNARD.

JACK and Jill Reynard, before I became acquainted with them, lived in a deep, dark valley in the Sierra Madre Mountains—a canyon that was a green river in its beauty of foliage, as it wound away for miles through the heart of the mighty range.

Jack and Jill were mountain folk, having their home in the thick growth of greasewood and manzanita that covered the slopes, perhaps lying on isolated rocks in sunny places during the day, and only occasionally venturing down into the lowland at night, when their human enemies were sound asleep.

If foxes talk, I have no doubt that Jack and Jill were cautioned about these lowland expeditions by

certain old and gray foxes, and warned that there was danger even at night. Be this as it may, Jack became the unfortunate possessor of the secret, brought, perhaps, on the wind itself, that in a certain ranch yard there were some dainty young chickens.

Jack, apparently, did not trust his secret to any one, not even to his companion Jill; and one night when it was very dark, and even the coyotes did not care to venture out, he strolled down the mountain, crept through the manzanita brush to a trail, and gayly trotted down into the valley.

Jack failed to appear the next morning, or the next thereafter, and Jill, in all probability, decided to look for him. At all events, on another night, when the moon was but a faint crescent against the sky, she stole quietly away, following the same trail over which Jack had passed a few nights before, until she saw a ranch house where lights were gleaming; then she stopped, raised her pointed nose high in air and sniffed, looked about her, and sniffed again. As she stepped around a tall yucca, she made out in the darkness a chicken roosting on a limb of greasewood. Here was a supper; and with a quick jump Jill seized the fowl. Then came a sharp, quick sound, and, uttering a cry of fear, poor Jill found herself caught in the jaws of a steel

trap that held her fast. Struggles, tears (if foxes weep), moans, and howls were of no avail, but Jill fought fitfully for freedom throughout the long night. In the morning the rancher appeared, smiling as if he knew where Jack had gone. He released poor terrified Jill, and, instead of killing her, handled her injured paw carefully — so gently, in fact, that she made no attempt to bite. Taking her under his arm, he strode down to the ranch, jumped into his carriage, and an hour later drove into an orange grove in Pasadena. Here the first thing Jill saw, when released from the bag in which she had been carried, was Master Jack sitting under an orange tree, with a fine collar about his neck, and looking as comfortable as you please, except that he was holding up one paw. So he, too, had fallen a victim to the trap!

Jill was soon provided with a collar and chain, and tied to the same tree; and so they met again.

Exactly what they said, I cannot pretend to tell; but what I think they said, as I watched them from my window, was this:

"Did you come down to find me, Jill?"

"Yes, and I was caught in a trap," was Jill's answer.

"So was I," Jack must have said, for he held up his paw and groaned dismally.

"Ah! if you had not made such a secret of it — if you had been generous and told me about the ranch, I could have gone with you, and we should not have been here," was what Jill had to say next. "You were going to eat that chicken alone, Jack. You know you were."

"Did you bite that man, coming down?" asked Jack, probably being quite willing to change the subject.

"No," Jill replied.

Though Jack had been very savage at first, Jack and Jill grew tamer each day, and never attempted to bite their mistress. They ate from her hand, and permitted her to stroke their glossy fur and brushes. Occasionally there was a little trouble. Mouse and Dinah, two pet greyhounds, grew jealous of the attention of their mistress. To stand by and see a fox — or, worse, two foxes — have a whole chop, and then be offered the bones, was too much to bear; so, as soon as their mistress was out of sight, Mouse and Dinah would draw near, and while one attracted the foxes' attention, the other would attempt to steal the chop. This went on for some time, and Jack had almost made up his mind to bite some one — in fact, he did give his mistress one little nip — before the reason was discovered.

Jack and Jill grew fatter every day, and I often saw them looking in the direction of the little stream with ears up, evidently listening for the sound of waters that came from their mountain home.

As a rule they were taken to the stable at night. Once, however, they were forgotten, and a coyote roamed up through the grove, and undoubtedly would have made a late supper; but here a curious trick of southern California foxes came into play and saved them. They both climbed the tree, and from the top branches looked down on Don Coyote, who could but stand upon his hind legs and give utterance to his weird, laughing bark. How Jack and Jill gained the top of the tree might be a mystery to people in the East, for foxes there, as a rule, do not climb trees; but this pair "shinned up" in a way well known to active boys. In fox-hunting here, I have known the sly Reynards to leap into a tree, climb, and reach from its branches the limbs of a tall sycamore, and, by following the masses of vines which interlace the arroyo, travel for some distance without touching the ground, to the confusion of the foxhounds, who sought in vain for the scent.

Jack and Jill soon regained their spirits, and when the lame paws were cured they were as

bright foxes as ever stole a chicken; and as they were so attractive, it was decided that they must have their pictures taken. So one day a very

Jack and Jill Reynard.

patient photographer succeeded in making a picture of them.

Now, whether they thought that the photograph might be used in identifying them in case of an escape, I do not know; but neither fox would look up when placed on the piazza railing, and it took three grown persons, besides boys and dogs, to keep their attention; then, just as the photographer was ready, Jack would look down again, and Jill would follow suit. Finally, the photographer imitated the cries of dogs, cats, and various animals, the boys shouted, I snapped the whip and threat-

ened them with the pack of foxhounds (only too willing to dine upon them), their mistress waved a white banner from the balcony above, until, amid a perfect pandemonium, Jack and Jill looked up, the camera clicked — and the picture was taken.

But one day Jack escaped. Whether frightened by the photographer, or overcome by homesickness, no one knows; but one morning he was gone, and the truth of history requires the statement that soon "Jill went tumbling after."

SOME CURIOUS FISHERMEN.

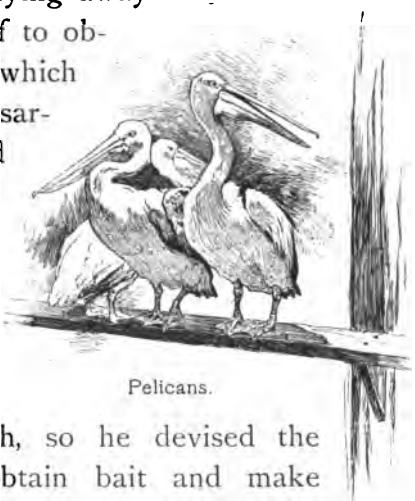
A NATURALIST was wandering along one of the many small lakes which form a characteristic feature of certain portions of England, when he saw a large goose fluttering toward him, creating a great disturbance on the smooth water. When he first observed the bird it was some distance from shore, but by the time he reached the water it came fluttering and hissing up the bank, continuing its flight over the grass, and, to the astonishment of the observer, dragging a pike, that danced about as if objecting decidedly to such an unceremonious landing. The gentleman was about to follow the pair, when a party of boys appeared, flushed from a hard run, and claimed the goose and fish, on the

ground that the goose was their property and had been fishing for them.

"We use her to catch pike," said the spokesman of the party, "and it's very easy when you know how. You see," he continued, "we first catch the goose,— and that's the hardest part,— and then we take a fish line about eight feet long, fasten a baited hook or a spoon to it, and tie it to the leg of the goose and let her go. She takes to the water, you see, and drags the line, and in a few moments, if it's the right time, you'll see her coming in, just as you did now. You see, the pike gets hooked, jerks her leg, and of course she starts for the shore, and drags the pike up on the green."

This curious and laughable method of catching fish is not confined to geese or to England, certain birds in various parts of the world being utilized in a similar way. Some years ago I had an acquaintance on the shores of the Gulf of Mexico, near Yucatan, who, not averse to having life made as easy as possible, bethought him that the pelican could be used to reduce the time expended in what he termed "labor." It so happened that he had several tame pelicans,— long-necked, huge-pouched, asthmatic-voiced fellows,— and one of these, named Jack, he selected to experiment with. He had nailed a piece of plank to his cabin, so that it ex-

tended out six or seven feet, and on this the tame pelicans roosted at night, and clapped their bills during the day, and every morning at about six they could be seen flying away to the adjoining reef to obtain their breakfast, which consisted of small sardines. It happened that these little fishes, also called "hardheads," were very choice bait, and much esteemed by my acquaintance, but difficult to catch, so he devised the following plan to obtain bait and make the pelicans earn their own living.



Pelicans.

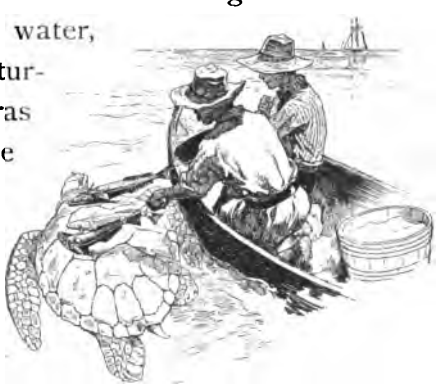
Overnight he fastened about the narrow neck of the pelican Jack a leather strap, and arose early the next morning to watch the success of his ruse. The birds started out as usual, and soon Jack dived into the water, and a moment later rose triumphant, with his pouch filled with struggling sardines. The bird tossed his head to swallow, but the strap prevented. Again and again the puzzled bird essayed to enjoy the results of his capture, but finally gave it up and flew ashore, and alighted on his roost,

still carrying the burden, which was now secured by the owner.

When the first Europeans went among the natives of the islands about Cuba, they found a remarkable method of turtle-catching in vogue. This consisted in using a fish known as the remora, or sucking fish, from a remarkable disk or sucking plate upon the head. Upon examination, it resembles somewhat the Venetian blind, consisting of a series of seeming slats. I have often seen the fish make use of its sucker on a shark, and its sole purpose seemed to be to enable the fish to rest. The remoras are social in their habits, and are always found following some larger fish. Usually they swim along, their dark forms presenting a striking contrast against the dun-colored shark; but if tired, or if the shark is hooked, they immediately reverse sides, and fasten their disk upon their great companion, and are thus towed along without the slightest exertion on their part.

When a native turtler went out fishing, he took, instead of the peg in use on the Florida reef, a pail of remoras, each of which had a leather ring about its tail. To this was fastened a long line about as stout as an ordinary cod line. The canoe or boat was slowly and carefully sculled along until a sleeping turtle was espied upon the bottom, upon which

the remoras, two or three, depending upon the size of the turtle, were dropped overboard. At first they would perhaps swim wildly about, at loss without some protector; but very soon they would discover the turtle, dart toward it, and fasten their plates to its shell. Perhaps this would not awaken it, as it is a very quiet operation; but a tug at the strings would surely arouse it, and with a rush it was at the surface, where it took a quick breath, then, catching a glimpse of the canoe, it was off like an arrow. The natives would now throw over the line, gradually putting a strain upon it, and in a very few moments the canoe would be rushing along through the water, towed by the great turtle, with the remoras as traces. The chase depended upon the size of the turtle, and sometimes lasted nearly an hour, the fishes never releasing their hold until their victim was hauled alongside and lifted in, when they were forcibly taken off and placed in a pail to await the appearance of another victim.



V.
Fishing with the Remora.

Curiously, in nature we find some fishermen whose methods show a remarkable similarity to human devices. An interesting example is seen in a common American fish, the angler. In appearance it is a hideous object, literally a great fleshy bag two or three feet in length, with an enormous mouth. It can flatten out to an astonishing degree, and when it goes fishing, if it does, according to popular belief, we can imagine it lying flat on the bottom, looking like a mossy rock, as in its color it is almost a perfect mimic of its surroundings. Not only this, but nearly the entire family are provided with a marvelous assortment of fleshy barbels, which hang from under the mouth and various parts of the body, in shape and color almost like the local seaweed; and as they wave to and fro, the deception is remarkable, and the fisherman is as completely disguised as occasion demands. But where, you will ask, is the rod and line? Surely fishes do not have such conveniences? The rod of the angler is the first spine of its dorsal fin, and the second and third can also be used in some cases. In one that I examined, the first rod was about eight or ten inches in length, slender and pliable, and of the exact color of the fish. The base or butt was fastened to a slender opal-hued bone, exactly as a staple is to the hook that holds it, of course

being hidden beneath the skin, flesh, and muscles. Some fishermen, particularly young folks, do away with hooks, especially when the bait is very good, and this is said to be the case with the angler. It has no hook, or even line. The so-called bait, a fleshy, shining, often highly colored bit of membrane, dangles at the very tip of the rod, and when the great fisherman is nicely hidden in the weeds, it is supposed to be gently lowered or bent forward, so that the bait hangs just in front of the cavernous mouth with its rows of movable teeth. Perhaps the bait dangles like a worm in the current, and soon some unsuspecting small fry spies it, darts ahead, and the bait moves away. The rod is gradually being lifted, and finally the victim is hovering just over the mouth. Then perhaps the green eyes of the Lophius twinkle with satisfaction, the rod is jerked back, a great cavern opens below the inquisitive fish, and into the capacious cavity it is drawn, and down comes the rod, ready for another bite. This is the popular belief regarding the use of the fin, or fishing rod, but it is only just to say that no naturalist has ever observed the act.

A number of other fishes have a somewhat similar arrangement by which they could secure prey, but the angler is perhaps the most remarkable.

THE GREYHOUND.

AS I write, a greyhound, faithful and true, is looking up into my face, her long, slender muzzle resting on my arm, her eyes beaming with intelligence. She is blinking, puffing out her lips, whining—in fact, laughing and talking, after her fashion; and probably this is what she is trying to say: "I am a greyhound. I can outrun any hare in California, and when I was younger and not so heavy I could jump up behind my master on the horse, when the grass and flowers were tall, and so look around for a jack rabbit."

Mouse does not mention that the horse decidedly objected to her sharp claws, sometimes bucking to throw her off, and thus has often made it very uncomfortable for her master. She has just taken her head from my arm, offended perhaps at this breach of confidence, so I must continue the story without further comment from her.

Mouse is but one of a number of greyhounds that I have owned. Some were mouse-colored, like Mouse herself; others a tawny hue; others again, mouse and white. And in the field together they presented a fine appearance — long, slender forms, delicate limbs, powerful muscles, ratlike tails, deep chests, pointed muzzles, and feet like springy cushions. They are quaintly described in the old lines:

"Headed like a snake,
Necked like a drake,
Backed like a beam,
Sided like a bream,
Tailed like a rat,
And footed like a cat."

When preparing for an outing, Mouse and Dinah (the latter being her baby, though taller than the mother) well know what is to come. When crop, gloves, saddle, and bridle appear, they become intensely excited, and insist upon holding my gloves or the crop, and, when I mount, leap up against the horse again and again with every expression of delight.

As we ride out of the orange grove, it is a mild and delicious morning. Hills, fields, and meadows are green; roses are on every side; oranges glisten on the dark-green trees; the air is rich with floral

odors and filled with the song of birds. Snow is gleaming on the big peaks of the mountains; it is winter there, over the tops of the orange trees, but summer down here in the valley. No wonder the dogs are delighted, and the horses need the curb! Ladies and gentlemen now appear, coming out of the side streets, and bound for the "meet," followed by coaches with merry riders, all headed for the mesa at the foot of the range.

Presently the silvery notes of a horn are borne melodiously on the wind, and out from the shadow of the eucalyptus grove comes the pack of hounds from San Marino, one of the beautiful homes in the San Gabriel. A few moments later the hunt is together on a lofty hill overlooking the surrounding country. Young folks are patting and admiring the dogs; and noble fellows these dogs are. Among them are some great, tawny, leonine creatures, brought from Australia, where they hunted the kangaroo; others are mouse-colored, and one is jet black. Each a bunch of springs and nerves, a noble group they make —Dinah, Silk, Raymon, Fleet, Eclipse, and many more.

The hunt is made up of ladies and gentlemen, lovers of riding and dogs. Thirty or more are on horseback, with invited guests from all over the

county, and the remainder in coaches and carriages, who follow the hunt in this way, and at noon meet the riders at breakfast in some shaded nook. The horn sounds gleefully. The great, high-pointed Mexican saddles, which the gentlemen use, are looked after. Horses champ their musical bits, eager to be off; and finally, at the word, the cavalcade winds slowly down the hill, spreading out over the mesa — a gently rising tract, the slope of the mountains, planted with grape, orange, and olive, with intervening spaces of very low brush. Two miles or less away rise the Sierra Madres, like a huge stone wall, with peaks from four thousand to eleven thousand feet high; and along their base the hunt proceeds. A few feet in advance, mounted on a fiery broncho, is the master of the hounds, with his silver horn. The dogs separate, and move slowly ahead, wading now through banks of golden poppies, wild heliotrope, and brown-backed violets. Greyhounds do not hunt by scent, as foxhounds do, but by sight alone; so every now and then they stop to look about, all the while keeping a keen eye ahead.

Suddenly there is a shout, and horses and dogs are away. From under the very nose of Mouse a curious apparition springs up — a fluffy object of grayish tints. It is the jack rabbit! — the enemy

of the farmer, the girdler of fruit trees. For an instant he stands astonished, wondering what it is all about, then dashes away like a rocket, and is followed by the field. Nearly all the dogs see him, while those which do not follow the others. The horses seem to understand the shout, and in a moment are off in a wild race over the mesa, beating down the flowers, and throwing clods of earth behind them.

The jack, true to his instincts, makes for the low brush in a washout. He seems a streak of light disappearing and reappearing here and there. The dogs are doing their best, working like machines. Watch their wonderful running! Even at the terrific pace, with ditches, and holes dug by gophers, badgers, or owls to look out for, the action of the beautiful dogs attracts our attention. They sweep on like the wind — a kaleidoscopic effect of grays and yellows, passing and repassing. Now Silk leads; then, in turn, the blue dog is ahead. See! Mouse is in the air. Losing sight of the game, she leaps bodily three feet upward over the brush, looks quickly around, catches sight of the fleeing form, and is away again. The speed is marvelous! No race horse can keep up with a thoroughbred racing greyhound; yet the field is doing bravely. One little boy, though far behind,

follows pluckily, his short-legged pony struggling sturdily through a plowed field.

The hare has dashed across the washout and up a large vineyard, around and down a well-known road. How they go! Four, six, ten horses all bunched, and running like the wind — a wild, melodious jangle of hoofs, spurs, and bit chains. Up go the dogs suddenly. "Jump!" cries the master of the hounds, warningly, turning in his saddle. The hare has stopped abruptly at the edge of a dry ditch, and turned at a sharp angle. Some of the dogs go over and sweep around in great curves, while others break off on both sides, and are soon following the game over the back track. A noble chase it is! Everything favors the hare, and he is making a great run. Hunters give out; one or two dogs are fagged; but over the green fields and down toward the city goes the main body of the hunt. The little fellow on the pony has become discouraged. The pony is breathing hard, and his brave rider's yellow locks have evidently been in contact with the pin clover.

But courage! What is this? A shout from below, and he sees the jack, with ears flat,— a signal of distress,— coming up the slope. The dogs have turned him again. Off the young rider goes over the field, side by side with hare and

hounds. Soon a big mouse-colored dog darts ahead, overtakes the hare, and kills him instantly. Often the dog inserts its long nose beneath the

"Often the dog tosses him into the air."

hare, and tosses him into the air. A moment later the entire field is about the catch, and the long ears and diminutive brush of this farmers' pest decorate the hat of the first lady in at the finish.

Panting dogs and horses and flushed riders are grouped about; owners making excuses for pet

dogs, and all agreeing that the hare was a most extraordinary old fellow, wily and conceited. He must have girdled many peach and cherry trees in his time, and no one mourns his fate.

The run is discussed, and its good points dilated upon; favorite horses are petted, and young men with suspicious grass stains on their coats and trousers are ridiculed by more fortunate riders. Now one may see a thirsty dog drinking from a canteen which one of the huntsmen has unslung, while other dogs await their turn; others again are lying on the cool grass, panting like steam engines, yet very proud of their work. Half an hour or more is given for rest; then dogs, horses, and riders are ready for another run, and perhaps two miles of delightful country is gone over before another hare is seen. This time he runs for the mountains, and, after carrying the hunt a mile or more up the slope, dashes into a canyon, and

is away, while the disappointed dogs and riders join the coaches and carriages at the hunt breakfast, spread on the slope among the wild flowers; and here, looking down on the lovely valley and the Pacific Ocean thirty miles away, the day's sport ends.

Such is real "hare and hounds" in southern California — an inspiring sport, as the natural instincts of the greyhounds are given full play, and the hare has every advantage, and can only be caught if faithfully followed by riding at a pace which, for speed and excitement, is rarely equaled. In certain regions of California the hare exists in myriads, and the ranchers keep the greyhounds to run them off; so it is natural that Californians should believe that they have some of the fastest dogs in the world. How fast can they run? A good greyhound has been known to run four miles in twelve minutes. Silk has caught a hare within one hundred and fifty feet of the start; and as for Mouse, now fat and heavy, I have run the fastest horse I could find against her, and she was always just ahead, looking back as if to say, "Why don't you come?"

Coursing is by no means a new sport. Not only is it an old English custom, but even in the ancient carvings of Thebes we find the greyhound.

Among the ancients, chasing the hare with these dogs was considered a noble sport; for the greyhound has an aristocratic mien, and is the type of refinement and culture among dogs. True coursing differs materially from the methods of the hunt described, and often degenerates into a sport carried on simply for gain. It was first organized as a sport by Thomas, Duke of Norfolk, in the time of Elizabeth, and the old rules are to some extent followed in England to-day. In these, the various efforts of the dogs in turning the hare count, and numbers of dogs contest, one with another, to a finish. In America, hunting clubs rarely run the dogs in inclosures, as it is unsportsmanlike not to give the hare every advantage in an open country.

The hare runs as fast as the dogs; but as he lacks their endurance, he takes them up slopes and over rough country, displaying great cunning. One old hare, which I chased a number of times, invariably ran in a wide circle, finally leading the dogs among the rocks, and escaping in a thick grove. This little animal was indebted to me for much exercise, and I have no doubt he enjoyed the running. The hare, being smaller and lighter, can turn more quickly, and the best dog is the one that can most adroitly meet these quick changes of direction. The pack is rushing along when the

hare suddenly turns at a right angle; poor dogs overrun and take a wide turn, and before they can recover, the hare is far away, while a good dog will lose but little. Once my dog had almost caught a hare, when the cunning animal darted to a tree and began to run around it in a circle, while I stopped and looked on. Mouse could not make the turns so quickly, and apparently soon became dizzy, for, as the hare ran off, she came to me, very much embarrassed at my laughter. Another time I saw a jack turn suddenly, dodge Mouse's snap at him, and dart between her legs and away.

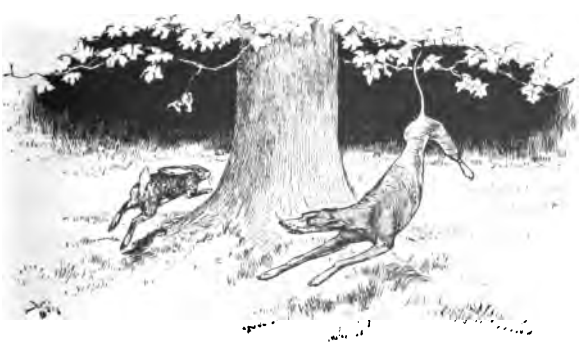
The famous dog Master M'Grath was for many years the fastest dog in the world; but in making comparisons, it should be remembered that the English hare is not so swift a runner as our Western jack rabbit, or hare.

The greyhound, running by sight alone, shows remarkable intelligence in following the game, leaping into the air, as we have seen, looking sharply about, and using its intelligence in a marvelous way. When a hare is caught, he is killed instantly and tossed into the air, the other dogs recognizing the winner's rights, and rarely making an attempt to touch the game after the death.

Besides being shapely and beautiful, the greyhound has both courage and affection. It will run

down a deer or wolf as quickly as a hare, and is ferocious in its anger with a large foe. My dogs are remarkably affectionate and intelligent, extremely sensitive to kindness or rebuke. The moment the house is open in the morning, Mouse, if not forbidden, rushes upstairs, pushes open my door, and greets me as if we had been separated for months. Then she will dart into my dressing-room, and reappear with a shoe, or a legging, if she can find it, and present it to me, wagging her tail, and saying plainly: "Come, it's time to be up; a fine day for a run!"

No charge of cruelty can be brought against coursing in the open country, where the animal is faithfully followed. In shooting rabbits and hares they will often escape badly wounded; but death by the hounds is instantaneous, and the farmer is relieved of a relentless pest.



MINGO'S FIFTH HAND.

My acquaintance with Mingo was purely accidental. I was standing, one day, by the house of a large Newfoundland dog that was evidently much taken up by a number of lusty puppies, when I noticed a slender, snakelike object gradually slip out of a neighboring doghouse, and insert its tip into the door of the first doghouse. The shaggy mother within blinked quite peacefully, and one of the puppies galloped clumsily toward the intruder, and immediately the object coiled around the leg of the puppy in a gentle, friendly manner, and began to pull him toward the door. The little dog protested, after the manner of his kind; but the visitor was persistent, and slowly the puppy was dragged out of his own house, across the foot of space between, and, after some little scuffling, disappeared in the other house. A moment later a kitten stopped before the doorway of the second doghouse, and out came the long, insinuating object again, and before the kitten could object, even had she been so disposed, one of her hind legs was encircled, and she, like the puppy, moved toward the doorway, dragged along tail first.

Ordinarily a cat would have been thrown into great excitement by such treatment, but not this one. She uttered a single plaintive "meow!" which, understanding something of the cat language, I considered more a sound of passive acquiescence than anything else. My eyes, soon again reverting to the opening, encountered a pair of great brown ones, pathetic and mournful to a degree, peering from beneath shaggy gray eyebrows.

For a moment the eyes looked at me; then, seeing that I was friendly, the head to which they belonged came out, and there rose before me the owner of the mysterious serpentine object — a monkey so tall and slender, so completely given over to arms and tail, that I could only compare it to a gigantic spider coming out of its den. It stood up, reaching one long, attenuated arm almost to my shoulder, and then I perceived that it held under the other the puppy, whose blue eyes blinked at me in amazement. Another step, and out came the kitten, the monkey's marvelous tail, which was like a fifth hand, still clasped firmly about her leg. Upon leaving his house, Mingo assumed a perfectly upright position, holding one hand over his head; and then, occasionally dropping to all fours, he crossed the little grassplot, and easily swung himself into a tree. His long tail stretched out to

its full length, and by it he actually lifted the kitten until, when four or more feet from the ground, she scrambled at the limb and aided herself up. Mingo finally settled himself comfortably on a bough with the puppy, which he held closely in his arms. This, I found, was an almost daily occurrence. Sometimes the heavy puppy would be lifted off the ground by the tail-like hand, and then dropped; but as a rule he was carefully tended.

Mingo belonged to a tribe known as Coaita, and came from the valley of the Amazon, so famous for its tree-top monkeys, and also for being the only country in which the ring-tailed monkey is found. Mingo's fifth hand, or tail, was so deft and cunning in all its movements that one wondered whether somewhere there was not an eye or two concealed in the coarse hairs to enable it to find its way about. It was always at the right place at the right time. It was tipped with what appeared

to be a finger, but was far more sensitive than any finger.

When Mingo climbed a tree, the fifth hand was invariably caught on a higher limb, so that when he lost his hold, as he sometimes did, with his hands and feet, he swung in safety by the tail. Very often, as he sat with his hands over his head, his face bowed, and his mournful eyes peering out with a far-away expression, the tail that had been wound about the limb would suddenly drop to the ground, and some passing animal would be seized and lifted aloft before it could realize what was happening. The tail was frequently employed to inspect crevices in its owner's house, and it could pick up small objects with the greatest ease. When approached, Mingo would often extend his tail and grasp one's finger with it in a most confiding manner.

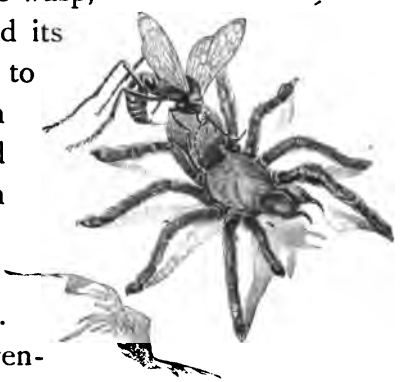
INSECT HYPNOTIZERS.

A HUGE wasp with a metallic-blue body was flying about, and the observers, with whom it was a familiar object, had said that it was a thorough hypnotizer; too thorough, indeed, as its victims, while they did not die at once, rarely recovered the full possession of their faculties. The insect

hypnotist was a giant among its kind — a powerful, showy creature that flew around in circles, now near the ground, then rising as though to take an observation, then settling down and walking about rapidly, its antennæ and wings vibrating with suppressed energy and emotion.

The wasp was evidently hunting for something, and suddenly pounced upon a brown object among the rocks. Investigation showed it to be a large and ugly spider, that faced the wasp, holding up its fore legs in a menacing attitude of defense. The wasp remained motionless for a moment, like a cat about to spring, only the vibrating antennæ telling of life; then it suddenly rose, and with a quick circle dashed at the spider from behind. The latter was too quick for it, whirling as though on a pivot, presenting its ugly fangs to the invader, that now stood upon a stone, apparently undecided. The spider, while a huge, hairy fellow with tremendous mandibles, was evidently cornered, recognizing an enemy not to be disregarded, and crouched low, keeping its head ever in the direction of its watchful foe. Suddenly the wasp darted away, making a circle of twenty or thirty feet — evidently a feint, as it quickly turned, and, like an arrow, shot back behind the spider, dropping down upon it like a tiger. The tarantula was taken unawares, but turned and

grappled its enemy with extraordinary fierceness. The two rolled over and over among the pebbles; then the legs of the spider relaxed, its struggles ceased, and the wasp, seizing it firmly, opened its wings and attempted to fly away. The burden proved too heavy, and was dropped; yet again and again the wasp dashed at the spider and endeavored to lift it.



I now interfered, and gently drove away the excited wasp, which alighted upon a stone near by, and watched the subsequent proceedings apparently with interest. The spider was completely hypnotized, if I may use the term to imply paralysis; while a few seconds before it was a picture of vigor, it was now, to all intents and purposes, dead. Having covered the insect with a leaf, I again retired, whereupon the wasp at once advanced, and, apparently puzzled, began a search for its victim. After a careful examination of every nook and cranny, the wasp found the spider, and again attempted to drag it away. Failing in this, the wasp stopped, made an excavation, buried its prey, and then flew away.

The spider was taken from its grave and an attempt made to restore it to life; its legs were manipulated, and cold water was thrown upon it; but the only response was a faint movement of the great hairy legs.

The wasp did not, it is true, employ the well-known and accepted methods of the hypnotist. It was not a mere waving of antennæ; but as the wasp pounced upon the terrified spider it pierced it with its long, slender sting, the subtle poison at once paralyzing it, producing a condition in which the victim would live a long time in what is known as a state of coma.

The insects which have this power of benumbing others are many, but the exact process by which they produce the singular condition is unknown. In some instances the object is to obtain food, but in the majority the insect desires to secure food for its future young; having paralyzed the body of its victim, the attacking insect introduces its eggs, which remain until the young appear, to devour the host.

The intuition of some of these insects is marvelous, as they are able in some mysterious manner to discover the exact location of a grub which is developing, snugly stowed away in the fruit or branch of a tree. There is no exterior evidence of the

presence of the concealed victim, but the insect discovers it readily, and with unerring aim sends its ovipositor down through the bark, penetrates the animal, and deposits in it one or more eggs. The unfortunate grub is perhaps benumbed and its faculties arrested, not being injured in any way, so that it is slowly consumed by the young as they issue from the eggs.

Certain ants may be said to hypnotize seeds. Thus seeds planted in the ground either decay from too much moisture, or sprout; yet certain ants, known as harvesters, are able so to treat certain seeds that their power of sprouting is arrested. They have received their name from the fact that they store away seeds in cells beneath the ground for future use. These seeds lie in damp chambers favorable to their growth and development, but the intelligent creatures which have placed them there have literally hypnotized them — in other words, have arrested all their functions of development, so that they lie dormant for an indefinite length of time, to be used as the ants desire.

It might seem that there is margin for mistake in this; but careful experiments have been made which show that if the ants are removed from such a nest, or prevented from reaching the seeds, the latter soon sprout, proving beyond question that

the intelligent creatures have some method of holding the seeds in check.

THE GAMES OF ANIMALS.

Locusts Playing Tag.

One warm, sultry afternoon, as I lay upon a great ledge of rock that boldly fronted the sea on the Maine coast, watching the white sails creeping by, I heard a curious sound in my immediate vicinity, and soon became the silent witness of what is certainly one of the most interesting phases of animal life, namely, their games, about which but little has been written, and, from the nature of the case, very little is known. To become familiar with the sports and methods of amusement of animals, we must come upon them accidentally or by stealth. I have no doubt that upon the afternoon in question, from the liberties they took with me, my strange playfellows thought me fast asleep, or fancied that I was an old figurehead washed ashore.

A sharp clicking, as if several telegraph operators were holding a conversation, first attracted my attention. Now a series of taps would come from

about my head, soon answered by others at my feet. Finally the tappers seemed to meet, and their clicks became so loud and confusing that I turned my eyes, and saw four or five locusts, standing with heads together, evidently holding a deep consultation. They were the great rusty-dusty fellows that always frequent the rocks and there openly defy the birds, relying for safety upon their resemblance in color to their surroundings.

For over a minute the clicking, or talking, was kept up; then the party was reënforced by several others, and in a few moments they evidently chose partners, and commenced a veritable game of tag. Very honorable, too, were they about it, separating a foot or more before the chase actually began; and then their movements showed them adepts in the art of strategy.

Every pebble, stone, or leaf was used to cover their advance, and every possible attempt made to deceive, until finally, when the follower was near enough, it darted at its playfellow with a rush, seemed to touch it quickly, and then, with a loud, victorious chatter, took to its wings and flew several rods away, only to return stealthily soon afterward.

Finally the game was changed. Two locusts placed themselves opposite each other; then one

would leap over the other, and before it had landed, the second was also in the air, or passing over it; then both would jump simultaneously, and pass each other with a loud click, exactly as do the men in the circus.

Next they began running around in a circle, forming in regular rows and shapes, marching and countermarching. Finally, a very solemn old fellow clambered up on my shoe and began a violent clicking, upon which the evolutions ceased,—I suppose, to listen to his harangue,—when a friend innocently broke in upon the scene and put the playmates to flight. It may be doubted by some if these movements were games, as we understand them; but as the rocks were bare, and there was no food to search for, there is but one construction to put upon their actions — that they were undertaken for recreation, in which animals indulge, from man to the smallest creature.

Fishes have a decided sense of humor, judging from certain exhibitions that have been observed; the young, especially, have numerous games or methods of amusement; and their mischievous natures can best be appreciated when a large school is under observation. Through the flooring of a wharf, in tropical waters, I have often watched the varied throngs unsuspected and unseen. Such

games and sports as they indulge in! Now twenty or more join in chase of a single fish, darting in and out among the gleaming mass; and when the fugitive is caught, he is playfully taken by fins and tail, and held or dragged about. Now a floating straw is discovered on the surface, and over it with a daring leap the leader goes, followed by the rest, until the leapers in a continuous glistening stream dart into the air.

While we watch, a mischievous fish seizes the straw, and, drawing it beneath the surface, rushes away, pursued by a score or more, who grasp it, and a veritable tug of war is at its height, when like a flash the argus-eyed throng has disappeared. A grim barracuda, with a single struggling victim in his fierce jaws, explains the sudden flight.

The game of leaping over various objects I have noticed in many fishes, especially in the young garfish; and in an aquarium built out into the water I have frequently seen them leaping over a hawk-bill turtle that floated on the surface. This game at the expense of the turtle was kept up for some time, until a garfish in leaping landed fairly on the sleeper's back, when the astonished and indignant turtle took a long breath, and dashed away, scattering the assembled fishes far and wide.

Even the larger marine animals are known to

join in games and pastimes. The breaching of large whales is done at times in sport, and the movements of a school of these monsters are often so curious that the assumption is that some singular whale game is being enacted. Seals have been seen sliding up and down cakes of ice, and rolling over one another, taking headers — in fact, having all the enjoyment of a party of boys engaged in a similar amusement.

In its variety of games the American otter is not surpassed by any animal. In former times the otter was common in the Eastern and Northeastern States; but the advance of civilization has gradually driven it to the North and West, where it now ranks in value with the beaver. Otters are extremely shy and cautious animals. They build their homes on the banks of streams, like the curious duckbill of New Zealand, with one opening leading into the water, and another small one on land for air and ventilation; but when alone or unsuspicious of danger, the otter often indulges in games and sports by the hour at a time. Of these curious gambols, their game of sliding is a fair illustration.

In the winter a snow bank is selected near a frozen stream, and gradually patted down and rendered slippery. On this hill the otters congregate, and slide or roll down, singly or in pairs. In sum-

mer the preparation of the slide involves greater labor. A hill leading into the water is again selected, the grass and reeds are torn up and carried to one side, and the declivity is gradually formed into a muddy slide. Then the sport begins. Old and young participate in it, and roll into the water with great splashes—some on their backs, with feet in the air, others in a more natural position, some sidewise, and all scrambling up to try again, in every way showing their hearty appreciation of the time-honored game of sliding downhill. Audubon was the first to discover them at their games, and while he was concealed in the bushes he observed the construction of twenty-two distinct slides.

Otters' Toboggan Slide.

One of the most interesting performances among animals was recently observed among humming birds by a naturalist in Peru. The bird was first seen about a beautiful red flower in the basin of the Utcubamba River.

By concealing himself in the grass, the naturalist witnessed some of their games and sports. In appearance the bird is a veritable bit of sunlight. Its

crest is of rich sapphire blue, changing in various lights to vivid violet, while the breast is golden green, and the lower portions white; and darting about, the little creature gleams and glistens like a rare gem. It is not its colors, however, that are the most striking, but the arrangement of its plumes and feathers.

Our watcher found that the young birds had certain places in the air as playgrounds, where they met and performed strange feats, during which they presented a most remarkable appearance. The long tail feathers were now stretched out on each side from the body, and as the birds stood vertically in the air, they appeared to be resting on a roost. The game was played by either two or eight, the party forming in sides facing each other, standing perfectly erect in the air by the rapid vibration of their wings, the outstretched tail plumes also vibrating, and producing a curious sound, accompanied by a sharp clicking of their bills.

The only change in this dance was rising and falling, and advancing to and fro, but never changing the vertical position. At another time the observer saw two of them hovering in the same way on each side of a limb, apparently suspended; but like a flash they would change places, then dart back again, presenting an astonishing sight, espe-

cially in the case of a number, appearing like animated crosses suspended in the air, rising and falling, and moving to and fro, as though on some gentle breeze.

From the constant recurrence of these performances in the same locality in the air, the observer thought there could be no doubt that the birds were engaged in some game or sport, and that this was their playground.

HOW THE WHALE LOOKED PLEASANT.

WHETHER a certain whale that breakfasted, dined, and supped every day in the Santa Catalina channel, California, went out one morning with the determination of being photographed, I really cannot say; but the picture was certainly taken, and a careful copy of it made.

Living in the neighborhood, the whale was probably familiar with the steamer that plowed daily through its dining room; and if it was at all an observing whale, it must have noticed, on the morning in question, an unusual commotion on the deck of the steamer, and this is what it saw. The passengers were crowding about the rail, and on the upper deck stood a man and a little girl, the former holding a square black box, into which he looked

earnestly. And if the whale had come a little nearer, this is what it might have heard:

"Will he look pleasant?" asked the little girl of her companion.

"I hope so," he replied, glancing rapidly from the camera to the whale, that was then swimming a few hundred feet away.

The passengers had first observed it a mile or more distant, when the little girl said it was "dancing on its tail." It had, really, leaped out of the water, and for a few seconds exposed almost its entire form, — a most astonishing spectacle, — and then had fallen back into the sea with a thundering crash. Soon it came to the surface again, and, shooting a cloud of vapor into the air, slowly swam away, at intervals disappearing and reappearing, until finally it came alongside the steamer, swimming along within a short distance. It was then that the fortunate possessor of the camera secured a good position near the rail, and waited, as his little companion had said, for the whale to "look pleasant." Looking pleasant, in this instance, meant for the whale to show a large portion of its body above the water. It was now swimming just below the surface, its huge black form, sixty or seventy feet in length, distinctly visible, propelled by the undulating movement of the tail. Suddenly it rose, show-

ing just the portion around the blowholes, and with a loud puff the hot breath burst into the air, was condensed, and in a little cloud drifted away.

"Didn't he look pleasant?" asked the little girl, earnestly.

"Not quite pleasant enough," said the photographer, as he peered into the tiny window of the camera, that reflected the sea in brilliant tints. "I could catch the spout, but I want to wait until he throws his entire head out of the water and looks really pleasant before I touch the button."

It was an exciting moment, as never, so far as known, had a living whale, in the open ocean, posed before a camera, or a photographer seen so huge an animal obligingly swim along, allowing its picture to be taken.

"It's a tame whale, isn't it?" said the little girl, as the whale gradually came nearer.

"He certainly does not seem very timid," replied her companion; and as he spoke, puff! came the spouting, like the escape of steam, the vapor actually drifting aboard the steamer into the faces of the passengers.

The whale was now so near that the barnacles upon its back could be seen, and one man was sure that he saw its eye. Suddenly it sank, and all that could be seen in the little window was the dancing

waves and the white sails of myriads of velellas that covered the surface, scudding along before the fresh trade wind. Then, without warning, the crea-

"The creature suddenly rose again."

ture as suddenly rose again, showing a large area of its back, sending at the same time a cloud of misty vapor into the air as its top, or dorsal, fin appeared. The photographer saw it in the little window, and evidently thinking that the whale looked as pleasant as it, in all probability, would, touched the button, and took the first photograph of a living whale in the open ocean—the one shown above.

The Santa Catalina channel is famous for its whales, and they are frequently seen from the steamer that plies between the mainland and the island of Santa Catalina. While I write, there lies on the beach a huge specimen that was killed by a swordfish.

Some terrible contests have been observed between the great whales and these ocean swordsmen. Such a contest occurred opposite the little harbor of Avalon, Santa Catalina, and was watched by a small boatload of spectators who drifted near. A swordfish and a killer — or small-toothed whale — attacked the larger whale from below, and in its rage the latter appeared almost to stand upon its head, striking the water fearful blows from side to side with its tail. The battle was continued for several minutes, the whale being nearly helpless before its agile enemies.

On one occasion a whale rose so high above the water in a sudden, mighty leap, and so near my boat, that a photograph could have been taken. As the huge mass loomed up I thought it was a rock, and turned to the boatman, to ask an explanation; but as it fell with a crash, I saw that it was a whale that had thrown itself almost entirely out of the water. According to Captain Basil Hall, a whale has been known to leap over a boat.

TIDDLYWINKS.

NOT far from the old Mission of San Gabriel,—so near, in fact, that the sweet notes of the angelus could be heard,—stood an olive tree which tradition said had been planted by the *padres* under Father Junipero, nearly a century before. Now the old tree, still beautiful, its leaves green and silvery, formed a portion of a modern southern California garden, and, being partly concealed by a clump of bananas and the orange grove, was a favorite resort for birds of many kinds that made the land of continual summer their home.

Among them were two humming birds — beautiful feathered bits of animation — that had selected the old tree as a permanent home, and were now engaged in collecting material for the nest. Long journeys were made, and material of every available kind, such as horsehair, bits of wool, shreds of cotton, and the delicate down of the thistle, was used

in the construction of the nest, that gradually assumed an oblong shape. The interior was lined with soft, fluffy feathers and thistledown; but it was the exterior that displayed the skill of the little builders. The nest was placed in a crotch of the tree, so that from below it was almost invisible. The birds evidently intended it to look like a part of the tree; so they collected minute bits of moss from various trees, and attached them to the outside of the nest until it was entirely covered, and looked sufficiently like the bark of the tree to deceive any mischievous enemy.

A little later the smallest of eggs might have been seen in the nest, and finally the little ones appeared — curious-looking creatures, that opened enormous mouths at the slightest noise, and kept the parents busy providing food.

The humming bird family progressed finely until one day when one of the little birds, in the absence of its parents, determined to look over the edge of the nest and see something of the outside world. Scrambling up, it perched on the edge; then, in astonishment, perhaps, at the wonders it beheld, it lost its balance and fell, vainly fluttering, to the ground. It was nearly night, so the little bird lay there until early the next morning, when it was discovered by the gardener, lying almost in a pool of

water. Placing it in his handkerchief, the man carried it into the house; and here the history of Tiddlywinks begins.

Tiddlywinks was immediately adopted by the young lady of the house, who made him a soft nest in her button basket, and fed him with sweetened water, which he took readily from the end of a broom splint. Indeed, from that moment the little bird, hardly larger than a thimble, seemed to recognize her as his protector, and lost all fear. He soon learned to fly, and, as he gained strength in his wings, he gradually flitted from room to room, and from person to person, without the slightest fear. Sometimes he would disappear among the plants of the beautiful home; but when his mistress would call, "Come, Tiddly," the little atom would come hurrying through the air, to alight on her head or shoulder, though he preferred her finger. He always expected something, and begged in this way for a fly or some sweetened water, turning his head quickly from side to side, his bright little eyes seeming to tell what he wished to say. Taking him on her finger, his mistress would walk around the room, holding him up to the window, where he would catch all the minute flies and insects on the panes, darting at them with the rapidity of lightning. A small vial was kept filled with sweetened

water, and, when called, Tiddlywinks would poise in the air as he would at a flower and drink while his mistress held the bottle.

His domestication was perfect. When the family went to meals, Tiddlywinks often accompanied them, taking his position on the edge of the sugar bowl, and there waiting patiently, or otherwise, as the case might be, for his sugar, which was sometimes placed for him in a spoon across the top of the bowl, and of which he partook with evident satisfaction.

"Tiddlywinks would drink while his mistress held the bottle."

At night he flew to a great banana leaf that hung as a decoration across the top of an alcove in the studio, roosting on the coiled portion of the tip end. He never slept with his head under his wing, like other birds, but simply collected himself into as small a space as possible. In the morning he displayed his satisfaction at seeing his mistress again, and invariably bade her good morning by twittering short but musical notes.

There are few pets, especially birds, which do

not sometimes evince a desire for freedom; yet this atom was perfectly contented with his home, and never showed the least inclination to escape. One day one of the household went out into the garden, and hearing a piping sound, he saw that Tiddlywinks was resting upon his shoulder. The tiny creature had probably alighted there as he passed out of the house; but instead of flying away and taking his liberty, as might have been expected, he remained perfectly quiet while the gentleman walked back into the house. Tiddlywinks lived for some time, and became widely known for his remarkable intelligence; but, like many pets, he finally succumbed to an accident.

Several cases are on record of attempts to tame humming birds, but when placed in a cage they do not thrive, and soon die. The orange groves of southern California abound in these attractive creatures, and several may often be seen about the flowering bushes, seeking food or chasing each other in play. Once, when living on the slopes of the Sierra Madre Mountains, where the humming birds were very plentiful, I accomplished the feat of taking an adult humming bird in my hand. I first noticed it in the garden, resting on a mustard stalk, and wishing to see how near I could approach, I gradually moved toward it, by pretending

to be otherwise engaged, until I was within five feet of it. The bird looked at me calmly, and I moved slowly nearer, whistling gently to attract its attention, as I began to think something was the matter with it. It bent its head upon one side, eyed me sharply, then flew to another stalk a few feet away, contemplating me as before. Again I approached, taking care not to alarm it, and this time I was almost within reaching distance before it flew away.

The bird seemed to have a growing confidence in me, and I became more and more deliberate in my movements, until I finally stood beside it, the little creature gazing at me with its head tipped upon one side, as if questioning what I was about I then withdrew and approached again, repeating this several times before I stretched out my hand to take it, at which it flew to another bush. But the next time it allowed me to grasp it, and I had caught a wild bird in my hand, without even using salt.

In a succeeding year a pair of humming birds occupied an orange tree near my garden. The nest was not five feet from the ground, within easy reach, but very difficult to see. When I first discovered it, and successfully photographed the mother bird sitting upon her nest, with a back-

ground of golden oranges, the young birds had appeared — marvelous little creatures which looked more like some grotesque creation of the imagination than birds.

I watched the fuzzy atoms day by day, and soon began to share the labor of the parent, in feeding them with drops of sweetened water, which they readily took. In a short time they began to exercise their wings, and one morning, anticipating their flight, I severed the limb on which the nest rested, and removed the young birds to my study. The following day they left the nest, and I found them perched upon its sides, making short and erratic flights into the air. Then began the most interesting period of their existence — at least, to me. The birds were absolutely without fear. They at first vociferously demanded their sugar and water many times a day, but when fully fledged flew about the room, alighting upon my head or finger, exacting constant attention. They would come when called, and would find their way downstairs, frequently going to the dining room and resting on any convenient perch, or among the flowers on the table.

The perfect confidence which these little creatures displayed was remarkable. At night they perched on the edge of a small basket in a closet, and in the

early morning they would fly to my bed, poise over it and fan my face with their wonderful wings, and awaken me with the loud buzzing. Then would begin a vociferous demand for breakfast, and they would not be refused or put aside. Usually they ate in the air, as from a flower, poising and licking the sweetened water with the long, delicate tongue. To strangers the pets extended the same friendly attentions, and more than one visitor to the house was amazed at the beelike creatures flying about the rooms, and alighting here and there to rest a moment, displaying the greatest confidence and absolute lack of fear.

While the humming birds are the most delicate of the bird creation, — veritable feathered atoms, — their powers of flight are remarkable. Individuals of the ruby-throated variety have been seen to approach the steamers ten miles out at sea, during the flight from the mainland to Santa Catalina, a distance of twenty miles. Others, during the migrations, fly from the lowlands of Mexico to the arctic circle and back during the year, thus equaling many of the most powerful birds in endurance or the faculty of covering long distances.

One of the curious features of humming birds is that they are never found in Europe, being exclusively American, ranging from the extreme north

and south to the tropics, adding to the beauty of field and grove, being veritable living gems. Nothing can approach the humming bird in its gorgeous decoration. It is especially rich in the metallic tints, seemingly splashed with red, blue, green, and other bronzes. Some appear to be decked in a coat of mail, others blazing in the sunlight with headdresses and breastplates, dazzling to behold. The smallest of birds, they are one of the most beautiful of the many ornaments of our fields and gardens.

THE FAMOUS TORTUGAS BULLFIGHT.

THERE was an air of mystery about a certain house on the Dry Tortugas. For several days a number of boys had been coming and going, meeting in the back yard, and arranging seats about the sides (some of which they decorated with green

vines and others with pots of flowers), until the place bore the appearance of a circus, with its central inclosed arena.

The secret finally made its escape, and a rumor announced to the world that on the Fourth of July there would be in the arena a bullfight, at which a celebrated matador would appear.

I remember it well, for I was the matador, and the picadors and banderilleros were my fun-loving companions. Some neighbors had recently been on a visit to Havana, where they had attended a bullfight, and the event was now to be duly reproduced with all the splendor available.

I had been chosen matador. There was no little competition, and well there might be. The matador receives all the honors. He it is who, with eagle eye, stands like a statue and receives the terrific charge of the bull, slays him by a thrust of his gleaming sword, and then, as the animal is dragged off, accepts the homage of the people.

I was matador, not that I had any experience, but simply because I owned the "bull" — a very extraordinary rabbit that had known me as master for several years.

Jack, as the rabbit was called, differed from any of his kind that I have ever seen or heard of. He was not only absolutely without fear, but he

never missed an opportunity to show his courage. He stood not upon the order of going, but promptly charged every person or dog that dared to enter his yard. This disposition upon Jack's part, I must confess, was encouraged rather than otherwise. It was a strong temptation to scale the fence of the inclosure in which he was kept, jump in, run across, and climb up the other side just ahead of Jack, who would leap a foot into the air in his disappointment.

It can readily be seen, then, that Jack possessed all the characteristics necessary to enable him to enact the part of a first-class Spanish bull; and in no sense did he disappoint the great expectations we had of him.

On the day of the proposed bullfight everything was in readiness. The yard, which was covered with wire grass, was about thirty feet wide by sixty in length, and surrounded by a fence. Boxes had been placed in the upper end, against this fence; and here the young spectators were seated, representing the Spanish grandees and noble ladies, patrons of the sport.

As the matador, I was not to come in until the bull had been driven to a frenzy by the banderilleros, or dart throwers, and picadors, or spearmen. At an early moment I took my place among the grandees. I was dressed in an attempt at Spanish

magnificence, with numerous ribbons and a turban-like hat, and was armed with a wooden sword, as, after all, it was in fun, and at the last Jack was to be spared. The picadors and banderilleros were also fantastically arrayed. One was barelegged and had red ribbons bound about his sun-browned limbs; another wore a yellow sash about his waist and many-hued ribbons on shoulders and elbows. The two picadors were supposed to be on horseback, and were armed with long spears made of bamboo fishing poles; while the banderilleros only carried red bandannas, which they were to wave in front of the enraged bull to distract his attention if it so happened that the picadors were in danger.

Finally everything was ready. A blast from a bugle, and the slat which took the place of a gate was pulled up, the bull darted from his box, and with two or three hops gained the center of the arena.

Jack was a magnificent fellow, large, and dark gray, except a white stripe running down his nose; his ears were long, and lopped heavily. He was a native of the British Isles, and possessed a very pugnacious disposition. For a moment the bull (meaning Jack, of course) looked about, amazed at the unusual concourse. Then, perceiving a banderillero waving a red cloth, he started. His long ears

stood out straight behind, and he went over the ground like a flash. The banderillero stepped nimbly to one side, after the usual fashion; but Jack jumped for the scarlet cloth, seized it with his teeth, and jerked it from the hands of the banderillero, amid a roar of applause.

"The bull darted from his box."

This was an unexpected move, and not down on the bills, and the banderillero stood irresolute a moment. Not so the bull. Dropping the bandanna, he rushed at his enemy, who, panic-stricken, leaped into the air to avoid him, and then dashed pell-mell for the fence. The bull had gone by but a few feet, and, turning quickly, he flew in pursuit, with fire in his eye, and would have overtaken his victim had not a picador dropped the point of his long lance, and prepared to charge. Quick as a flash, the bull lowered his head and dashed under the weapon. Taken by surprise, the picador hesitated; the audi-

ence, seeing his danger, shouted encouragingly, then hooted and jeered as he turned and fled at full speed. The bull was not a foot behind, and the picador had no opportunity to climb the fence without being caught, unless he could first increase the distance between them. So on he flew, once around, then dodged, and, amid a roar of applause, leaped his imaginary horse into the air, allowing the bull to pass under him. Before the latter could recover, he was halfway to the fence. To increase his speed he threw down the spear. A few steps more, and he reached the barrier; his hands were on the top rail — up — almost over, when a long-eared object shot into the air. A yell, a ripping, tearing sound, and the bull dropped back with a mouthful of gaudy ribbons, while the defeated picador whisked over the fence.

Master of the Arena.

The bull looked at the ground, chewed the ribbons a moment or two, and boldly hopped into the

middle of the arena. He sniffed at the wooden lance, nosing it with contempt, then deliberately sat up on his haunches and looked around, with his great lop ears gracefully drooping.

This was undoubtedly a challenge; and the grandees stood up in the private boxes and cheered long and loud. In the meanwhile the "physician" in attendance had been sent for court-plaster, as on the brown legs of the picador various red streaks were rapidly appearing. After the bull had seized the gay ribbons that had ornamented the short trousers of the brave picador, he had used his hind legs vigorously as scratchers — "raking the picador fore and aft," as was said by a young sailor who was among the spectators. This was the first casualty, and inspired every one with no little respect for the bull, who was now lying stretched at full length upon the grass, with one eye on the boxes, where a loud talking was kept up.

The picadors and banderilleros decided that they had done their duty, which was to enrage the bull by feats of daring at the risk of their legs. The horse of one picador had been terribly gored, they said, a banderillero wounded, and his expensive costume ruined; and the bull was not only not conquered, but seemed to be enjoying it — to prove which they pointed to his recumbent form. Shouts

now came from the grand stand, and the grandees rose *en masse* and clamored for the matador.

For the benefit of the reader who may never have engaged in a bullfight, I should explain that the matador is selected for personal prowess and skill. He must stand the charge of the bull, and, as the infuriated animal dashes at him, step swiftly aside, and plunge his true and gleaming blade into the victim, killing him on the spot. It was now my turn; and as I stepped down from the boxes, and the grandees cheered and waved their sombreros, it was the proudest day of my life. My lath sword was looked to, and, feeling glad that I knew the bull, I stepped into the arena.

Old Jack first raised one ear as I entered, next raised his head and calmly eyed me; then he dropped his big ears upon the grass again, and pretended to go to sleep!

This was unbearable, and an agile picador sprang forward and fluttered a red bandanna before him. Jack rose into the air with a single bound, and away went the two for the fence, the picador escaping, and the bull leaping halfway, but falling back upon his haunches. For a moment he stood looking up, hoping that his enemy would reappear. Then, turning, he saw the matador.

Jack evidently recognized me, and felt that here

was no common enemy, but one who knew his tactics. And I did — numerous scars upon my legs testifying to the fact. He did not approach me, but loped slowly around the circle — a scheme to gain time, I thought. A picador now jumped after him; another met him in front. Finally he turned, and, as they fled, came at me upon a dead run. It was in the nature of a surprise; but I stood firm, intending to lunge at him, pretending to slay him; then, by successful dodging, I would avoid a personal conflict, claiming a victory upon the ground of skill. All eyes were upon me, the grandees were spellbound, and a blast from the tin trumpet rent the air.

On came the bull, and raising my gleaming lath, I prepared to strike and jump. But the bull forestalled me. Instead of coming close, as was his rule, he jumped at me from a distance of nearly three feet. Confused by the flying object, I fell back, caught my foot in a loop of wire grass, and ignominiously went down, with Jack upon me. He seized my thin trousers with his teeth, and with quick scratches of his sharp hind claws gave the article as many serious wounds. A shout — yes, a roar — arose as I fell! I was aware of the derisive tones, and in desperation I seized Jack by one of his long ears, wrenched him from his hold, and picked

myself up. No gayly caparisoned horses came in to drag out the dead bull; no applause arose from the grandees; no flowers or wreaths were thrown to the victor.

The matador had been fairly defeated, and he was forced to acknowledge it.

This unlooked-for ending had somewhat changed the programme. It was expected that the bull would

"I seized Jack by one of his long ears."

be slain or defeated; and a goat harnessed to a diminutive cart, with a garland of flowers about his neck, was in waiting to drag out the body. A compromise was finally effected, for the grandees cheered the bull and demanded that he receive the flowers.

So the matador accepted the situation; the goat was driven in, a box placed on the cart, and the victorious bull was perched upon it. He looked ready for another fight, and as if he would enjoy it.

The cavalcade drove up to the boxes of the grandees, and the wreath intended for the matador was placed about the neck of triumphant Jack. Chewing at the flowers, he was borne proudly around the arena, amid shouts, and blasts from the trumpet! Then the picadors and banderilleros opened the gates, and he passed out.

So ended the famous Tortugas bullfight.

ROGUE ELEPHANTS.

SOME years ago, a famous hunter, traveling through India in search of amusement and information, was met by a deputation of natives from a small village, who asked his protection from an elephant that had taken up its residence near their town. Not only had the great animal again and again destroyed their crops, but it had killed several men. Altogether, the elephant was the terror of the large and formerly prosperous community.

The hunter assured the natives that he would try to destroy their enemy, and he at once made his preparations.

The stranger was an experienced elephant hunter, having followed the great beasts wherever found, in Africa, Ceylon, and India. He knew at once that this troublesome fellow was what is known as a "rogue," — a term given to elephants that are vicious, not simply roguish,— brutes that try to destroy everything, especially the property and lives of men.

First, he must learn, if possible, the ways and habits of this especial rogue, and, with that object in view, he consulted the headmen and hunters of several villages.

One man said that the rogue was possessed of an evil spirit; that on one day it would visit one locality, and on the next day be heard of many miles away. As to its actions, the man said, it suddenly came from a dense jungle near his native town, and dashed through the streets at midday, tearing houses to pieces, throwing them into the air, and utterly wrecking the neighborhood. It also killed several people, after which it was seen quietly feeding in the gardens near the town.

Another native told a similar story. This time the rogue appeared at night, broke down fences, and destroyed the crops. When fired upon, it rushed into a small village, doing much damage, and driving the inhabitants to the woods.

Still another man reported that for weeks a public road between two villages had been deserted by every one, because the rogue had taken possession. The man added that at the time of the hunter's coming the elephant was destroying the rice fields about the town, the people being powerless to prevent him.

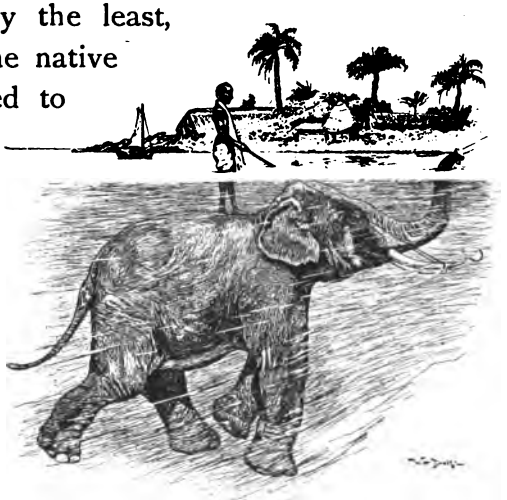
This evidence was sufficient to show that the elephant was a sly and vicious rogue, and must be approached with caution.

Ten or fifteen elephants that could be relied upon were engaged, and also a force of experienced beaters and drivers. Early one morning the party set out for the capture of the rogue — then supposed to be about thirty miles away.

Their march led them across country, and on their way they saw how easily elephants can overcome difficulties of all kinds. Who would suppose for a moment that so huge and ungainly an animal would be entirely at home in the water? Yet few animals are more so. Upon the first day of the march all the elephants were obliged to swim a deep river; and they plunged in with every evidence of satisfaction. While swimming, their huge bodies were entirely covered; the tips of the trunks alone, through which the big animals breathed, occasionally appeared above the water. They would

now and then raise their eyes also above the surface.

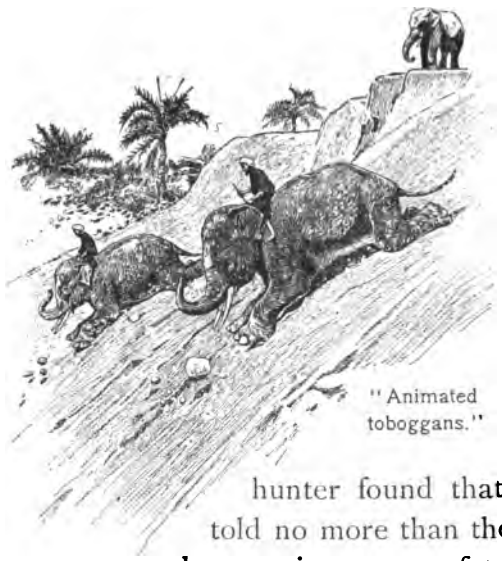
As each elephant carried a *mahout*, or driver, and sometimes several passengers besides, looked at from a distance the appearance of the line was, to say the least, remarkable. The native drivers appeared to be walking through the water, though in reality they stood upright upon the elephants' backs, steadying themselves by ropes attached to their neck or tusks.



"Their huge bodies were entirely covered."

The elephants proved themselves equally proficient in sliding down hill, changing themselves into animated toboggans. The road finally brought the hunters to a cliff so steep that few horsemen would have cared to risk their horses upon it; but with elephants it was a different matter. An old and trustworthy animal, being selected as leader, cautiously stepped over the side and upon

the incline. Here it doubled back its hind legs, stretched its fore legs straight out, and rapidly slid down, making a good path for those that followed. The rest adopted the same tactics, and safely reached the plain below.



"Animated toboggans."

Plunging into the forest again, the party pushed on, finally reaching the neighborhood in which the rogue was supposed to be hiding. The hunter found that the villagers had told no more than the truth. The people were in a state of terror, not knowing at what moment the huge animal might rush out upon them. The night before it had been seen feeding in the rice fields, and probably it was then not far away. After seeing his men and elephants established in camp, the hunter went with the headman of the village to look over the ground.

The native was greatly excited, and told some marvelous stories about the elephant and its doings. He showed the newcomers a field where

the fences had been razed to the ground and trampled to pieces, and the crops eaten or destroyed. The rogue had been there the previous night, and as it would return again to continue its feast upon what was left, the sportsman decided to await it there. In the center of a patch of grain was a framework platform or scaffolding, built by the natives, to serve the purpose of a scarecrow. It was large enough for a few natives to stand upon. They frightened away birds or beasts by beating tam-tams and making other loud noises.

The hunter informed the native that he would station himself on the scaffolding that evening, and shoot the rogue when it came to finish its meal. The headman shook his head, and replied that it was a place of great danger; but the sportsman insisted, and night found him lying upon the scaffolding with several gun bearers, while others were hidden about the field.

The rogue usually appeared at about nine o'clock; but that hour passed, and midnight came, without signs of it. As the hours passed on, the watchers began to think that possibly the animal had made one of its sudden marches and was now far away.

Suddenly a snort was heard, and the next moment a big form could be made out standing among the vegetation. It was the rogue elephant. It

had approached so quietly that no one had heard it. The sportsman leveled his heavy rifle, and, when he saw a good opportunity, fired. The answer was a snort, seemingly of defiance, while the animal charged in the direction from which the flash appeared. Finding only the scaffolding, the rogue seized it and with a single wrench hurled it to the ground. Fortunately, the men were thrown several yards away, and, falling among the vegetation, were not injured. While they made their way to cover, the rogue rushed off into the woods. That it was wounded they discovered the following day, and on a subsequent occasion the animal was killed by the intrepid hunter, who might easily have lost his life at the time the scaffolding was pulled down.

Elephant shooting for sport is becoming a thing of the past in India, the only elephants now hunted for pleasure being these rogues—animals that are dangerous to the community. The complete history of rogue elephants would make interesting reading. They seem to have decided to avenge man's wrongs against their kind. Some years ago one rogue actually took possession of a stretch of country in India forty miles wide by one hundred long, and in a businesslike way proceeded to demolish everything in or about it. The animal rushed into the villages, took huts upon its tusks

and tore them apart, or tossed them until they fell in splinters. It chased the people away or killed them whenever it could, or, standing by the wrecked houses, it ate the grain and other stores.

This elephant seemed remarkably intelligent. It entertained, in particular, a dislike for the watch-towers, or scaffolds. Whenever this rogue saw one, it would creep on slyly, spring at it, push it to the ground, and kill its occupants.

A famous elephant named "Mandla" was once owned by a rich man near Jubbulpore, in central India. Suddenly it began to develop the characteristics of a rogue, and attacked human beings wherever seen. It killed them so cruelly that it became widely known as "the man-eater." It was finally destroyed by an organized effort of English army officers.

An elephant known in India as the "Kákankoté" rogue took possession of a tract about eight miles long in a region of that name, and for months devastated the fields and defied the natives. It terrified the people so that a stretch of road between Mysore and Wynaad was deserted and given over to this elephantine highwayman; for a highwayman it was, ready to pounce upon every one who passed that way. The native authorities for a long time stationed a guard at the entrance of the district to

warn all travelers; and finally the people applied to the government for aid. After being hunted for five months, this rogue was shot.

Another famous rogue took possession of a public road and attacked every passer-by. Suddenly darting from the jungle, it would rush up to an ox cart, seize the driver with its trunk, and disappear. Repeated raids of this kind so terrified the people that a large tract of land was to all intents and purposes deserted; but finally an English hunter determined to rid the country of the rogue. By careful inquiry he found that the elephant always seized the driver, and if there were two carts in company, it chose the driver of the last. So he arranged two ox carts, putting a dummy driver upon the second, while upon the first was a stout bamboo cage, in which the hunter was to sit, rifle in hand. When all was ready the two ox carts started, one day, followed by the best wishes of the community. The fatal district was soon reached, and, about halfway down the road, there came a crash, and the monstrous elephant, dark and ugly, dashed upon the party. Making directly for the last cart, with a vicious swing of its trunk it seized the dummy man and made off, receiving as it went a shot from the cage. But the oxen, alarmed by the uproar, ran away, leaving the road and taking to the open

country. They tipped the cart over, nearly killing the driver and the caged English sportsman. What the elephant thought when it tore the dummy into shreds must be imagined. Some months later this rogue was driven away and caught.

In 1847 the Rangbodde Pass, that led to the famed health resort of Neuera-Ellia, Ceylon, was captured by a rogue elephant. It seized every native who passed that way, closing the roadway as completely as if a regiment of soldiers had been placed there with orders to slay all human beings who tried to go through the pass. One of the last acts of the elephant was to charge upon the cavalcade of a native trader who had never heard of the rogue. The trader succeeded in escaping, but his attendant coolie was seized and dashed to the ground, after which the rogue turned its attention to the stock of goods, coolly inspecting and destroying them, piece by piece. After slaying a number of natives, this rogue was killed by an English sportsman.

An acquaintance of Sir Emerson Tennent, a Cingalese gentleman, had a narrow escape from a rogue that had earned a very unsavory reputation in its neighborhood. The elephant suddenly rushed upon the party from behind a small hill. First it caught an attendant with its trunk, and

hurled him to the ground; then it seized the Cingalese, throwing him upward with such force that he landed in the high branches of a tree, safe and sound, with the exception of a dislocated wrist.

There are several explanations of the rogue elephant's fury, and without doubt one cause is a desire to revenge some ill treatment. This is well shown in the case of a certain Cingalese elephant. Its keeper prodded it very cruelly in the head. The elephant lost patience, and, reaching up, dragged him from its back and hurled him to the ground. Fortunately, the driver fell into a hole or depression, where the elephant did not see him. The elephant, hitherto peaceful, immediately became a revengeful rogue, and started out upon what proved a tour of destruction. It ran through a neighboring village, and broke into a house, and killed the owner. Several hours later it wrecked houses in other villages, and killed natives in four or five towns. The houses or huts were crushed and rent, evidently in the search for human victims, though this rogue did not confine itself to men alone, but attacked horses and cattle. Finally the elephant tried to enter the palace of the Dehra Rajah, and, upon being driven off, returned to the house of its original owner at Bebipur. This house it tried to demolish in order to catch the

persons concealed there. The savage creature was finally captured by a body of men with tame elephants.

An old copy of the "Colombo Observer" contains this advertisement: "ROGUE ELEPHANT.—A reward of twenty-five guineas will be paid for the destruction of the rogue elephant on the Rajawallé plantation." The elephant here referred to had taken up its residence on this coffee plantation, and had so terrified the people that all work was suspended. Its operations and misdeeds were always conducted at night, at which time it would mysteriously appear and devote its attention to destroying buildings, uprooting trees, and demolishing the work of the men. The waterworks, pipes, and other objects on the plantation seemed especially to irritate the animal, and they were torn up or stamped upon and ruined. The rogue was finally conquered by a party organized for the purpose.

Rogues are sometimes merely mischievous. A party of surveyors in India found that the wooden pegs which they set out were pulled up with much regularity by an elephant. The same joker stole a surveyor's chain, and seemed to delight in shaking it about to hear it jingle.

An elephant in a circus or menagerie sometimes becomes a rogue, and during the past few years a number of such instances have occurred.

Ferocious as the rogue elephant appears to be, its record as a man-killer is far below that of other animals. Thus in India, in 1875, the tigers killed 828 persons and 12,423 domestic animals; wolves killed 1061 persons; leopards 187 persons and 16,157 domestic animals; while the elephant is charged with but 61 persons killed, and 6 domestic animals. Rogue tigers, wolves, and leopards are far more to be dreaded than rogue elephants.

SOME BABY BIRDS.

It is in spring that our fields, hedges, and woods resound with the most joyous notes from our feathered friends. In the apple trees, among the blossoms, the robins hold a festival; in the old dead tree over the way we may perhaps find a nest of bluebirds; in the vines around our cottage door a

sparrow chirps about her young; and from an aged hollow-topped clothespole we may hear faint peeps, and may see a little wren disappear within. Even the chimneys are converted into nurseries for the swallows, while the hedges, cedars, and other retreats all form shelters for baby birds.

What a cry for food this great nursery sets up! The slightest noise near the nest, and baby mouths are held up, always open, and seemingly never satisfied. Fathers and mothers work so hard that they scarcely have time to eat. The first worms and insects that come out after their long winter sleep are captured for these babies, and in such numbers that it is a wonder that any are left to enjoy the summer days.

Of all our familiar birds, the little owls are among the most curious. They are mere bundles of fuzz and feathers, and if we are fortunate enough to find the nest, the sight proves an interesting one. The old tree, grim and forsaken, except perhaps by clinging vines and moss, gives little token of the family within; but we draw near the dark hole that once bore a sturdy limb, scratch upon the bark, and, presto! four queer heads, with sharp black eyes, pop into view, exactly as if we had touched a spring — only to fall back as quickly when they find out their mistake.

The old birds mate as early as February, and in May the nursery is begun. Sometimes, as we have seen, it is in a hollow tree or in a crevice in the rock; again, we may find the nest on a large bough high in air. When in this position, the home is formed of large dried sticks; crooked twigs are laid for the foundation, and the interior is lined with soft grasses and sometimes feathers, so that the entire nest is perhaps three feet across. Soon after its completion, four and sometimes six eggs will be found, and then the vigilance of both parents is necessary, as it is the only brood of the season.

"Four heads pop into view."

When the mother bird becomes tired, her mate takes her place and guards the home while she travels off to rob some neighboring farmyard of a stray duck or chicken. The young do not leave their home until they are fully feathered, and they

are fed on rats, mice, rabbits, and small birds, and develop a most remarkable appetite.

In April we may find upon the ground, on marshy shores by some river or creek, a plain nest formed of a few withered leaves and branches, carelessly placed, as if the mother were a poor housekeeper. At this time it perhaps contains five or six clay-colored eggs spotted with brown and purple. Visiting it a little later, we shall find the birds out — the strangest little creatures imaginable.

They lie cuddled together, a mass of brownish-white down. When disturbed they start up and topple over, and appear to be all legs and bills. A great brown stripe runs down the back; another passes through the eye and under it, while others under the delicate wings give these baby woodcocks the appearance of woolly zebras. The legs and long bill are purple, and certainly these are the prettiest of all the bird babies we have seen.

The smallest of the bird babies is the humming bird. The largest was the epiornis, now extinct. One of its eggs was equal in size to twelve thousand humming bird's eggs. The nest of the humming bird is often found in pear trees or apple trees, and is a beautiful structure. The exterior is made up of small pieces of the dark and gray lichens which the mother finds upon trees and

rocks. These are placed all about the nest, and glued together by some secretion from her mouth. Almost always she selects pieces for the outer covering that will match in color the surrounding branches, so that the nest is really protected by its color. In the interior she places layers of the wings of flying seeds, and on these the downy silk of the mullein, with delicate bits of fern.

From this attractive nest two little ones can be seen pushing out their little bills, taking their food from their mother's mouth.

It is generally believed that humming birds can utter only a faint chirp; but John G. Bell, the naturalist, and companion of Audubon on many of his travels, stated that at least one of the hummers has a regular song — a discovery he made in Central America.

Becoming fatigued during a hunt, Mr. Bell threw himself down beneath a richly flowered bush, and soon was attracted by the beautiful hummers that flew from flower to flower. Finally, thinking he heard a little song, he kept perfectly quiet until a tiny bird — the little gray hermit — came quite near him. Then the song was plainly heard. He afterwards paid particular attention to this species, and often heard the delicate intonation, which he describes as like the song of the canary, only lower.

Resembling the woodcock are the baby snipes, which, soon after they leave the nest, run upon the shore, and so much like the pebbles and the sandy beach are they in color and tint that considerable experience is required to distinguish them from their surroundings.

Snipes.

The cunning of the mother snipe is remarkable and almost beyond belief. On one occasion, in walking along the beach with a companion, we turned around a large rock, and up from our feet sprang a snipe, piping with all her might. Over our heads she flew, and alighted on a rock over which we had recently passed, and so near that we could almost have caught her.

At our approach she flew a little farther off and acted very strangely, as though hurt. Then suddenly it occurred to us that she was purposely leading us away. Such was the case, for as we returned she followed us with loud protest, and near the rock from which she first flew we found

her family of baby snipes, just large enough to start away and give us a chase.

We caught one, a beautiful little creature with gentle, dovelike eyes, that seemed quite content to cuddle in our hands and utter a gentle peep not louder than the voice of a mouse; but the poor mother's anxiety was so evident that we gave the little one its liberty, and its diminutive legs soon carried it to a place of safety.

This trick of attracting people away from the nest is often repeated by the old snipes, and one has been seen to hop along on one leg, with wings drooping, until the innocent sportsman was well away from the young, when off she would dart to rejoin them when the field was entirely clear. The spotted sandpiper protects its babies by the same device.

The baby herons are laughable little creatures, for when they are first hatched, they differ little in appearance from an ordinary puffball; when a little older, they are fuzzy objects, seemingly covered with long hairs. Those who have visited Cape May may have noticed their nests in the cedars near there, where the blue heron, little egret, and green bittern all live in a colony.

Some curious black babies are seen in young rails, which, in the spring, are found in the marshes

along creeks and rivers of the Middle States. The nest is built of grass, and the moment the eggs are hatched, off run the little ones, looking like mice running in and out among the grass.

The young of the clapper rail are very similar, only they are larger, and covered with black down, with one or two spots or streaks of white, one spot being near the bill. The clappers make their nests near the sea, where they are often washed away by heavy gales. After such a storm the males have been seen walking about, as if disconsolate, near where their nests have been, while hundreds of the dead mothers have been seen strewn around, showing that they died with their little ones.

The young of the Virginia rail frequently share the same fate, and so great is the mother's grief that she seems forgetful of all fear, and cannot be driven from the spot where her nest stood.

A SUBMARINE RAMBLE.

"YES, I have seen some queer things in my walks under water."

The speaker was a tall, athletic man, who but a few moments before had resembled some strange monster, as he rose from the water incased in the heavy armor of the professional diver.

"But," he continued, "I can tell you that I don't follow the calling from any love of sport. It is a dangerous business at best, and whenever you go down, something may happen that will anchor you firmly to the bottom."

"How did you come to be a diver?" asked one of the younger listeners.

"Well," was the reply, "I might say that it was by chance. When I was a lad, I lived in London, and, like all boys, found the docks and the great ships that lay there, hailing from all parts of the world, a great attraction; so a part of every day that I could gain for myself was spent in walking about the great piers.

"One afternoon I was watching some riggers at work on a large ship. Upon her rail was suspended a sign that read: 'For Calcutta, Bombay, and the East Indies, September 30.' I was wondering what kind of a place Bombay was, when a man stepped ashore, and, coming up to me, said, 'My lad, can you find me a good swimmer about here?' 'I'm a fair swimmer myself,' I answered. 'You?' he said, eying me from top to toe.

"I was not very large," continued the diver, "but I happened to be a good swimmer, so finally he took me aboard and down into the cabin, where the captain asked me whether I could dive under the

ship's keel and see if her copper had started. As I had often dived under vessels for the fun of it, I replied that I could, and in half an hour I was overboard and swimming down to the place. There, instead of a 'start,' as they call an opening in the copper, I found something sticking in the hull — what do you think? Nothing more nor less than the sword of a swordfish.

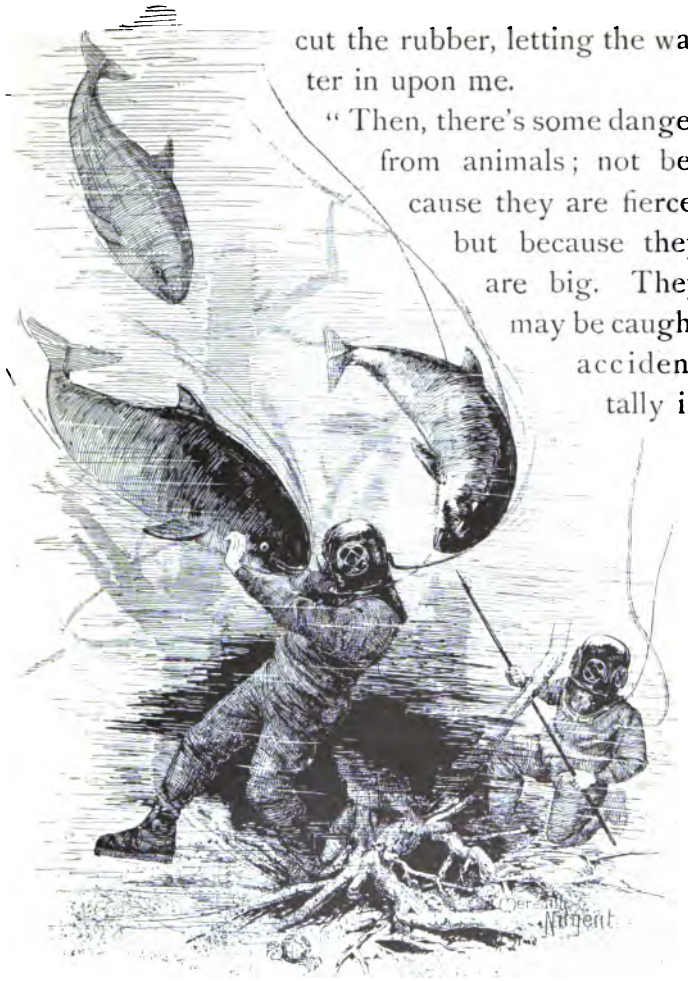
"When I told the captain, he said I had done as well as a diver, and gave me a sovereign.

"Of course, everybody heard of it, and whenever there was anything lost overboard, or a vessel's bottom to examine, I was sent for. From calling me Richard, they soon took to giving me the name 'Diving Dick.' So you see it was very easy for me to slip into diving as a business.

"When I began this work at regular wages, some divers went down in diving bells; but generally they wore the armor. They have improved the armor so much that now it is comparatively easy to go down. In old times, we had to grope around and do the best we could; but now we carry an electric light, have a telephone attached, and are able to talk or signal to those above. My armor, as you see," said the diver, pointing to his suit, which looked like the cast-off shell of a curious animal, "is of thick, heavy rubber, and in

two parts, the trousers and shoes being in one piece. The headpiece is of copper, with two eye-holes, or windows of glass, that screw on. In deep water, where the pressure is great, a thick breast-plate of copper is used, heavy weights are hung from the back, and we often put a weight of fifteen pounds on each foot. That, of course, is to keep the diver from floating. Three lines and tubes are now generally used. One tube lets air into the helmet; another takes it out. Then, there is the telephone wire, and a signal rope, besides; so that in shallow water there is little or no danger. If the tube should break, or your suit be cut in any way, there is a possibility of drowning before they can haul you to the surface; but, luckily, such accidents seldom happen.

"In 1856, I went down ten fathoms in rough water, off the coast of Portugal, to a steamer that had sunk, nobody knew exactly how. I landed on her foreyards, and then went down the shrouds, finally dropping to the deck. As I struck I heard a gurgling sound, and had just time to signal to be hauled up, when I felt the water on my face. I had lost my senses when I came up. I went down again, and found that, in descending the first time, my tube had passed over what had been the port side light, and the sharp-edged, broken glass had



cut the rubber, letting the water in upon me.

"Then, there's some danger from animals; not because they are fierce, but because they are big. They may be caught accidentally in

"A school of porpoises came dashing by."

the ropes or tubing. Some years ago, with two other divers, I went down near the Florida coast.

The wreck, this time, was a ship loaded mainly with cotton. She had struck on a bar during a hurricane, been blown completely over, and then had sunk in a channel inside the reef. The exact place was not known; consequently, the only thing to do was to go down and hunt for her. So we started in twenty feet of water, and, all holding to one rope, so as not to lose each other, separated, gradually walking down a hill into deeper water.

'I think we had gone about a hundred feet before I felt a twitch on one part of the line, and looking around, I saw several large black objects headed for us. Before there was time to think, a school of porpoises came dashing by. I stood quite still, and probably they took me for a rock or other natural object, for one of them passed so close I could have touched it, and another grazed the tube. But my companions tried another plan: they struck at the porpoises with their pikes. For a time we were in a regular school of these animals, and were afraid the tubes would be fouled; but they left us before long, and we again took up our march.

"It was some time before we found the ship, and then she was so covered with sand that we had come upon her bulwarks before we knew it, thinking her a sand hill. All her masts had been carried away, and she was lying upon her side, almost

covered. Fortunately, the hatches were battened down, or she would have been filled with sand. By the aid of crowbars, we soon broke them off, and then we saw a curious sight. All the light cargo nearest the hatch began to rise, the inside air forcing out barrels, boxes, planks, and bales of stuff in rapid succession, so that there was a regular procession of objects climbing up from the ill-fated ship. These were caught by the wreckers above us and hauled ashore.

"This place was a famous spot for fishes, and many were beauties, being striped with bright green, yellow, blue, and red. Others had long streamers, and looked like the Harlequins and Columbines in pantomimes. I noticed that there was the greatest difference between them in their habits. Some were shy, and darted away at the slightest motion, while others seemed to think me a huge fish, and came near me as if curious to see what I was like. Some swam over my arms and let me move my hands toward them; but most were shy. As to the stories of sharks, they are in the main not true. I have had a shark come within five feet of me, and when I raised my arm it darted off in such a hurry that the boiling of the water nearly threw me off my feet. Of course, there may be cases where a very large shark might attack a

diver; but if he should attack one wearing the modern diver's helmet or armor, I think the shark would have a hard time of it; copper and glass would not make a very good mouthful.

"A friend of mine had a funny experience," the diver continued, seeing that his audience were interested. "He was walking along on a sandy bottom, when suddenly he was lifted upward, then thrown quickly backward, and, if it hadn't been for his pike, he would have fallen over. For a few seconds the water was not clear. Then he saw that the cause of his upset was a big skate that had been lying partly buried in the sand — asleep, perhaps. He had stepped with his leaden shoes right on its back. I'm sure it would be hard to tell which was the most scared.

"Among the strange things that may be seen by divers is the ocean forest, off the eastern coast. The sandy bottom there is covered with the hardened roots of great trees, and, in some instances, parts of trunks are standing, showing that the coast there must have settled, and that the sea has rolled in over the land.

"Sometimes we go down at night, and then the scene under water is often a beautiful sight. Every jellyfish and living creature seems to be ablaze with light; your rope appears to be on fire, and every

motion makes the water glimmer. The crabs and fishes sparkle, many with a light of their own. So, you see, instead of being a dark and barren place, as the majority of people seem to regard it, the ocean, even at the greatest depths, is probably made bright by the very animals that most need the light."

The boys bade the diver good-by, feeling glad that they did not have to share his perils, but regretting that they could not see the beauties of which he had told.

WAR ELEPHANTS.

THE back of an elephant would hardly be considered a safe place in a modern battle. The huge animal would be riddled by bullets and round shot, and, far from being an object of terror, would be a conspicuous target for the enemy.

In ancient times, long before the invention of gunpowder, the elephant corps was an important feature of an army, and was relied upon not only to charge upon and trample down the opposing beasts, but to terrify and put men to flight; and that the huge animals understood the object of the fighting we have every reason to believe. Elephants were then plentiful; bands of thousands were not uncommon; and a host of them, fitted with rich harness

and trappings, protected by shining armor, and bearing towers containing archers and slingers, must have made a magnificent and imposing spectacle.

Exactly when the elephant was first used in war is not known; but history tells us that when Cyrus sent an expedition against the Derbices, their king concealed an army of elephants in the forest. A sudden charge by these monsters utterly routed the cavalry of Cyrus. This Indian king went to war with ten thousand elephants. All this happened four hundred and fifty years before the Christian era; and how many years before this elephants were used in warfare we can only surmise. Pliny and Arian tell us of elephant armies numbering in one case five hundred thousand, and in another seven hundred thousand. These figures we may well doubt, though it is known that great numbers were employed by the Indian kings.

Alexander was one of the first of the famous kings of history to tell of fighting against an elephant host. His invading army had reached the river Hydaspes, and as the warriors looked across they beheld the opposing army of King Porus, who had not only chariots and an enormous army, but "the huge creatures called elephants." These great animals, which stood on the farther river bank

shrieking and trumpeting, filled the soldiers of Alexander with terror and dismay.

The two armies watched each other for several days; then Alexander succeeded in crossing the river, and the two forces drew up in line of battle. The Indian king placed his elephants in the front rank, one hundred feet apart, thinking in this way so to frighten the horses of the foe that the entire army would be put to flight. Between the elephants were foot soldiers, and at the ends of the line were large elephants bearing strong towers filled with armed men. King Porus himself was borne upon an elephant of unusual height, probably as large as the famous Jumbo.

When King Alexander, who was a very brave and valiant man, saw the orderly foe, he said: "At last I have met with a danger worthy of the greatness of my soul." Evidently he had due respect for the elephant soldiers that opposed him.

Alexander moved his forces to the attack, and poured in a shower of arrows and spears. The elephants stood like a stone wall, trampling the foot soldiers beneath their heavy feet, seizing them in their trunks, and delivering them to the soldiers upon their backs, or tossing them high in air. The elephants were evidently the main hope of King Porus, and, perceiving this, Alexander directed

men armed with scythes and knives to attack them. These warriors chopped at the elephants' feet and tender trunks, until, in terror, the great creatures turned and began a stampede that was disastrous to the foot soldiers of their own side, for they trampled upon them, and in their flight mowed them down like grain. Alexander followed close after the elephants upon his wounded charger; and finally, the battle was lost to Porus because of the elephants themselves. King Porus, being wounded during the hurried retreat, desired to alight. The driver ordered his elephant to kneel, whereupon all the elephants, having been accustomed to obey in concert, did the same; and the soldiers of Alexander fell upon them, and gained a complete victory.

It is said that elephants which survived this famous battle were revered for years by the Indians, and honored much as are the veterans of our wars. In an ancient book, the "Life of Apollonius of Tyana," he is said to have seen in a town of India an elephant which the people held in the greatest respect as having been owned by King Porus. It was perfumed with sweet essences and decked with garlands, while upon its tusks were rings of gold, inscribed with these words: "Alexander, son of Jupiter, dedicates Ajax to the Sun." The elephant Ajax, according to Apollonius, was the old war ele-

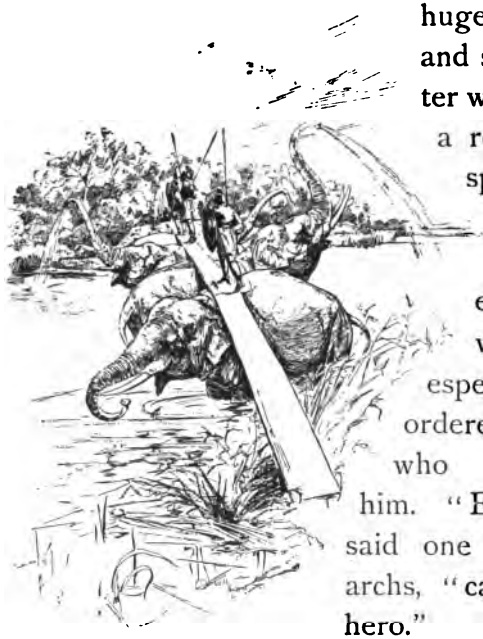
phant of Porus in his battle with Alexander, and had survived and lived in honorable idleness for three hundred and fifty years.

While Alexander defeated the elephant corps of Porus, he saw that they were good fighters, and created the office of elephantarch, or chief of elephants; and afterwards, visiting monarchs found him surrounded by the largest elephants, magnificently harnessed. Alexander was proud of the huge elephants of his court, and fond of displaying their intelligence; and the trainer who succeeded in making the elephant accomplish the most wonderful deeds was highly honored.

On one occasion some elephants were being shown to an eminent general, when the latter remarked that evidently they could perform any service that a man could. "They might even bridge a stream," he added.

No sooner were the words uttered than a signal was given, and the herd was marched into a stream that rushed by the camp. The well-trained animals waded into the water, which was four or five feet deep, and arranged themselves side by side, some heading upstream and others down. Men now ran forward with planks; some were placed against pads upon the backs of the animals, while others were continued from back to back; and in a re-

markably short space of time an elephant bridge was ready, over which the soldiers passed, while the huge animals trumpeted and sent streams of water whirling into the air, a remarkable and inspiring spectacle.



"An elephant bridge."

On another occasion one of the generals of the army, who had displayed especial bravery, was ordered before the chief, who publicly thanked him. "Even my elephants," said one of the elephant-archs, "can distinguish the hero."

At this the crowd fell back, and a gorgeously ornamented elephant approached, bearing in its trunk a wreath of oak leaves. Walking up to the hero of the hour, it dropped upon its knees, placed the wreath upon the officer's head, and then retired amid the shouts of the admiring soldiers.

Undoubtedly the driver who sat upon the animal's head had much to do with this performance,

but we must admit that the elephant exhibited wonderful intelligence in carrying out orders so exactly.

Elephants were used in various wars after the time of Alexander. One general employed sixty-five to batter down the walls of a city; but they were destroyed by ditches skillfully dug by the besieged.

Hannibal, Mago, Scipio, and many famous generals used elephants in war, relying upon them generally to frighten the foe by their huge, strange forms. Some of the war elephants presented a remarkable appearance, as the tusks of the huge animals were made longer by metal coverings, or long knives with which to cut and cleave the enemy.

In modern times the elephant has been used in war, and to-day forms a corps of the British army in India.

In the army of Aurengzebe, an emperor of India, the elephants dragged the artillery, lifting the cannon wheels from the mud when mired, and in some instances carrying the guns upon their backs.

The elephants of Akbar, another emperor in an early period of the Mogul empire, were armed after the fashion of knights, being protected by great coats of mail fitted to their bulky forms. The fol-

lowing description of such armor is taken from an ancient book:

"Five plates of iron, each one cubit long and four fingers broad, are joined together by rings, and fastened round the ears of the elephant by four chains, each an ell in length; and between these another chain passes over the head, and across it are four iron spikes and iron knobs. There are other chains with iron spikes and knobs hung under the throat and over the breast, and others fastened to the trunk; these are for ornament, and also to frighten horses."

There was also a kind of steel armor that covered the body of the elephant, with pieces also for the head and proboscis. One historian adds that "swords are bound to their trunks, and daggers are fastened to their tusks."

It can well be understood that the approach of several hundred elephants covered with clanking armor, their tusks bearing daggers, and their trunks swords, struck terror to the foe. The Sultan Ibrahim marched his elephants against an army of Alim Khan, and utterly put the men to flight. They looked at the huge monsters for a single moment, then fled in utter rout.

The army of Timour, when on the plains before Delhi, was almost frightened away by the elephants,

and he prevented a retreat only by digging ditches and building great bonfires about his army. The force arrayed against him was that of the Sultan Mamood (A.D. 1399), who had a corps of elephants armored with cuirasses, while upon their tusks were poisoned daggers. The towers upon their backs bore archers and slingers, and upon the ground by their sides were throwers of pitch and fire. On the sides of the elephants were musicians, who beat bass drums and made a terrible din with their bells and cymbals. This, with the shrieking and trumpeting of the elephants, might well have carried terror into the hearts of the men.

But Timour by mere force of will put to flight the foe. His grandson, a youth of but fifteen, wounded a large elephant, whereupon the men upon its back were thrown, and the young warrior drove the animal into Timour's camp.

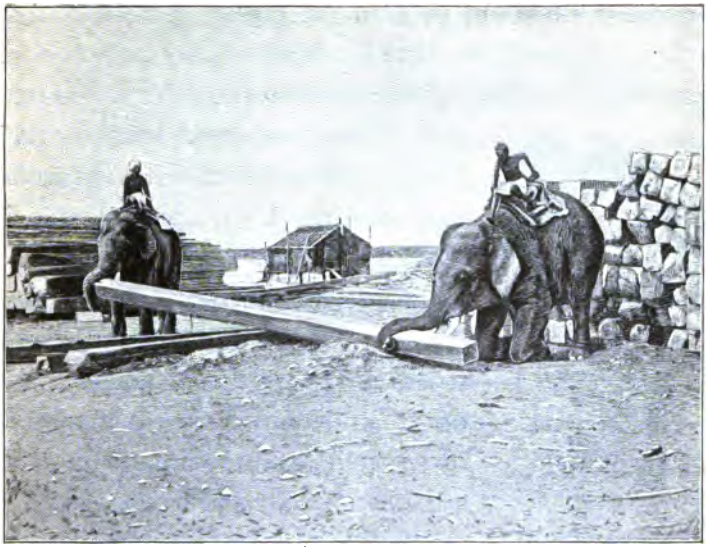
While the elephants were defeated here by the skill of Timour's attack, the latter saw their value in battle, and two years later we find him using elephants in Syria. In the famous battle of Aleppo, the front rank was protected by elephants, mounted by archers and throwers of Greek fire (a sort of burning pitch). Timour had trained his elephants to hide or coil up their trunks when attacked at

this tender point, and this aided him in winning a great victory, the elephants completely routing the enemy.

It was in processions and pageants that elephants made the finest appearance, fitted with magnificent trappings, and marching slowly along, as if conscious of their fine appearance. One of the most remarkable displays was that at the wedding of Vizier Ali, in 1795. Here twelve hundred elephants were in line, all richly costumed. Of these, one hundred had howdahs, or castles, covered with silver, while in the center sat the nabob upon a very large elephant whose howdah was covered with gold set with jewels.

The daily parade of the elephants at the court of Jehanghir was a wonderful display. The elephants were bedecked with precious stones, chains of gold and silver, gilt banners and flags. The first elephant, called the "Lord Elephant," had the plates of his head and breast set with rubies and emeralds, and as he passed the king, he turned, dropped upon his knees, and trumpeted loudly — not in loyal frame of mind, exactly, but because the driver pricked him with a sharp prod just at the right time.

The elephant is still used in India in pageants, and as a laborer, especially in the lumber dis-



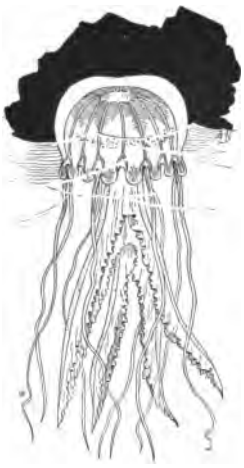
"The elephant is taught to carry long timbers."

tricts, where it is taught to carry long timbers, and, as has been said, it forms a corps in the British army; but in active warfare it is now useful only in a few cases, and can never be employed so frequently as in ancient times.

A LIVING UMBRELLA.

ANY one who has drifted along the rocky shores of the Atlantic or Pacific coast, with face near the water, must have noticed the myriads of jellyfishes passing and repassing in the current. They form

endless lines and columns in certain places, and at night convert the ocean depths into a scene of splendor by their phosphorescence. As we watch them they suggest many other forms. Here one with graceful and elongate train appears a veritable comet; another seems devoid of tentacles, and resembles a crystal ball suspended like a mimic world in the watery space. Another and larger kind is almost exact in its resemblance to a curiously colored umbrella with a clumsy handle. We can almost count the ribs that appear to radiate from the top downward; and here is even the lace with which the edges of some umbrellas are decorated. In fact, so perfect is the imitation that it is a wonder that the jellyfishes have not been called the sea umbrellas.



A Jellyfish.

Umbrellas are protective, or intended to be; and let us see if this floating, jellylike one is not. We steady the boat, and soon one comes swimming slowly up until its shining disk is exposed. We sink a glass beneath it, and have the curious, watery creature (for at least ninety-five per cent of it is water) in the prison. What a mass of tentacles!

and how they twist and writhe, some lengthening out, others being hauled in like fishing lines. It is soon evident that we have captured something else, as, darting in and out, rushing wildly here and there, are a number of little pink-and-white fishes, looking for all the world like animated bits of tentacle darting about. But they are fishes, and in a few moments we see them hiding up beneath the great umbrella — literally in a house of seeming crystal, and surrounded by tentacles. We might think this an accidental occurrence; but lift another jelly, and one or more fishes are seen, as before, and we come to the conclusion that these living umbrellas afford protection to the little fishes, which may be said to have living homes.

The different jellyfishes often have attendants peculiar to themselves; but in most cases the little fishes are relatives of the common mackerel, and, curiously, they resemble almost exactly the tints and colors of their protectors, so that it is often difficult to detect them, and in many instances, in semitropical waters, I have failed to distinguish them when only a few inches away. Knowing the power of the stings of these jellies, we may well wonder how the fishes escape; but they are probably aware of their danger, and swim well up under the umbrella of their protector.

The jellyfishes are not all the delicate forms we are most familiar with; they sometimes attain gigantic proportions. A few years ago a fishing schooner sighted from her topmast, at night, something which appeared to be a vast submarine moon, moving slowly along, followed by a luminous train. A boat was sent out to investigate, and the "moon" was found to be a gigantic jellyfish, known to science as the cyanea. It was fully six feet across, and no one knew how long; yet large as it was, it grew from a delicate little hydroid hardly visible to the naked eye. One of these giants was observed near Boston, with a disk nearly seven feet across, and tentacles over one hundred feet in length. They, too, are umbrellas, and afford protection to a number of fishes and often a wandering sea anemone, as well as several crabs, the entire colony floating about, and forming one of the most remarkable objects to be seen in the great ocean.

When near rocky points in our northern waters these huge jellies are often objects of curiosity to birds and seals. The latter, probably, have noticed the school of little fishes that have dashed at the jelly and disappeared in its folds, and, sinking quietly, the big-eyed seal rises directly beneath the great disk, and stands fairly under the living um-

brella itself, presenting a comical appearance, staring about in wonder, until contact, perhaps, with the tentacles that come sweeping by suggests that living umbrellas are not intended for the use of seals.

In tropical waters fishes that live at the surface, as the gars and others, often avail themselves of the shade afforded by floating objects of various kinds. I have seen little fishes collected under a sleeping turtle, which was lying partly submerged, and thousands of fishes of all kinds will congregate under the hull of a vessel lying at a wharf. All large, slow-moving fishes have their corps of attendants. The sharks have the clinging remora and active pilot fishes. The great sheepshead is often accompanied by small fishes; and whales, rays, and many others are protectors to a horde of creatures of whose existence they are probably ignorant.

In some of these instances the protector, the living umbrella, may be compared to a ship, while the little followers are the tenders. This is shown in the beautiful animal known as the physalia. Found more commonly in southern waters, it is occasionally washed ashore on Cape Cod, stranded like a fairy ship, as it is. It floats upon the surface, the upper portion resembling a bubble of

satin, sometimes as large as a man's closed fist. From the upper portion rises a delicate, fluted, pink-tinted sail, which can be elevated or lowered at will, and when thrown to the wind the living ships go scudding before the breeze, often to be stranded upon the coral keys. After a storm on the Florida reef, I have seen a row of them several inches high, piled up, and extending for some distance. The keel of the fairy ship is represented by a mass of tentacles, colored a brilliant purple, attractive to various fishes, and lowered by this gay craft as lures. A sardine sees the highly colored line, snaps at it, and turns over as if dead; the lassos of this terrible armament have killed it as would an electric shock. I once accidentally swam over one, and narrowly escaped with my life; and for months after I could have passed for a tattooed man, so indelibly were the tentacles stamped into the flesh. Deadly as are these stings, the physalia gives protection to a number of little fishes allied to the mackerel family, which can be found hiding up under its lobes, in some way avoiding the death-dealing darts. As in other cases cited, the fishes are almost exact in their resemblance to the tentacles, a deep purple or blue, and ordinarily cannot be distinguished from them; but when the physalia is lifted from the water by

the sail, which can be safely done, they are seen moving wildly about, generally seeking protection beneath the boat, and returning to their protector as soon as it is put back into the water. In all nature we find these strange associations, seemingly dangerous to the animals, yet in some way resulting in benefit to both.

FEATHERED GIANTS.

In studying the history of living animals, we find that in many cases we can trace their ancestry, directly or indirectly, to a line of giants.

There seems to have been a period in the early history of our world when nearly all animals attained to a greater size than at present. There were antelopes as bulky as the largest elephants; there was an elk upon whose horns forty or more boys and girls could have been carried; the elephants were much larger than they are now; the little lizard, iguana, of South America, was represented by an enormous creature, the iguanodon, twenty feet or more in length, and powerful enough to tear down large trees; the lions, tigers, bears, kangaroos,— in fact, nearly all the animals,— were giants.

We should hardly expect to find this applying to the birds; the great ostrich and others seem almost

giants themselves. Yet during the days of the earliest man there existed birds which might well be termed giants.

The home of some of these feathered wonders was in New Zealand, a land which has produced many strange and curious creatures, living and extinct. The first information concerning the birds was obtained from the natives, who told the Englishmen who ventured among them that the ancient Maoris were powerful people, and the earliest owners of the New Zealand country. Their traditions described them as great hunters, famous for their deeds of prowess and personal bravery; and among the dangerous animals which they pursued and destroyed for the sake of the wonderful feathers was a gigantic bird that was twice as high as the tallest chief, and that was larger, stouter, and stronger than any other animal they had to cope with. So powerful, indeed, were the great birds that only the bravest men attacked them, and their feathers were worn only by prominent chiefs, the possession being a distinction that corresponds to the decorations given to brave warriors at the present day.

Not only were the feathers valued by the ancient Maoris, but the flesh was eaten, and the bones made into fishhooks and weapons of various kinds. In the songs of the natives the name of the moa often

occurs, and so much was heard of this feathered giant that the naturalists thought, possibly, there might be some truth in it, and immediately began investigations which resulted in finding the remains of the great birds.

It was shown that about five hundred years ago these birds flourished on the different islands in great numbers, being finally exterminated by the Maoris, although there are some who believe that the great creatures still live in the high mountain lands of the interior. The greater number of the most perfect skeletons were discovered in caves. In explanation of this, the natives said that, according to their traditions, the country was consumed by fire from the volcano of Tongariro, and that the birds, being thus driven to the caves, were there imprisoned. Many, doubtless, died a natural death, or were killed by a change in the climate.

One of the largest deposits was found in a swamp. Upon the peat being removed, many tons of the bones of the gigantic birds were exposed, and it would seem that here the unwieldy creatures had fled to escape their enemies, either man or beast.

In appearance the moas were huge, impressive creatures, the largest being over thirteen feet in height, with rudimentary or no wings; its legs ap-

peared more like great columns for support rather than for locomotion, and the bones themselves were larger than those of an ox.

Moas.

Such powerful animals could not have submitted tamely to capture; and while the Maori legends hint at the danger of the chase, we can well imagine that it was only after a fierce struggle that the great game gave up.

If in flocks, their mere rushing along would have been a wonderful sight, and few animals could have withstood the charge. In some localities the eggs were found, and in one spot a number were grouped together, suggesting that perhaps there had been a nest of the huge creatures, and that from some cause they had been led to desert it. Single eggs have been found in the caves, burnt and charred, showing that they formed a part of the food of the ancient tribes.

Although the moa eggs are much larger than any known at the present day, they are dwarfed by the eggs of a feathered giant which once lived on the island of Madagascar. Several years ago, the captain of a trading vessel made his way up a shallow river that found its way down to the sea at the southern extremity of the island, and there fell in with some native tribes that rarely mingled with newcomers or whites. Among the many curious objects noticed by the captain and his men about the native village were some dishes that were used to hold water and food of various kinds. They held about a gallon of liquid, and were round at the end, so that they had to be propped up. They proved to be enormous eggshells, capable, when entire, of holding over two gallons of water, or, to be more accurate, equal by exact measurement to one hundred and fifty hen's eggs.

From the owners the captain learned that the eggs came from a locality not far distant; and an expedition was formed later, that resulted in the discovery not only of the eggs, but of the remains of four distinct kinds of enormous birds, buried in vast sand heaps, that had perhaps blown over them and their nests. Natives were hired, and large trenches were dug in various directions, that exposed many of the bones.

In one spot a great number of eggs were uncovered, but they were mostly broken. Their being grouped together, however, pointed to the belief that here was the nest of the great epiornis, and was probably the largest bird's nest in the world. The sand was carefully worked away, and the great shells exposed; but nearly all were damaged or cracked, and the sand had drifted into them, making one a good load for a big boy. But the nest was soon robbed, the workmen marching off with the finds upon their shoulders, to deposit them in a place of safety. Perfect shells are extremely rare, and are valued at many hundred dollars apiece.

If the moas were considered dangerous to attack, what must have been the aspect of these huge creatures when at bay? If they were hunted by early man, we can well imagine that strategy, instead of open chase, must have been the method of capture. Perhaps pitfalls were dug, and the great game driven into them, where they were destroyed by the rude stone clubs and spears of the natives.

The strange tale of the roc, told in the "Arabian Nights," is supposed to have been taken from a legend of this gigantic bird.

When the first discoverers of the Mascarene Islands investigated that locality, they found, among other strange animals, a number of huge birds with-

out wings, which, however, were remarkable for their power of running. One was a rail which stood a foot higher than the tallest man, being over seven feet in height. The bird was so beautiful and curious that the sailors followed it whenever an opportunity offered, and the natives, finding that they could readily use them in barter, also began what resulted in a war of extermination. The poor birds were pursued by the hunters day and night, through swamp and forest, until they were finally brought to bay, and, after a struggle, reduced to subjection.

A few years of such incessant hunting greatly lessened their numbers, and finally they were entirely destroyed, the last one having been observed in 1694; and to-day not a single bone or feather remains to tell the story of this giant among its kind.

Among the other curious birds of this and other islands was the giant of the pigeons, a bird as large as a swan — an immense pigeon, with fluffy, curly feathers, but incapable of flight. When Mauritius was discovered, in the sixteenth century, this bird was common, and was killed by the sailors in great numbers — by some in wanton sport, and by others for the curious stones found in its stomach. It was hunted so continually that it soon ceased to exist.

The last living one was seen by the mate of the English ship *Berkley Castle*, in June, 1681, and to-day not a single specimen of the great bird is known. A foot in the British Museum, a head and foot at Oxford, and a few other bones, are the only relics to tell the story of the existence of the king of the pigeons, the famous dodo.

Many centuries ago, in France, when man lived in caves, there lived a gigantic bird called the gastornis, a great gooselike form that towered aloft thirteen or fourteen feet, and was a most powerful creature. It probably lived near the streams in marshy spots, depending upon its powers of running to escape its enemies, as it had no wings. About the locality where the city of Rheims now stands, the remains of this great wader and swimmer have been found in the caves, mixed in among the bones of other animals, as the great mammoth and cave bear, which are known to have lived dur-

Gastornis.

ing the time of man, by whom they were undoubtedly hunted and used as food.

But these were not the greatest of the giants of this olden time. The largest of the wingless birds, as we have seen, was the great moa, whose plumes were worn by the victorious Maori chiefs; but even these had feathered enemies — enormous eagles or birds of prey, as the harpagornis, large and powerful enough to have borne the largest of the dinornis tribe through the air to its nest. Surely the roc, as it is pictured by the old Arabian story-tellers bearing Sinbad away, is not so much of an exaggeration after all, as, if the harpagornis could make the moa its prey, it could easily have borne away several human beings.

Another giant was a huge goose, called by the naturalists cremiornis; while others, of less stature, though gigantic when compared to their living representatives, have left their remains in caves and various deposits, speaking monuments of their greatness, and of the age of wonders in which they lived.

INSECT FISHERS.

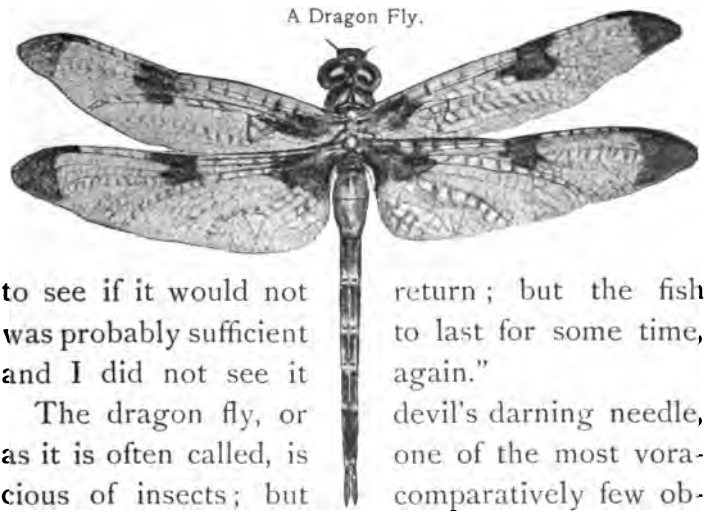
"I WAS fortunate once," said a naturalist, "in witnessing an occurrence which impressed me as being very curious, considering that the principal was

a beautiful insect, one of the darning needles' which we feared when children. It was in the Southern States, and one warm summer day, I had been walking downstream for several hours, whipping it diligently for trout, and finally, weary, had gone ashore and started through the woods to the place where the team was to meet me. Half a mile in, I came to a little pond hardly twenty rods wide, which, with its surroundings of wild roses and other flowers, was so attractive that I threw myself down upon the bank to revel in the scene; and, indeed, there was quite enough to delight either a botanist or a zoölogist. On a half-submerged log were several turtles asleep in the sun; the clear water of the pond was broken here and there by fish rising, while birds of various kinds fluttered about, singing and chirping in high glee.

"While I was looking at the water I noticed a large insect come dashing over the pond like a flash of light. It was one of the largest of the darning needles, with great, lacelike wings, its iridescent tints gleaming in the sunlight, so that it appeared like a veritable gem flitting about. It sailed across the pond several times, and then, to my astonishment, deliberately dived into the water just as a kingfisher would, and with such a force that it nearly disappeared, rising almost instantly,

and darting off. At first I thought it had been struck by another insect and had fallen; but in a few moments back it came and dived into the water again, this time rising heavily, and I distinctly saw that it held between its feet a tiny minnow, which it bore away to a bush on the bank, a moment later disappearing from view. So here was an insect fisherman — perhaps the first on record. I waited

A Dragon Fly.



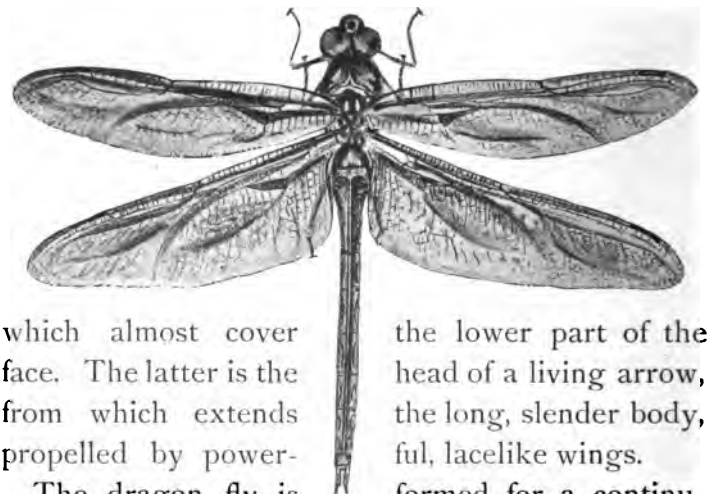
to see if it would not return; but the fish was probably sufficient to last for some time, and I did not see it again."

The dragon fly, or devil's darning needle, as it is often called, is one of the most voracious of insects; but comparatively few observers have seen it dive into the water and lift out a fish of perhaps twice its own weight—an act which might be compared to that of an eagle carrying off a full-grown man.

The dragon flies are extremely interesting creatures, and have a most remarkable make-up. They

are literally all eyes and wings, the former, in some cases, completely encircling the head. The mouth calls to mind that of the grasshopper, but the under lip is a curious organ, in which the palpi, or feelers, are modified so that they form saucerlike objects

Common Green Darning Needle.



which almost cover the lower part of the face. The latter is the head of a living arrow, from which extends the long, slender body, propelled by powerful, lacelike wings.

The dragon fly is formed for a continuous aërial existence, and is never seen walking, but nearly always on the wing in headlong flight, its monstrous eyes on the lookout for mosquitoes and other game.

The darning needle is a fisherman not only in its adult stage, but in its incomplete or pupal form. Its transformations are among the most interesting of all insects, and are easily observed. The libel-

lula, when laying, alights upon a spear of grass projecting above the water, attaching the eggs to a part of the submerged stem, though some are not so careful, but drop their eggs into the water while hovering over it. If the spear of grass is examined after this operation has been performed, it will be found that not only has the egg been attached, but the insect has cut a hole in the grass and inserted it in the orifice, so that it is thus perfectly protected.

If the great-eyed dragon fly is a curiosity, the larva is still more so. In early life it exhibits all the characteristics of courage and ferocity that are the features of the adult form. Generally it is a stout-bodied creature, resembling somewhat the grasshopper, lying in the ooze at the bottom of ponds, and continually foraging for game, for the capture of which it has a wonderful organ. Its powerful legs enable it to crawl, but it has still another method of propulsion, almost unique in its way. The end of the intestine opens into an orifice at the hinder portion of the body, the walls of which are perforated with minute holes, through which air that is taken from the water in the chamber passes, and so permeates the body; in fact, the insect breathes in this way. When all the air is extracted from the water the walls contract suddenly, forcing the water out violently, thus pro-

pelling the larva along several inches, so that respiration and locomotion may be said to be accomplished by the same act.

When a prospective victim is seen, the larva darts forward, and from its head there appears to extend a telescopic apparatus that clutches the prey and draws it back. This is the so-called lip, or mask, which, when the insect is at rest, forms a broad mask, covering the jaws; but at the moment of attack this combination of jaws is thrust forward, and the under lip is darted out like a veritable grappling iron. The hooks at the extremity pierce and draw the victim to the jaws, where it is torn in pieces by the ferocious larva. By means of this armament this predatory insect creeps upon small fishes, seizing them before they are aware of its presence, and, when among young trout, doing great damage. After passing some time in this stage, the larva changes and becomes a pupa, literally bursting from the old skin, that opens along the thorax, now showing upon its back two little pads, which are the rudimentary wings.

When the time for the final change comes, the pupa climbs upon some plant, and approaches the surface. The pupal skin bursts open along the back, and from the shell emerges, limp and seemingly lifeless, the adult dragon fly. For several hours

it clings to the plant, the warm sun completing the transformation, seemingly painting it with gorgeous colors, and imparting strength and vigor; for soon its wings appear stiff, rigid, and glistening, when, like a dart, the newly born creature is away, and its life in the sunshine has commenced. The dragon flies are of undoubted use in capturing other insects. They prey especially upon mosquitoes, and in some sections are known as mosquito hawks. In Lombok, Malay Archipelago, they are considered a great delicacy by the natives, who capture the large species by attaching a gum to a long pole, so that when the insect alights upon it its feet become caught. The wings are used as ornaments in some countries, and those which have brilliant tints present in the sunlight a magnificent appearance.

ANIMAL MIMICS.

EVEN the most casual observer must be impressed with the many artifices of delicate and inoffensive animals to escape their enemies. This is illustrated in a marked degree in the squids, from one of which comes the cuttlefish bone of commerce. All this singular family have a chameleonlike power of changing color and adapting it to that of their surroundings; but in one, the

Cranchia, this faculty is developed to a remarkable degree. The animal is not usually over two inches in length; the body is balloon-shaped, the head very small, and the tentacles extremely short. The body is dotted over its entire surface with little points of color, and when the animal is alive it is constantly changing — now being suffused with red, fading suddenly to yellow, an array of tints following one another in quick succession, making it a most interesting object.

A Squid.

That this power serves as a protection there can be but little doubt; when the squid is swimming or poising over sandy bottom its color is white; let the same animal now dart forward by the action of the jet of water from its siphon, and hover over a patch of weed, the spectral form grows darker, soon merging into the prevailing tint of its surroundings, and disappearing from the view of a possible enemy.

In this instance and many others the disguise is not premeditated, the result being the effect of certain colors upon the color-cells.

Many of the simplest animals have remarkable

devices to aid in their protection. Thus, one of the marine worms burrows in the ground, forming a long smooth tunnel several inches into the mud. The entrance of the home is in the form of a chimney, built of delicate pieces of coral and glued together so that a perfect piece of masonry is the result. The entrance at the top of the chimney would easily attract attention, but over this the worm arranges a door, by selecting a bit of marine weed about an inch and a half in length. This it glues to the entrance so that the tip falls over and covers it, having the appearance of being the continuation of a plant. At night this very clever builder and dissembler comes out of its den, lifts the trapdoor, and glides to the surface, where it swims about, making a marvelous display, as it possesses, with others, the power of emitting a vivid light, and gleams in the water like a gem or mimic electric light. Returning, it lifts the cunningly devised door and glides in. So cleverly arranged are these doors, and so marked is the resemblance of the whole nest to a leaf, that the sharpest-eyed collector often passes them by.

The sea anemones which line many a pool — the animal flowers of the sea — frequently cover themselves with stones and shells until they look as though a mosaic had been built upon their sides,

the presence of the gorgeous flowerlike animal being unsuspected.

The instinct to disguise their homes is pronounced among certain spiders. One forms a burrow, covering the hole with a trap-door which opens and shuts with a perfect adjustment. To render concealment perfect, the spider collects small plants and mosses, and deposits them upon the newly formed door until it resembles the immediate surroundings and is lost to view. When the spider ascends and pushes the trap up, the miniature forest upon it is seen to rise into the air in a manner surprising to the observer who does not suspect the cause.

Sea Anemones.

Nature comes to the rescue of a multitude of animals which are practically defenseless, enabling them to assume disguises that are remarkably effective in concealing them from their enemies. This is true of the animals which drift about in the gulf weed that forms the Sargasso Sea. The sargassum, as the weed is called, is supported by

innumerable bubbles, and constitutes the home of many singular creatures — all protected by this device of nature.

The most remarkable mimics are the shell-less mollusks which crawl over the weed. Some are of the exact tint of the sargassum — a delicate olive green; besides which they are covered with tentacles or barbels of flesh which make them perfect mimics of the weed. These interesting creatures cling to the fronds of the gulf weed, and are apparently a portion of it, defying the most active enemies.

Shell-less Mollusk.

Several kinds of fish find equal protection in the weed mass; one in particular, the antennarius, is a very flat fish, about three or four inches in length, which is found lying prone upon the weed so near the surface that it can raise its tail out of the water. Nature has painted this curious little creature the exact tint of the weed, often giving it a marbled color in several shades of green, so that it offers little or no contrast. To supplement this protection, the outline of the fish is apparently distorted in a remarkable

way, cut up into branches and barbels, so that the impression is conveyed that plants or bits of weed are growing upon it. So perfect is this device of nature that, in searching for the fish, I have failed to see it at a distance of but a foot, discovering the dissembler only when it moved or raised its tail.

Myriads of crabs and their allies roam through this floating forest, all masked, following closely the tint or hue of the prevailing weed. Some are dotted with white, thus imitating the white incrusting bryozoans which cover the weed in delicate patches.

So the entire range of pelagic or floating animals might be followed. The purple ianthina or sea snail finds protection in its color on the open sea. The delicate fishes found beneath jellyfishes imitate the tentacular parts of their host in pink and white, while the fishes beneath the physalia are of the same tint as the deadly tentacles.

Equally interesting, suggesting the boundless resources of nature, are the animals which decorate themselves; as the crabs, one of which, commonly called the stone crab, is always found bearing a miniature forest upon its back, becoming in this way, to all intents and purposes, one of the stones among which it lives. That this is not an accident I have ascertained by cleaning the back of one of

these crabs and placing it in an aquarium, where it at once manifested its uneasiness and began to redecorate its back. This was accomplished by snipping off bits of weed with the biting claw, pressing each severed portion to the mouth, where it obtained some glutinous secretion, then raising it over the back and placing it upon the shell, where it remained, and ultimately grew. In two or three hours one of these crabs fairly covered itself with a mimic forest, and seemed gradually to disappear from view among the rocks. The hermit crabs, especially those in deep water, often secure a disguise by permitting a sponge to cover the shell. In one instance I observed, the shell had disappeared entirely beneath a mass of sponge, at one side of which the claws of the crab were seen when it moved along carrying its strange burden. A hermit crab has been found carrying an anemone upon its back which almost concealed it; and in one instance observed the rider was phosphorescent.

Stone Crab.

A DOG'S TRIP AROUND THE WORLD.

A most remarkable dog was once owned by the Postal Service clerks of the United States. Owney, as he was named, appeared at the Albany Post Office several years ago, and was adopted by the clerks. One day Owney boarded the mail wagon, which carried the mail to the trains, and on arriving at the station, leaped from it to the mail car. In it he was carried to New York by the clerk, and after being introduced at the general office, was sent back to Albany.

This trip apparently developed a mania for traveling and resulted in Owney's national reputation as a dog traveler. He made trips all over the United States and Canada, even going to Europe, always under the auspices of the mail clerks, and everywhere he went he received medals, tags, and checks, which accumulated so rapidly that he was finally provided with a harness and a bag. He would leave the mail train at towns and cities and visit the post office, but in a few days, despite the good treatment he received, the mania for wandering would seize him, and he would go to the station and jump into the first mail car that appeared and travel with the clerk until he desired a change. In

this way Owney became well known in almost every city, town, or village that boasted postal facilities.

In 1895 Owney visited Postmaster A. B. Case, of Tacoma, Washington, having just returned from a trip to Alaska, and one day it happened that he rode down to the wharf of the Asiatic steamer when the great vessel was taking her cargo.

Owney was evidently much impressed with her size and beauty, and so plainly expressed a desire to go aboard that it was determined to send him on a flying trip around the world, and to let him break the record if possible. So, some few days later, on August 19, 1895, his friends said farewell to Owney as he walked up the gangway of the good ship *Victoria* of the Northern Pacific Steamship Company, and was welcomed by Captain Panton, whose guest he was to be. Owney had his credentials in a traveling bag, and he carried also his blanket, brush, and comb, his medal harness for full dress, and letters of introduction to the postal authorities of the world. As the steamer backed out from the dock, hundreds of people waved their hands, and wished Owney a safe and prosperous voyage; and so the trip began.

Owney was soon the pet of the crew, and after an uneventful voyage he arrived at Yokohama on October 3. Here his baggage was examined, with

no little curiosity, by the officials, as no dignitary had before entered Japan who owned so many decorations that he was obliged to carry them about with him in a bag! It was concluded that Owney must be either a dog of very high rank, or the property of a distinguished person; and an account of him was promptly forwarded for the information of his imperial majesty, the mikado.

A few days later an official waited upon Owney, and presented him with a passport bearing the seal of the mikado. It was addressed to the American dog traveler, and in very flowery language extended to him the freedom of the interior country. There were some stipulations which, in all probability, Owney would have agreed to had he made the trip. Some were as follows: "The bearer is expressly cautioned to observe in every particular the directions of the Japanese government printed in Japanese characters on the back of the passport, an English translation of which is given herewith; and he is expected and required to conduct himself in an orderly and conciliatory manner toward the Japanese authorities and people." The passport also forbade him to "attend a fire on horseback," warned him not to write "on temples, shrines, or walls," and politely requested him not to "drive too fast on narrow roads."

There was no time for side trips, and, after meeting many officials, Owney sailed from Yokohama, arriving at Kobe on October 9, where he received medals and a new passport from the emperor. He was at Hagi, October 19, Shanghai, October 26, and Fuchau, October 31, where he received more medals and was the subject of an ovation. His fame had preceded him, and at the latter port he was invited to visit the United States steamer *Detroit*, which was lying in the harbor. One day the marine at the gangway of this fine man-of-war was astonished to see a bemedaled shaggy dog come up the ladder, wagging his tail and showing all the delight that a patriotic American should at the sight in foreign lands of the Stars and Stripes. The marine almost laughed as Owney stepped aboard and ran up to

"An official presented him with a passport bearing the seal of the mikado."

the officer of the deck as though he had known him all his life.

Owney dined in the mess room, ate plum-duff and lobscouse before the mast, and — I could not begin to tell you of all the good things he enjoyed. When he reached Tacoma again he weighed several pounds more than when he started, and I am confident that his trip with the boys in blue on the cruiser *Detroit* had something to do with it. When he bade his countrymen farewell, he was decorated with the ship's ribbon, and he received a letter of introduction to other officers of the Asiatic squadron from Lieutenant-Commander E. Floyd of the *Detroit.*

From Fuchau the dog sailed to Hongkong, where he was unfortunately delayed and prevented from making a speed record around the world. He visited the consulate, made a round of visits to the rich tea and silk merchants, and received many curious pieces of Chinese money, which were strung to his collar. From the Emperor of China Owney received a passport bearing the royal crest and dragon, permitting him to travel in the country. But Owney did not go beyond the city, and so much red tape was employed on his departure by the Peninsular and Oriental steamer that Captain Panton of the *Victoria* finally decided to take the

dog traveler back to Kobe, Japan, from which port he finally sailed to New York as the guest of Captain Grant, of the steamer *Port Phillip*.

Owney soon knew all on board, and, as on the *Victoria*, was a member of both starboard and port watches, and dined in the cabin and before the mast with equal satisfaction.

At Singapore, Owney went ashore with an officer, to the wonderment of the natives, who, noting his decorations, concluded that he was a personage of high rank. Some of the native dogs, it is said, looked upon him with distrust, and more than once they rushed out from narrow alleys and pounced upon the Yankee dog; but it is not on record that Owney was ever defeated. On November 30, Owney sailed from Port Said, where he put to flight more native dogs, and on the trip through the Suez Canal he attracted no little attention from the various vessels and from postal authorities. Many of the clerks gave Owney some memento.

Finally Algiers was reached, and the quaint shipping port visited, where Turks, Nubians, and others looked upon Owney with amazement. They handled his decorations, and some, though perhaps they did not understand just why, fastened to his collar medals which were thus sent to the American

people. On December 13, Owney reached St. Michaels, the beautiful port of the Azores, spending a few hours there.

The trip from the Azores across the Atlantic was a rough one; but there was no evidence to show that Owney did not thrive in all kinds of weather. Finally the lookout of the *Port Phillip* sighted land, and a few hours later Owney's baggage was being examined by the custom house officers, who had never seen so strange an assortment of trophies. But having looked at his credentials, they decided that the collection of medals and tags, though representing a large amount of metal, was personal baggage, and so passed it.

Like all distinguished persons, Owney was met by the reporters and "interviewed," and from the bag of decorations and letters his story was probably obtained, and the news of his arrival telegraphed to Tacoma papers as follows:

"Owney, the postal clerks' dog, has arrived at quarantine from China, having completed the circuit of the globe. The steamer will dock to-day, and Captain Grant will take the dog to the post office, and start him on his journey westward at once."

As may be expected, this announcement created no little interest among the young people of Tacoma, and Owney was the hero of the hour.

Owney arrived in New York December 23, at noon. He was taken immediately to the post office, and, after a short reception by his many friends, started again by the New York Central for Tacoma, which he reached five days later, having completed the circuit of the globe in 132 days — a rapid rate of traveling for a dog who attracted so much attention. Owney was visited by hundreds, young and old, and so universal was the demand to see him that Postmaster Case placed him on exhibition in a public hall, and people, for miles around, made his acquaintance.

At the end of his trip Owney had over two hundred tags, medals, and certificates to add to his collection.

FLYING WITHOUT WINGS.

One of the most interesting sights observed in southern California waters is a flock of flying fishes in the air; not one or two, but often forty or fifty, ten feet or more from the water, lifted by the wind and whirling away like quail or a cloud of insects, scintillating in the sunlight — a startling picture. The fish appear to be flying, but they are simply one variety of many animals which apparently fly without wings. I have had these fliers pass within a foot of my face, and have known several persons who have been struck by them; but while the fishes dash through the air and cover distances of an eighth of a mile out of water, they are not strictly fliers, as they have little or no power to move the wings, as in legitimate flight. The wings are merely enormously developed fins, the pectorals resembling wings, with powerful branches or veins, the anals being smaller. The fish, then, has not four wings in the strict acceptation of the word, but four winglike fins which it holds firmly, and which serve as sails or parachutes, bearing it up against the current of air as it rushes along. In this way these fish soar for long distances.

In the Gulf of Mexico there is a fish known as

the flying gurnard, which bounds into the air when alarmed, spreading its wide pectoral fins, darting away like some gorgeous insect. It has vivid colors of blue, purple, and red, while its large winglike fins sparkle and gleam in the sun as though they were inlaid with gems. This flier possesses a singular armor, its head being incased in bone, so that a blow from the fish in its headlong flight through the air is liable to result seriously. There are instances recorded of men being knocked down and stunned by them.

Flying Gurnard.

Certain fishes have the faculty of propelling themselves into and through the air in other ways. Such is the large gar of the South Pacific, which, when alarmed, bounds from the water by a twist of its tail and goes whizzing away, a living arrow and a dangerous one. When the ship *Challenger* made her famous trip around the world, the naturalists on board had many opportunities to observe this flier without wings. One struck the cap of an officer, and instances came to the notice of the naturalists of fishes which had struck natives who were wading in the water.

The most perfect fliers without wings are found among the mammals and reptiles. One of the lizards has a peculiar frill connecting its limbs; this frill is braced by a series of false ribs. When the lizard wishes to escape from some enemy, it darts into the air and soars away downward, upheld for a long distance by the side wings, which are boomed out by the false ribs. The little animal now resembles a large dragon fly, its rich metallic colors flashing in the sunlight. On it rushes, making a graceful curve, rising and grasping the trunk of a tree when it seems to disappear, so marvelous is the protective resemblance. If still followed by some bird enemy, it will repeat the action, continually dipping down and rising, ultimately escaping.

The flying squirrel well illustrates this curious faculty of soaring like a bird. Its fore and hind limbs are connected by a web of flesh which hangs in a wrinkle when the animal is at rest, and would not be noticed; but the moment the little creature darts into the air and moves away the white parachutelike arrangement is seen. It catches the wind or rushing air as the squirrel bears down, and seems to expand and extend outward, bearing the little flier safely on, enabling it to cross from tree to tree and reach other points of vantage.

The flying lemur is one of the largest and most re-

markable examples of this provision of nature. Here not only are the limbs connected by a web, but the tail and hind legs are booms for fleshy, fur-lined sails, so that the lemur, with its young clinging to it, leaps boldly into the air, swooping down with great velocity, rising again to grasp a branch or trunk, to climb to the topmost bough and launch itself again into space. In this way the lemur will, if followed persistently, cover miles in a forest, and, as a rule, escape its enemies. The graceful ease with which they make these long flights is remarkable. The animal has but to extend its limbs, as one intuitively does in diving or swimming, and plunge down into space.

Flying Lemurs.

The islands of Sumatra and Borneo have produced some remarkable fliers of this kind. A party of explorers, in passing through a forest one day,

saw what they supposed to be a bird swooping down from a limb. A native was sent in pursuit of it, but the creature rose at the end of its flight and alighted upon a tree, up which it seemed to crawl, then flung itself into the air again. It was finally captured, and proved to be a large tree toad. Instead of wings it had large elastic webs between its toes, which caught the air as it dashed away, buoying it up and acting as parachutes. The feet of the animal resembled those of a gull or a duck, so far as the webs were concerned, the four little parachutes offering surface sufficient to bear up the animal from tree to tree.

A spider with a diminutive flying or soaring apparatus has been discovered. On each side of the abdomen extends a triangular lobe which catches the wind when the spider leaps into the air, aiding its flight to some extent, and well illustrating this remarkable method of flying without wings.

THE DRAGON THAT SWALLOWED THE MOON.

THERE was unusual excitement at the great mission of San Juan Capistrano, and for several days natives had been pouring in from the outlying country. A fiesta had been announced by the Spanish troops, an ox was roasting in a huge

trench, and one night, by the light of the full moon, a fight between a bear and a bull was to take place —an event which was looked forward to with interest, not only by the natives but by the Spanish soldiers.

It was still early in the afternoon, yet the tiled roofs of the old mission were crowded with spectators who had come early to secure good seats and had covered the tiles with dry hides upon which to rest. The long line of arches, the picturesque belfry, the shapely dome of the church, all caught the red rays of the setting sun and formed a charming picture, while away from the mission on every side extended green hills and fields of fragrant flowers, telling of the winter in southern California. On the cement walk in front of the mission stood a group of Spanish officers, and among them a young boy with long golden hair, a wide-brimmed sombrero, and enormous spurs, after the fashion of the time.

"It's a cruel and brutal sport," he said, "and if I were you, captain, I would stop it."

"I quite agree with you, my boy," replied the officer, smiling; "but it would be very poor policy to attempt to interfere with the sport, especially as we are so short of men. We are obliged to do something for the pleasure of the people, brutal as it is."

"But if you gave the order, captain, they wouldn't dare to go on," continued the boy.

Here the officer was called away, and the major-domo, a big, red-faced Spaniard, turning to the

"Don Antonio soon reached the large hut of the chief."

boy, said: "Listen, Don Antonio; do you really wish to break up the bull-and-bear fight?"

"Why, certainly I do."

"Then," said the major-domo, "do as I tell you;" and he whispered something in the boy's ear that made him laugh heartily. He then ran to his pony, which an Indian had been holding, leaped

upon its back, and rode away in the direction of the tule huts of the Indians, down by the little river.

Don Antonio, as the man called him, soon reached the large hut of the chief, whom he found lying under a ramada of brush eating grapes, while near at hand the women crushed acorns in mortars of stone.

The chief handed him a bunch of grapes, and motioned him to take a seat on the hide; but the boy would not sit down, and said in Spanish: "You are going to have the bull-and-bear fight to-night, Captain Joe?"

"Yes," replied the Indian, in the same language. "You come?"

"No," said Don Antonio, "it's too cruel; it isn't right; it hurts the bear."

The chief looked amazed at first, then laughed, translating the boy's remark for the benefit of the squaws, who joined in the merriment.

"There will be no fight to-night," said Don Antonio, with a great deal of dignity.

"Why no?" asked the Indian.

"Because," said the boy, swinging into his saddle, "there will be no moon."

"Very big moon to-night," said the Indian, "best moon of all the month."

"Captain Joe," said the boy, very seriously, "did you ever see the dragon that chases the moon?"

"I hear my father speak of him," replied the Indian.

"Well, he is going to catch the moon to-night," said the boy, as he touched his spurs to his horse and rode away.

The sun sank over the hills, and the old buildings of mud and adobe became radiant in its parting light; groups of Indians and soldiers were moving in the direction of the inclosure, many dragging hides to sit on; and finally, when the moon began to rise, the great arena was crowded with dusky forms eager for the fray.

Amid shouts and cries a large and ugly bull was pushed from a corral into the ring, then a big box was hauled in and the end pulled up, releasing a grizzly bear which had been roped in the mountains the week before and dragged down to the mission.

Excitement was aroused to the highest pitch, and a hush had fallen over the assemblage, when there rose a shrill voice, crying loudly in Spanish, so that all heard: "The dragon has caught the moon;" then louder like an echo: "The dragon is swallowing the moon."

Every eye was raised to the heavens, and, to the

surprise of the assembled natives, there was a decided notch in the face of the full moon. As they looked, it grew larger and larger, while a strange, mysterious light began to steal over everything. At first there was a low murmur from the natives; then, as the spot grew larger and the moon was evidently disappearing before their eyes, the great audience rose, and shouts and cries rent the air. The men who had brought hides held them aloft and beat them with clubs, shrieking an accompaniment, while the women joined in a weird moaning. Men upon the ground threw sand at the moon, pelted it with stones, hoping in this way to drive the dragon away; but as the moon grew smaller and smaller, they were seized with a panic and ran out of the quadrangle, and hid themselves in their tule huts or the deep brush on the river side, where they remained until the moon appeared again, when they slowly ventured out and gathered about the roasted ox, wondering that the world had not come to an end, as the dragon had surely swallowed the moon.

"There is only one man in the post," said the captain to a group of officers, "who is sufficiently well posted in astronomy to know that a total eclipse of the moon was due to-night; and Captain Joe tells me that Don Antonio is a remarkable

'medicine,' as he foretold the appearance of the dragon."

"There is a curious feature about this legend," said the major-domo, who was sitting in the corner with Don Antonio standing by him, and who, laughing, seemed desirous of changing the subject. "The Chinese have a similar belief. They too have a dragon which is ever chasing the moon, sometimes catching it; in fact, the eclipse is their dragon. Now, if these Indians have the same belief, and try to frighten the dragon away in the same manner, does it not suggest that the Indians of the Pacific coast may have been descended from a remote Chinese ancestor who was blown away from China and wrecked with his junk on these shores ages ago?"

"What say you, Don Antonio?" said the captain. "Surely you have an opinion on this subject."

"I don't know anything about that," replied the boy; "but I do know the Indians made so much noise with their hides and sand-throwing that they stampeded the bear and bull, and they cannot be found!"

HOW ANIMALS TALK.

My interest in the language of the lower animals was perhaps first aroused by a vocal appeal which

a fish made to me in the Gulf of Mexico. I was fishing on the edge of a coral reef, where the rich olive of the coral heads gradually gave way to the blue waters of the channel, when I hooked and brought up a fish about eight inches in length, of an old-gold color, marked with scarlet lines and spots — a most attractive little creature. As I took it in my hand to remove the hook, I was attracted by its eyes, which were lustrous, with yellow and red tints, but especially as they seemed to roll up at me in a supplicating way. Then it began to talk to me, after the fashion of its kind, uttering at first a plaintive grunt, then a series of croaks which seemed to rise in inflection, then die gradually away. Then it would croak, almost bark, until finally I tossed the fish back into its native element, fairly conquered by the sounds it uttered. The little fish was a member of a large family (*Hæmulon*) in that vicinity, nearly all of whom were grunters or croakers, and remarkable for the variety of sounds they produced.

A large number of fishes utter sounds. I have heard the common dogfish utter a curious sound that has been construed into a bark. The eel makes a low, croaking noise, said to be musical. The little sea horse utters a single note so far as known, while the gizzard shad is a "talker;" but none of these equal the little hæmulon that grunted and barked its way to liberty in the Mexican Gulf.

The sounds made by fishes are uttered in various ways, and many, I think, are involuntary. Some are produced by the action of the pneumatic duct and swimming bladder, while in other fishes the lips and intermaxillary bones have something to do with the sound. In certain fishes, as *Zeus* and *Trigla*, there is a low, murmuring sound produced by the swimming bladder, which has an opening and closing diaphragm. The catfish utters sounds by forcing air from the swimming bladder into the esophagus. In the sea horse referred to, the note is produced by the vibrations of small voluntary muscles.

The loudest sound-producer is the drumfish, which in some way utters drumming notes that have startled seafarers off the New Jersey coast. In China, on one occasion, a sound was heard by the officers and crew of an English man-of-war, coming up from the water like the twanging of a

great harp, and was referred by some to a school of fishes and by others to certain shells.

I believe nearly all animals have a language or method of communication, though not always vocal. The sensory organs of fishes are well developed, and they can track one another by scent when out of sight. In the deep sea the phosphorescent lights of fishes are signals which may have some significance in communication. Some fishes have two or more lights of different colors, like a steamboat or ship. This is true of the *Malacosteus niger*. On one side it has a golden light; on the other the light is green.

The ordinary domestic fowl affords the most positive evidence of the possession of a language that is understood. There are many decidedly different calls, which, if taken down in a phonograph and repeated in a henhouse or yard, would produce interesting results. I need but mention a few calls to illustrate the range of the sounds in the domestic fowl. On a warm day, when hens are released from their coop, when their minds are undisturbed and all nature looks bright and inviting, they sing as they feed — a continuous repetition of "kerr-kerr-kerr," with various modulations. The rooster never utters it, nor the mother hen. It is the song of the happy-go-lucky hen.

Now let a hawk appear in the sky. An entirely different sound is heard. The hen stops, stretches her head upward, and, with the cock, utters a decided note of warning in a high falsetto—"K-a-r-r-r-r-e!" And if the enemy still comes on, it is repeated, and every bird in the vicinity lowers its head and runs to cover. The sound says in the hen language: "An enemy is coming! Run!" And run they do, the "k-a-r-r-r-r-e" being discontinued only when all danger is past. Note the joyous call of the hen that has laid an egg. "Cut-cut ca-da-cut!" comes oft repeated from the henhouse, and other envious hens are informed beyond any question or mistake that Mrs. Gallus has laid an egg.

Now, when these eggs are hatched we have other and maternal notes. There is a deep, monotonous "cluck-cluck!" That is a warning to others and a gentle admonition to the chicks to remain near, but it is not a call. Note the difference when the mother or the proud cock finds a worm. The cock appears to be greatly excited, and he pretends to peck at it, making the guileless hens believe that he is about to devour the *bonne bouche* himself; all the time he is saying "Cut, cut, cut" — "Come, come, come"— rapidly, which causes the hens to run pellmell in his direction, to find, in many instances, nothing, it being merely a device to call the flock

away from some rival. But in the case of the mother the little ones always find some tidbit which she has discovered.

I will not attempt to reproduce the baby talk of the old hen to her chicks, but it exists in great variety, and is suggestive of tenderness, affection, and solicitude. When the hen has her brood beneath her ample folds she often utters a sound like "C-r-a-w-z-z-e," of half warning and contentment. And when an intruder enters the coop after dark she utters a high, prolonged whistling note like "W-h-o-o-o-e," softly repeated, indicative of wonder and slight alarm.

If now a fox, coyote, or other enemy seize her, how quickly comes an entirely different cry — a scream of terror and alarm, "C-r-a-i-a-i-o-u," repeated again and again, and so full of meaning that the owner, some distance away, reaches for his shotgun and answers the signal of distress.

Among the song birds there are many such notes.

Especially have I noticed it in a family of mocking birds that have nested in a peach tree not far from my window. The cry of alarm given by the mother when I took out one of the nestlings was a loud sucking, clucking note, that brought not only the mate, but an entire flock of blackbirds that frequented an adjoining orange grove, all gathering around me, uttering loud and discordant notes, menacing me from every point of vantage, and suggesting that the mocking bird dialect of the peach tree was understood by the blackbirds of the orange grove tribe.

Undoubtedly all birds have a more or less well-defined means of communication, though differing. A pelican hissed in asthmatic tones at me. My owls had a limited and hissing vocabulary, but looked volumes through their expressive eyes. The humming bird has a dainty song and delicate notes which I hear among the nasturtiums—"Chit, chit, chit," and other notes; and the purring love note of the pigeon is well known.

Among the higher animals there is often a range of sound that does duty as a language. The cats have a wide range, from the plaintive call for admittance to the purr of content and the snarl of rage and its varied modifications.

The whale has a voice, if we may believe the old

writers. One is called the "caaing" whale, from its alleged voice, and no less a naturalist than Lacépède quotes Duhamel as an authority regarding the rorqual, and "the lamentable and terrible cries" it was supposed to utter.

The dogs combine with voice, movements of the hair, tail, eyes, and ears in speaking. The low growl is accompanied with rigidity of the body, the canine teeth gleam brightly as a warning, and the entire appearance speaks of rage. How opposite is its appearance when greeting its master and fawning at his feet.

The snake can hardly be said to possess language, but that it can call its young has been demonstrated. Colonel Nicholas Pike, a former consul to Mauritius, told me that he had heard a garter snake call its young as he approached by a "peculiar noise," at which they wriggled toward her and ran down her throat for safety — a common trick among various snakes, despite vigorous statements to the contrary. Colonel Pike observed this on several occasions; so it is evident the mother snake has a vocal call that is understood by its young.

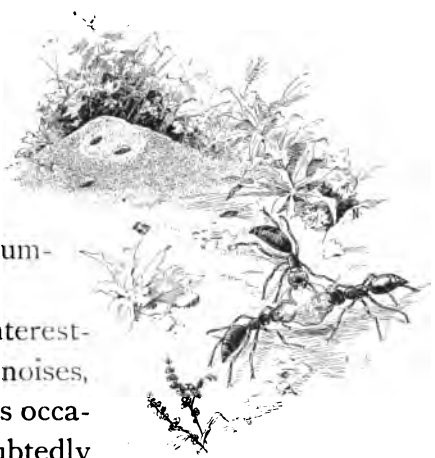
Who can doubt that the strange noises made by insects have not some meaning understood by them — the song of the locust, the shrill note of

the katydid, and the chirp of the cricket. These sounds are not vocal, but instrumental. The grasshopper fiddles to his mate, and the cricket stridulates his song, while the locust drums. The noise of the grasshopper is made by rubbing the thighs against the fore wing. The former is serrated for the purpose, and under the glass resembles a saw. In the locusts the base of the anterior wing is transparent, forming a drum with which the males do their talking, the various species uttering different sounds, which, it is said, differ day and night. When the katydid utters its call the lips are silent, but there is a vigorous rubbing of the inner surface of the hind legs against the outer surface of the front wings, while the male cricket elevates its fore wing and rubs it against the hind pair.

What a fiddling and chirping there is on summer nights, or drumming on the warm days when the cicada and its friends come out. If these are not calls, sounds with meaning, then nature has for once provided something useless.

Some of the butterflies utter a clicking sound. Beetles have remarkable odors by which they distinguish one another, and no one can watch ants without being convinced that they have a means of communication known only to themselves. I have provided an ant with food too large to be carried

off, when it would return to its home and soon appear with two others, and the trio would remove it. Did not the ant tell its good fortune and ask for aid? Ants are often seen facing one another in close proximity and touching one another with their antennæ, presumably exchanging ideas.



"The trio would remove it."

The elephant has an interesting series of sounds or noises, which it utters on various occasions, and which undoubtedly constitute its language. I was impressed with this when attending a private view of Jumbo given to a number of professional men in New York, when the keeper made the huge animal exercise his voice. A shrill cry, uttered through the trunk, indicated rage. An elephant has been heard to warn another elephant by a low sound resembling "prut," or a gentle twittering, while wild elephants utter a sound like hammering on a cask. When the keeper prodded Jumbo, or touched him with the goad, the great beast uttered a penetrating squeak, which seemed to be made inside the trunk, and was ear-piercing. He showed his pleasure by

low purring, like a cat, the sound being audible to the driver alone. Rage was expressed by a rumbling in the throat, and fear by a reverberating roar. Suspicion is often shown among wild elephants by a tapping upon the ground, and there are various other sounds and signals which show that the elephant has a language of its own.

Certain shells utter singular sounds, accidental, perhaps, but in some instances so sharp that they attract widespread attention. Some travelers were passing from the promontory of Salsette to Sewree, in Bombay, when they were amazed at hearing a long-protracted booming sound like the notes of a gigantic harp, or a pitch pipe. At first it was believed to come from the shore, and some of the party were convinced that some one was playing upon a musical instrument; but stopping the boat, they found that it was coming from all around them, and was supposed to proceed from a little shell common in the vicinity.

It may be assumed that nearly all animals have a language of sound, sign, or odor which serves them well.

ANIMAL MOUND BUILDERS.

SOME years ago a sea captain who was trading in the Celebes Islands received, as he was about

to sail, a basket which the messenger said contained a few eggs which he wished delivered to a naturalist at the next port. The skipper placed the eggs in his cabin for safety, and thought no more about them until one morning he heard a noise in the basket, and, to his amazement, saw one of the eggs break open and its occupant fly across the cabin.

Later he learned that the bird was the maleo, a pheasantlike creature that deposits its eggs in the volcanic sands of the beach, allowing the sun to hatch them. The young birds dig their way out, and are able to take care of themselves from birth, and can fly immediately to a limited distance.

Closely related to the maleo is a group of birds which can be very properly termed the mound builders of bird life. They are the megapodes of New Guinea and Australia, birds that use incubators to hatch their eggs. There are a number of species, but in general they resemble small turkeys with very large feet, and are found in the brush near the shore or beach.

When the breeding season arrives, both sexes select a suitable place and proceed to build a mound of grass and vegetable matter. This is accomplished by the birds taking the material in their large and powerful claws and hurling it backward. A large mound is the result, which, when

used year after year, often assumes striking proportions.

As an example, some naturalists who were traveling on the Island of Nogo, in Endeavor Straits, were attracted by the accounts of the natives of a bird that made mountains in which to hide its eggs from enemies. On offering to reward the natives, the travelers were taken to the mound of a megapode, from which the guides triumphantly dug out several eggs. The mound was, if not a mountain, a small hill, and measured one hundred and fifty feet in circumference, and at one end was fourteen feet in height, sloping in one place twenty-four feet to the level of the ground, which was scraped bare in the vicinity. Another observed was twenty-five feet in length and five feet high.

These mounds are formed of vegetable matter, interspersed here and there with fine gravel, decayed wood, and leaves, and are artificial incubators. The birds dig a hole in the top, and deposit the eggs about six feet from the surface; the eggs are then covered up and left to hatch by the heat generated in the mass, whereupon the young scramble out.

The Nicobar megapode constructs a similar mound, while the talegallus of Australia is equally remarkable as a mound builder. In this instance, several females use the same nest, and as many as

a basketful of eggs have been taken from a single mound. This bird is nearly as large as a turkey, and resembles it.

Among the birds there are a number of mound builders. The lyre bird, so remarkable for its ventriloquistic powers, forms a singular mound of sticks and brush. Upon one occasion, several naturalists visited the small islands on the Bahama Banks, and came upon a singular settlement of mounds. The latter were about thirty inches across, and from one to three feet high, and resembled stools or seats rising from the mud. They were the moundlike nests of the flamingo.

Lyre Bird.

A little bird found deep in the heart of Borneo, called the gardener bird, erects an apparently perfect mound, three or four feet high, which, wonderful to relate, is hollow. The bird is but little larger than a robin, and builds this mound of green twigs simply as a

pleasure house, its eggs being deposited in a nest not far distant.

In traveling over the prairies of Illinois several years ago, I observed singular mounds here and there in what was comparatively dry land. So numerous were they that they made the surrounding country appear as though billows were passing over it, giving it an undulating surface. Upon investigation I found that the mound builders were little crayfish that penetrated the soil in every direction from the neighboring brooks, the mounds being startling evidences of their industry.

Very remarkable are the moundlike structures of lamprey eels. One observed in the Saco River was fifteen feet in length and three feet in height, and was formed of stones. In removing the stones the eels attached their suckerlike mouths to them, and, rising with a wriggling motion from the bottom, allowed the current of the stream to carry them along as far as it would before they dropped; then the upward wriggling motion was repeated, until finally the stone was placed where desired. Among the material carried downstream in this manner was a portion of a brick that took the united efforts of two large eels, which held themselves upright in the water as they were carried on by the current.

In my walks and drives through the foothill

country of southern California, I have frequently seen a curious and interesting mound builder. The first mound that attracted my attention was a mass of brush piled up about the trunk of a small tree, standing perhaps three feet from the ground. It was so interwoven and interlaced that only with difficulty could I pull it apart, the short twigs having in some way been wound in and out so closely that the heap was not only an impregnable fortress, but rain- and weatherproof.

Not knowing exactly to what member of the animal kingdom the mound belonged, I retired a few feet, and soon saw the owner — a large, lustrous-eyed wood rat, that watched me sharply from its point of vantage, at the slightest movement dodging back. I had never seen an interior described, so I began to demolish the nest, and labored long and hard before I had laid it open.

Wood Rat and Nest.

The upper portion contained a room or apartment lined with fine moss and the bark of trees, and thoroughly protected from the rain. There

were other apartments or rooms, some stuffed with seeds, corncobs, and pieces of cloth, probably picked up in the vicinity of a neighboring ranch house. The whole mass was honeycombed with tunnels, so that it was an impossibility to catch one of the mound builders napping; and when I finally removed the nest, I found that one of the passages led into the ground and radiated in various directions.

Several species of these interesting little creatures are known, some living in Florida, where I have seen them among the palmetto leaves.

Many of the insects can be termed mound builders, forming heaps of clay and earth, and in various branches of the animal kingdom we find these curious resemblances to the work of the human mound builders.

THE HOME OF A FISH.

Once, while leading his regiment on a long march through the Indian country, General Custer, who was at the head of the column, made a slight detour of a few feet, the long line of horses and men of course following suit.

A movement that was apparently without reason attracted the attention of the soldiers, who, when

they came to the spot indicated by the change in the line, looked around in search of the cause. It was only the nest of a meadow lark, containing several little half-feathered birds, and, if I am not mistaken, every man, as he marched by and glanced down at the nest, received an impressive and enduring lesson in humanity. We are, as a rule, too lawless in our dealings with the lower animals, and it is a good plan to assume that they know very much more than we give them credit for, and suffer proportionately.

Very little is known about the home life of fishes. Some are migratory,—wanderers in the bed of the ocean,—as the mackerel, dogfish, and the allies of the former, constituting the Arabs of the sea, or resembling the people who go South in the winter, returning to their homes in summer. In tropical waters fishes live in certain areas to a great extent, and I have seen the same ones about a certain wreck for years. They are very much influenced by the weather. When it is rough and the surface is ruffled by the wind they lie low near the bottom; but when the wind dies away and the water is as clear as glass, they rise to the surface to bask in the sunshine, often leaping from the water, showing delight in a bright, beautiful day as we do.

Fishes make their homes in various localities.

Thus I have known some to live between two piles of an old wharf, where they could always be seen except during pilgrimages for food. Others lived in a bunch of coral, another family in a coral head, some under a certain clump of seaweed, and from these points they rarely strayed to any great distance.

Some of the fishes not only have restricted areas in which to live, but form nests quite as complicated as those of some birds. Perhaps the most familiar example is the stickleback — the curious spiny little guardian of many of our shores. There are a number of kinds of sticklebacks, and nearly all of them are nest builders.

A familiar one is the four-spined variety of this country. Strange to relate, the mother fish takes very little interest in the home, the male being the builder. The nest is placed in various positions; sometimes it is on the bottom, again it hangs pendent from some twig — a marine hammock — or is fastened in the crotch of a submerged branch. The nest is formed of the refuse of the bottom; shreds of weed, bits of material of all kinds that are soft and pliable and can be easily molded into the required shape. If the home is to be suspended, the first timbers, if so we may term them, are hung across a limb and then wound in and out as deftly

as a bird would do, until finally we see a collection of material oval in shape and half as large as a tennis ball, but very often much smaller.

But how is it held together? If we had watched the little builder carefully we should have seen that, during the building process, the fish apparently rubbed itself against the sides of the nest every minute or two, often passing entirely around it; and if we were able at this time to examine it, we should see, stretching from point to point, a delicate thread, apparently of silk. These cords bind the nest together, and are taken from a little pore on the under surface of the fish, which explains the movements of the little builder in pressing against the nest. When all is complete we have what a ball of yarn might resemble after it had been in the water for months. Now comes the final work. The home has been built and the inside left until the last. The fish, which is shaped like a wedge, dives at the nest, butt-

Stickleback's Nest.

ing and striking with its bodkinlike little body, finally by mere force of strength pushing its way through the nest, converting it from a bunch of refuse into an object which might be compared to a napkin ring, having a door or opening entirely through it. Finally the female deposits the eggs, which are held in place by the weed, and in due time the young sticklebacks appear. The mother deserts the nest as soon as the eggs are deposited, and the entire duty devolves upon the father, who now mounts guard with a ferocious air, and makes onslaughts upon all who venture near. His favorite position is in the nest, his head projecting from one side and his tail from the other. Here he poises, and with his fins keeps a current of water flowing over the eggs, thus preventing the growth of fungus upon them. As the little fishes appear, the efforts of the parent are redoubled, and I have observed one draw several little wanderers into his mouth and shoot them violently back into the nest. But like other little ones, they are prone to stray from home, and some defy the vigilance of the guardian, and the nest is soon deserted.

Some fishes have a floating home, one of the most interesting being the paradise fish of Asiatic streams. In appearance the fish is a most fantastic creature with long top and bottom fins, resembling

plumes more than fins, and calling to mind the so-called angel fishes of the tropical waters.

I once observed a paradise fish in the act of making its nest. My attention was first attracted by its movements. It was evidently laboring under some extraordinary excitement, swimming rapidly to and fro, and when passing its companion in the tank opening its gill covers so widely that the red gills were visible. Finally the little creature rose to the surface, and with an audible sound inhaled air, then sank again, and allowed the air to escape in bubbles that rose upward and retained their place. The act of inhaling air was repeated until the bubbles accumulated to such an extent that in half an hour they formed a raft, somewhat resembling that of the beautiful marine snail, ianthina, and almost as large as a silver half-dollar.

Nest of the Paradise Fish.

This was the nest of the paradise fish, in many instances made thicker and larger, each bubble be-

ing a buoy enveloped in a mucous envelope taken from the fish's mouth.

Amid the bubbles of this gleaming raft the eggs are deposited and held until the young are hatched, the soft portions of their home forming their first food. Such a nest adrift upon the waters can hardly be called a home in our acceptation of the term, yet it is the home of hundreds of little paradise fishes.

Another floating nest which it has been my good fortune to see is that of the little fish antennarius, a long name given to a very short and peculiar fish that lives in the Sargasso Sea, in the Gulf Stream, and almost invariably floats with the sargassum or weed at the surface.

The nest of the antennarius is sargassum, collected and bound up into a ball, sometimes as large as a Dutch cheese. The fronds and leaves are held together just as in the case of the stickleback's nest, the fish taking a secretion from its body, which appears to harden on contact with the water, and constitutes strong bands. The eggs are not placed in the nest, but are fastened to the various parts, resembling little white shot all over the surface. When the young appear they find protection in the ball, and their first food is found on the delicate plants and animals that grow there. I have found

these little wanderers in the Gulf Stream off Cuba in great numbers, every large patch of floating weed repaying a visit, and producing not only the fish, but a large variety of animal forms, all protected by their wonderful resemblance to the weed.

That a fish could build a nest sufficiently large to stop a boat would seem incredible; yet when rowing along in a little bay among the Thousand Islands, my boat grounded upon such a nest, that had been built up from the bottom to within less than a foot of the surface.

The nest belonged to the chub, and was made of small stones and pebbles brought one by one from the surrounding bottom and heaped up. Thousands of pieces were used in some of these nests, which were five or six feet across, three or four feet in height, and must have weighed over half a ton. The nest is a stone castle, to some extent conical in form, and on its surface the eggs of not one, but several of the fish, are dropped, finding protection in the crevices from the catfish and other kidnapers and egg eaters of the river. Here the young are hatched, finding security until they are large enough to stray away.

The large size of these nests shows that they are the work of years, and are continually used season after season. I searched the bottom for many feet

around some of them, but no pebbles were to be found, showing that the little builders had brought their material from some distance, and probably added to it year after year.

DIPODOMYS.

The home of Dipodomys was on the slope of the Sierra Madre Mountains, where they reach up from the San Gabriel Valley, and a more beautiful place could hardly be imagined.

It was in the month of February, and not a mile away, on the mountains, great banks of snow gleamed brightly in the sunlight, and the tops of huge firs could be seen bowed with snow; yet

about the home of Dipodomys, which was a burrow in the ground, there spread away a wealth of flowers of such intense golden hue that it was said in former days the sailors who saw it from far away on the ocean called the spot the "land of fire." The color came from the wild poppy, which fairly covered the fields, winding away in great rivers of gold — a strange contrast to the snow-banks so near at hand.

The home of Dipodomys was just beneath a cluster or clump of these brilliant poppies, and as he lay, perhaps half asleep, the bees and butterflies fluttered and buzzed about his door, and richly colored beetles climbed into the poppies late in the afternoon to be shut up for the night.

The story of these days was in the main lost to Dipodomys, as he rarely ventured forth between sunrise and sunset. It was when the great shadows came creeping out of the canyons, and the mountains were lost in the purple haze, that his fierce, be-whiskered face would appear at the mouth of his burrow, and with a leap he would bound into the field of flowers.

It was at such a time that Dipodomys and his future owner met. Something jumped into the air, again and again, and by rare good fortune fell upon a patch of sand, where it was caught with-

out difficulty, and, proving to be Dipodomys, was carried into the house and examined by many curious eyes.

Imagine a kangaroo about seven inches in length, with a head more like a squirrel's; great lustrous eyes admirably adapted for seeing at night; a long tail, heavily bushed at its end; a trim little creature, of a pale yellowish-brown hue above and white below; an animal that could stand on its hind legs and tail and walk about to a limited extent. Imagine such a creature, and you have Dipodomys as he was found among the poppy beds.

At first the new pet was wild, and made vigorous attempts at escape from the little room that was his prison, but finally a companion was trapped, and the pair became very tame and a source of never-ending pleasure.

It was soon discovered that Dipodomys was a seed eater, and that he had two little storehouses for grain, which he carried about. These were fur-lined pouches, and were on the outside of the mouth, one on each side. When Dipodomys found a supply of food his first object was to fill the pouches for a future meal. This he accomplished by using his handlike paws and tossing the seeds into the pouches — a feat performed with remark-

able celerity: so rapidly, in fact, that the eye could not follow his movements.

The interesting pair slept in a little box, but had the run of a small room, and soon became quite fearless. Their motions reminded one of the kangaroo, as the long hind legs were used to propel them in their leaps. The tail was an important member, being employed with the legs as a tripod upon which they kept themselves upright.

One day while their owner sat watching them hop about, there evidently arose a difference of opinion, and to his amazement both little hoppers rose to their feet and stood upright upon the very tips of their toes, the tail touching the floor and serving as a rest. For a few moments they eyed each other very sharply, moving forward and back; then a mimic boxing match began, the two facing combatants striking each other very much as boys are prone to do, and so rapidly that only the soft sound of the blows could be heard. They did not attempt to use their teeth, and certainly little harm was done with their paws.

"Then a boxing match began."

Standing so erect, their handlike paws flying, their enormous mustaches vibrating, they presented a most ludicrous appearance.

The breach was soon made up, for their owner provided them with seeds, and the two began to fill their pouches. When the latter were full they would hop over to some dark corner and empty them, then hurry back with an air of perfect innocence regarding any previous supply.

To test the speed of the little creatures one was released on a sandy flat. It immediately bent down, touching the tips of its slender fore paws to the ground, then sprang forward, clearing at least three feet and a half; then another spring and another, moving so rapidly that it was with difficulty its owner caught up with it.

When these little animals slept, the head was dropped so that the nose touched the ground, and, coiled up as round as a ball, they would sleep away half the time.

Dipodomys was one of several species very similar in general appearance found in the Southwest. In some localities they are called pocket mice or rats, in others kangaroo rats; in the first instance because of the curious hair-lined external pockets which they have, and in the second on account of their jumping powers.

The near relations of the family are equally interesting, and are famous jumpers. One, the zapus, looks very much like a mouse, but has long powerful hind legs with which it makes marvelous leaps, clearing from seven to ten feet, and flying along so that its capture is almost impossible. It makes a most interesting pet, but owing to its jumping habits it is difficult to control. A zapus owned by a lady was kept in a room, and one day in a single leap it flew through the window from the middle of the apartment, landing in the garden, and making its escape.

The zapus is a winter sleeper. When the cold weather comes it descends into a burrow that it has made, and at the bottom, two or three feet from the surface, coils up in a nest of leaves and passes the time in a state of hibernation, fairly sleeping the winter away — a habit shared by some bears and the snakes and lizards of northern countries.

A cousin of these, the jerboa, is known in South Africa as the jumping hare, and is the largest of the group, attaining the size of a small rabbit. The jerboa lives in colonies. When leaping along it presents a remarkable appearance, its motion having been compared to flying. A jerboa has been known to leap over a horse and rider, clearing

twenty-five or thirty feet. On returning to the ground they barely touch the feet, bounding again into the air, so that they resemble a bird swooping down and up again.

When observed unawares they present a laughable appearance on account of their upright position, the long kangaroolike legs enabling them to take an almost perpendicular stand, so that they resemble little men moving about. They have the same method of fighting as Dipodomys, striking at each other with their claws.

AN OCEAN SWORDSMAN.

"SHIP'S a-leak, sir." The speaker was the second mate of a large ship outbound from a Chinese port. The well had been sounded that morning as usual, and a foot of water found in the hold, and the leak, as the ship had just been docked, was a mystery.

The cargo was tea, silk, and other valuable goods, so the captain, after vainly trying to discover the cause of the trouble, ordered the ship about. A few days later she was "hove down" in port, and near the keel was found a hole about two inches in diameter, through which the water had poured. The hole was evidently made from

the outside, and extended through sheathing and planking. There were only two animals capable of inflicting such an injury: one was the swordfish, and the other a member of the whale tribe — the narwhal; besides, it seemed hardly credible that either of these animals could have pulled its sword out after striking such a blow. The sailors decided that the swordfish was the attacking party, and upon the return of the ship to England the company that owned the *Dreadnaught* sued the insurance company for damages, and the swordfish made its first appearance in court, represented by Mr. Frank Buckland, the naturalist, Professor Owen, and several others. The case was one of great interest, and for the first time the general public obtained an idea of the force wielded by this swordsman of the ocean. Mr. Buckland, when asked to give an idea of the power of a blow from one of these fishes, replied that he considered it equal to nine or ten blows given with a hammer weighing thirty pounds. His testimony convicted the sword-

Swordfish.

fish and obtained damages for the ship, and ever since the animal has been a marine risk.

The force with which these fishes strike a vessel can hardly be imagined unless the wound is seen: and the occurrence is far more common than is generally supposed. Hardly a month passes but a vessel or boat is struck by a swordfish in some part of the world. It is generally supposed that the fishes mistake vessels for some enemy and rush headlong at them with the terrific speed they are known to possess. Perhaps the most remarkable instance of their power is shown in the attack upon the ship *Fortune*, of Plymouth, Massachusetts. When she returned from the Pacific she was put in the dry dock, when the stump of a sword was observed projecting from her hull. Examination showed that the fish must have struck the *Fortune* with the force of a ball from an old-fashioned twenty-four pounder, as the weapon had pierced first the copper sheathing, then an inch-board undersheathing, then a three-inch plank of hard wood, passing into a solid white oak timber a foot in thickness, then through a two and a half inch hard oak ceiling, finally entering the head of a barrel of oil, the tip of the sword touching the fluid, but not allowing a drop to escape. In its struggles the monster had broken the weapon and escaped, probably to die of starvation.

In large vessels the shock of contact is not felt; but in smaller crafts it is very perceptible. When off Cape Hatteras, the smack *Morning Star*, bound from Mystic to Key West, was struck by a large fish. The men at first supposed they had collided with a floating spar, but almost immediately she began to leak so badly that the captain signaled a vessel to stand by him. The men were unable to gain on the water, and the smack put into Charleston the next day, and was "hove down," when they found that the sword of a swordfish had penetrated planking, timber, and ceiling, so that an entire plank had to be replaced before they could continue. In small vessels the immediate danger is still greater. A dory, struck off Long Island, was sunk; the sword came directly up between the fisherman's feet. Six inches the other way and it would have impaled him; as it was, he had the presence of mind to seize the sword, and though his boat was sinking he held the fish until another boat picked him up. They found him sitting in the water with his coat around the sword. The little sloop *Red Hot*, owned by the United States Fish Commission, was sunk in New Bedford harbor by one of these pugnacious fishes.

It will be seen that the swordfish is a veritable warrior, and when placed before us, its entire make-up

points to speed and activity. It would be selected from among all the fish tribe as a swift privateer, while we might imagine the shark the man-of-war. In general appearance the swordfish resembles the shark, but the lobes of the tail are equal — and what a wonderful rudder it is, with sweeping lines of great beauty, forming a crescent when detached! From the upper jaw or nose extends the cartilaginous sword, covered with a rough skin. It is three or more feet long in very large fishes, and, as we have seen, is a terrible weapon. As might be supposed, Xiphias has another use for it besides thrusting at inoffensive sloops and ships. The sword is the weapon of defense, and with it the fish also obtains its food. The swordfish is a giant armed cousin of the mackerel, yet preys upon it and small fry of various kinds. It follows the great schools north in the spring, and, moving along upon their outskirts, dashes in upon them, slashing right and left with its sword, leaving a shower of gleaming parts behind. The swordfish apparently often kills for the mere pleasure of it, only picking up a few of the dismembered parts, then dashing again into the silvery throng in mere wanton sport. So strong is this habit of striking with its sword that when a dead fish is tossed overboard, the swordfish will strike at it, and attempt

to cut it before making a meal of it. This swordsman is found in nearly all waters. In American waters it rarely attains a length of over fifteen feet, but off Ceylon and the adjacent waters, monsters twenty-five or thirty feet in length are often seen. Some of them are called sailfishes, from the fact that the dorsal fin attains enormous dimensions, and, when the fish is darting along on the surface, resembles the sail of a boat, though more richly tinted than are the sails of boats in general. These powerful fishes are commonly taken by spears; they often do great damage to native boats, sometimes dashing completely over them, impaling the men or throwing them into the water.

On our own coast the swordfish is eagerly sought as a food fish, and several hundred vessels and over a thousand men obtain support from the fishery, which extends from Maine to Massachusetts. The largest fleet of swordfishermen congregates south of Cape Cod, and in the waters about Martha's Vineyard hundreds of the gamy fish are caught. A swordfisherman differs but little from other craft. She is generally a fast schooner, about the size of a pilot boat, and upon the bowsprit is an iron stanchion bearing a rest, so that a man can stand here and lean against it. Lashed to the bowsprit is a long harpoon, known, from its supposed resem-

blance to a lily, as a "lily iron." To this is attached a long rope, which is coiled in a tub, and in turn fastened to a gayly painted keg. Thus equipped, the swordfisherman sets sail, and once upon the grounds a man is sent aloft to "keep his weather-eye out." If good fortune is in store for the gallant craft the man at the masthead soon sings out, "Fish ahoy!" "Where away?" shouts the skipper. "Two points off the weather bow," comes the answer; and forthwith the schooner falls away and follows the directions given by the man who has seen the top or dorsal fin of the swordsman dashing along. In the meantime the mate has taken his place in the cage on the bowsprit, has unlashed the iron lily, and stands ready. Another man sees to the rope —that it is clear—and stands ready to toss over the keg. The schooner shoots ahead, and soon the man at the wheel sees the fish and steers so as to bring it on the weather bow. Not a word is said, and inch by inch they gain on the dashing privateer —now they are up with it. The man at the wheel gives it a turn; the "nose" of the schooner shoots up into the wind, and the fish is brought across the bow. The harpooner raises his arm; a second of suspense, and the steel lily has gone glistening into the gamy fish that, with a tremendous leap of terror and surprise, disappears in a whirlpool of

foam, that, caught by the breeze, drenches the man and deck. The line is rushing over the side, making music that the men like to hear, and the

Sword Fishing.

schooner is kept off to give it full play. The coils leap from the tub like living things, and sometimes smoke rises from the woodwork, telling of the

strength of the noble fish as the end of the rope approaches. The mate takes the keg in hand, and as the last coil goes over, tosses the buoy after it to dance away over the waves, and eventually tire out the swordfish. The schooner now merely follows the keg, which can be plainly seen, and it is but a question of time when the fish will become exhausted. When the keg comes to a standstill the schooner rounds to; the dory is lowered, and it is picked up. The first pull generally starts the fish to renewed exertions, and the schooner falls away again in pursuit of the dory which is now being towed by this finny horse. But the fish is becoming exhausted, and the men now take the line and slowly haul in — a continual struggle until the fish is alongside, when an attempt is made to throw a rope about the sword. In the struggle that ensues, the fish sometimes overturns the boat and throws the crew into the water, or drives its sword into the dory, or gives a vicious slash with its weapon, making the crew lie down to avoid the attack; but finally a rope is thrown about the sword, and the monster is secured and towed alongside the schooner, and soon hoisted aboard. Two days later it is in the Boston market.

A curious fact in connection with the swordfish is that, common as are the adults, probably no

fisherman on the American coast has ever seen a young one, or one less than a foot long. This is owing to the fact that the swordfish breeds upon the high seas, or possibly in European waters. Young ones are often seen on the Mediterranean shores, and the fisheries there are probably even more valuable than in America. The young swordfish — the infant — is so unlike its parent that few would recognize a relationship. Instead of a sword, it has jaws of equal length, armed with fine, sharp teeth. Some species have long sharp spines projecting from their various parts, and they change in appearance as they grow older.

The Greek swordfishermen, and especially the Italians, follow the fish in a large rowboat, the harpooner standing upon an elevated perch at the bow. As they row along the men sing songs and utter prayers that are supposed to give them good luck. With the heavy boat, clanking oars, and the sound of many voices, noise enough is produced to alarm the fish if it were in any way timid, yet the men bring in many hundreds of pounds, and are even more successful than the skilled harpooners of American waters. Swordfish duels are not uncommon, and the writer once found a swordfish which had been run through and through by another swordsman of the sea.

ANIMAL RESTORATIONS.

To many persons it seems marvelous that a naturalist can build up a complete animal upon the foundation of a single bone or even a tooth. But for the student of anatomy it is not so difficult as it appears.

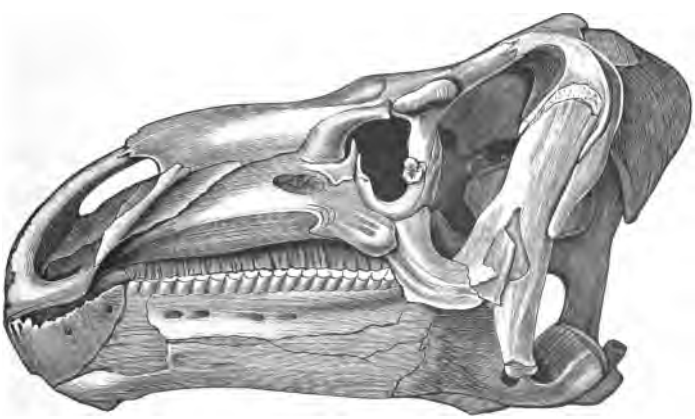
The result of the construction or building up of extinct creatures is called a restoration; and scientific men have become so expert in it that they undoubtedly produce forms which vary but little in appearance from the actual animal represented.

The most remarkable restorations of modern times are those at the Crystal Palace at Sydenham, a few miles from London, where an attempt was made not only to restore some of the gigantic animals of a past age, but to reproduce their surroundings; for it must be remembered that in the past ages the vegetation was as different from that of to-day as were the forms of animals.

The geologist who undertook this was perfectly familiar, through special study, with the huge creatures of the cretaceous or chalk age; and by comparing the bones found in England and other countries with those of existing forms, he was enabled to reclothe them in apparent flesh.

It was easily demonstrated that the gigantic iguanodon, the bones of which were discovered in England, was an ally of the South American iguana — one of the lizards. So the skeleton was rehabilitated with the allowances due to the difference of structure.

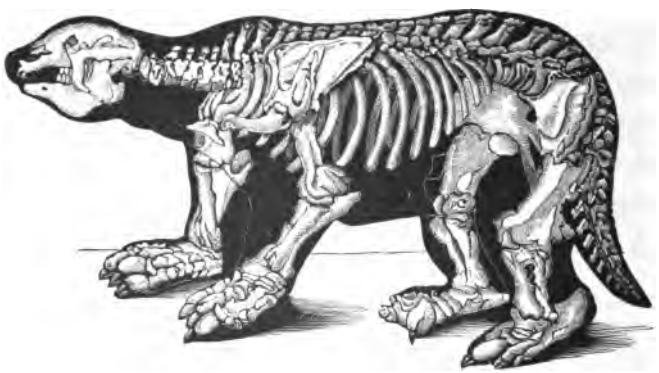
In this way this mighty lizard was restored. First, a model was made in clay and then enlarged; and the actual life-size model was produced by using hundreds of pounds of mortar, lime, brick, and stone, not to speak of iron columns.



Skull of an Iguanodon.

The iguanodon was a gigantic lizard. Resting upon the ground, it could reach twenty or thirty feet into the air, and must have been one of the most wonderful creatures of a past age.

In this collection is the megatherium, known to be an ally of the sloth. The latter, now found only in South America, is a small animal found clinging to trees; yet here was an ancestor that weighed



Megatherium.

perhaps many thousand pounds when it inhabited the earth. It rested upon legs colossal in size,— more like columns of support than limbs for locomotion,— and standing on its hind legs, tore down tall trees, upon which it fed.

Some years ago the report came from Charleston, South Carolina, that extraordinary teeth were being found at that place, some of which were as large as the human hand, if not larger. The geologist immediately recognized them as shark's teeth. The largest were almost identical in form with the teeth of an existing shark known as the white shark or

carcharodon. This monster is found in various seas, the largest individual ever caught being thirty-five feet in length.

The teeth of this giant were not more than one inch in length — pygmies when compared with the enormous plates of dentine from the Ashley and Cooper rivers. To the makers of restorations, the difference in size and the similarity in teeth is suggestive.

If the carcharodon with the small teeth was thirty-five feet in length, what must have been the length of the shark with the teeth as large as a man's hand?

To determine this question the author once took the jaw of a modern shark, and placed the large teeth in the same position in which they were found in the small jaws. The result was a shark from one hundred to one hundred and twenty-five feet in length, whose enormous mouth could have encompassed a dozen men. Indeed, in a moderate-sized fish of this species, a man might have rested on the lower jaw, using the upper as a protection.

Imagine a man-eating shark as large as the largest whale, and some idea can be conveyed of its appearance. In the day when this giant creature lived, it was the scavenger of the sea, preying upon all other animals — upon the gigantic turtles

and other strange forms of the time which happened in its path. What a spectacle must have been presented when its enormous mouth opened, and eight or nine rows of gleaming teeth in each jaw rose up as so many knives to sever the victim!

The teeth of this shark are beautiful objects. They are as brilliant to-day as they were untold ages ago, when the huge shark roamed up and down the Atlantic, which then encroached upon the land much more than at present. The teeth have been found by thousands in what is now Charleston. They have been dredged in the deep sea, and taken from the exposed slopes of big mountains in southern California.

Some years ago a paleontologist discovered some of the bones of a fish in a certain deposit, and from them made, perhaps for his own amusement, a restoration or outline of the fish, showing it to be a curious eel-like creature.

Time went on, and finally came the report that this fish was not extinct, but still lived in the waters of Australia, and this was found to be a fact. The fish, known as the ceratodus, had outlived its age, and now stood as a proof of the correctness of the restoration which had been made from fossil remains.

Thus the ancient inhabitants of the earth can be

restored with more or less accuracy, often the smallest bone telling a remarkable story. The splint bone in the horse is an interesting example, as by it the evolutionist traces back the lineage of this domestic animal to a time when it was not larger than a fox, and had three or four toes.

ON GUARD.

In driving through one of the lower counties of California I once came to a field in which there were forty or fifty black pigs, on the back of each of which there were one or two blackbirds. The latter espied me immediately and uttered an alarm or warning, at which the pigs looked up and then ran away, some still carrying their sentinels on their backs. Such an exhibition might be accidental, but I have seen it repeated on several occasions; and am certain that birds warn various animals which they affect.

A familiar example is seen in the moose, which permits various birds to run over it, in all probability in search of insects. The hunter stealing upon the animal may find it asleep in some out-of-the-way nook; but the watchful jay is on guard, and, uttering its note of alarm, the moose springs to its feet and rushes away. That this animal submits to the attention of the jay is well known, the bird having been observed running over its body with the greatest freedom.

In Central America, especially in Nicaragua, a singular bird, called quiscalus, is very assiduous in its attentions to wild cattle, taking its place on their backs and elevating and depressing its long neck and tail in a remarkable manner. But does an enemy approach, the black, grotesque creature immediately utters discordant shrieks which have an immediate effect upon the cattle, who toss up their heads and rush into the bush.

In Africa this guardianship between birds and oxen is so well established that certain birds are universally known as oxbiters.

One of the best known of these feathered guardians is the red-beaked oxbiter, a little bird not larger than a robin, with a deep red beak and eyes that sparkle with a golden gleam. Wherever wild cattle, large antelopes, the camel, rhinoceros, or

elephant are found there will the guardians be seen, perching on their backs or running over them with an audacity that is amazing. On the camel the oxbiter will run up the woolly neck like a woodpecker, perch upon the ear of the patient animal and examine it intently, while others cling to various parts of the creature, which is perhaps half asleep.

So watchful are these sharp-eyed birds that at the first suggestion of an enemy's approach the birds rise from the backs of the herd, uttering loud

Rhinoceros Birds.

and discordant cries, which are interpreted at once. At the first warning note the huge animals rush blindly into the bush, leaving the sportsman

mortified at his seeming lack of skill in stalking big game. So watchful are these birds in discovering an enemy that they constitute an important feature in the calculations of the hunter or sportsman in the Dark Continent. One species is called the rhinoceros bird on account of its partiality to the rhinoceros, numbers being seen clinging to the hide of the big animal or perching upon its ears and horns.

Drummond, the well-known naturalist, found it extremely difficult to deceive these watchful guardians. On one occasion he had stalked a Cape buffalo and a water antelope for hours, never exposing himself, knowing that the birds were on guard. Finally he reached a situation favorable to a shot, when an eagle-eyed bird uttered a sound like "tcha-tcha," and the entire flock rose into the air with loud cries, at which the ox and antelope dashed into cover.

That these feathered guardians are attached to the animals is suggested by the pertinacity with which they cling to them. A hunter had succeeded in approaching a rhinoceros, when the birds gave the alarm and away dashed the big creature. Some of the birds hovered over the flying animal, but several clung to its hide, often brushed off in the flight through the brush, but renewing their position despite the wild race.

When the rhinoceros was finally killed the birds clustered in the neighboring trees. The following day, when the sportsman returned to skin the animal, the little guardians were found sitting on it, and when the native gun-bearers appeared they uttered their alarm cry and even brushed their wings in the face of the dead rhinoceros in their efforts to arouse it.

The sluggish hippopotamus and the elephant serve as a perch for a small white heron which is extremely watchful, rising at the slightest alarm, the flapping of its wings being the signal at which the animal steals quietly away, to be rejoined, in all probability, by the white sentinel.

This singular guardianship is not confined to quadrupeds exclusively; certain birds are known to extend a limited protection to other birds, an interesting example being found in northern Africa, where a copper-colored flycatcher has been observed standing guard upon storks. The latter were walking along sedately, feeding upon the myriads of locusts which covered the ground, and upon the back of nearly every one was a flycatcher. The observer, who was a naturalist, watched the birds for some time until one of them espied him, when the entire flock rose, uttering loud cries, which so alarmed the storks that they too took flight. The

wattled starling stands guard on various birds, and has seriously interfered with the plans of many sportsmen.

In various countries this singular instinct or guardianship of certain birds is taken advantage of. Thus the wing-spurred chauna, of South America, is sometimes found in the dooryards of well-to-do natives acting the part of a guard to its owner's property. The bird is remarkable for its pugnacity; and its cry, a harsh, penetrating scream, is sufficient to demoralize a much larger foe. These birds are placed in the farmyard when young, and are considered a safeguard against hawks and various predatory animals. Shepherds employ them to guard their flocks, and more than once the wing-spurred bird has stood between the lambs and the puma, proving itself one of the most effective of the feathered guards.

PRISONERS FOR LIFE.

A CAPTAIN of a vessel once brought from the Philippine Islands an object which he claimed was the skeleton of an animal that had been taken from the deep sea of these islands. It was tubular in shape, about two inches across and eight inches high, and made up seemingly of white, silvery spun

glass, worked and woven as if by fairy hands, so that it presented a reticulated surface and a general structure so marvelous that not a few persons who saw it believed it to be some cunning work of the Chinese or Japanese, whose strange productions are so fanciful in their design, and were then just becoming known. Scientific men, however, pronounced the rich vase the framework of a silicious sponge, and named it the *Euplectella*. It is commonly called "Venus's flower basket."

Venus's Flower Basket.

If we examine one we shall find that the little square portholes or reticulations are a prominent feature in its formation, the little windows being just large enough for a very small animal to creep or crawl through. One day while examining the structure of one of these vases, I noticed two little claws of a crab reaching out toward me, each one being extended through a porthole, if so we may term the little orifices. By cutting away a portion of the vase a good view of this inhabitant of the sponge was obtained, and a melancholy spectacle it was, for here was a crab that through mere curiosity in its youth had strayed into the sponge, and, like the prisoners of old, had been literally walled in. It had grown so large that escape was impossible; and finally, when the sponge died, it was found with its claws extending through the bars of the prison as though imploring aid.

The crab had entered the sponge when it was a minute creature known as a zoëa. It soon grew too large to escape, and had lived upon the sponge, or the food wafted in, and was found only when the beautiful sponge died and was deprived of its rough and unsightly exterior. Among the crabs we find many prisoners; thus the little forms that live in oysters are prisoners in the shell; resting among the soft folds of the oyster they pass their time,

rarely, if ever, venturing forth, and feeding upon the various objects that are wafted into the mollusk by its cilia.

The old naturalists, as Pliny, were familiar with many prisoner crabs, as there are several bivalves that possess them, and believed that between the ill-sorted pair there was a partnership to the effect that the shell should provide the crab with protection, and that the latter should keep a "weather eye out" in the interest of its host, a sly pinch from one of the biting claws being the signal for the valves to close. Undoubtedly the oyster received many signals, but I am afraid they were all in the interest of the crab, and were attempts to dine upon its host.

The barnacles, cousins of the crabs, might be termed prisoners, as they are unable to move from where they take their original stand, though many fasten themselves to moving objects, and so lead a compulsory roving life. One is found growing upon the feathers of the penguins in the South Pacific, and I have taken a goose barnacle from the mouth of a sunfish,— a curious prison indeed,— where the stalk was just long enough to prevent its being crushed by the curious teeth of the huge mola.

One of the strangest prisoners to be found any-

where is the little eel or lancelike fish fierasfer. Nearly all the members of the family appear to lead a life of singular retirement. I found my first specimen in wading over the Florida reef, about sixty miles beyond Key West. I had lifted a long sea cucumber or holothurian from its bed on the soft sand of the atoll, and was about to place it in a glass, when, from the creature, appeared the head of the fish. I placed it in the glass tank, and it soon came out, the veriest ghost of a fish, so silvery white that I could almost have read print through it. It swam about for a while, then dropped to the bottom and died at the very moment of its seeming release.

On the reef we often found these curious prisoners, but never without their living prison, and I was forced to believe then that they never, at least at this place, came out. Recent investigations at the Naples aquarium have shown that they do venture into the outer world, and perhaps the most astonishing feature of the entire performance is the return to prison, for the fierasfer is a ticket of leave fish, and reports at headquarters with great regularity.

The curator of the aquarium above mentioned, while watching them, observed one of the fishes approach its living prison, and insert not its head but its tail into the door, and gradually begin to

disappear as if some mysterious power were drawing it in, until it had completely disappeared. This curious performance of backing in is conducted by the holothurian itself, which in inhaling water draws the fish in with the current, leaving it finally with its head pointed outward all ready for another journey into the outside world. The fierasfers of some localities live in star fishes, and many, as I have said, have this curious habit assumed after many years. At first it was possibly an accident, but it has grown to be a fixed feature in the life of these fishes.

If we leave the world of the ocean, we shall find many curious prisoners on land. The female hornbill is entombed by her mate in a hollow tree, the latter patiently feeding her through a small window until the egg or eggs are hatched.

Some ants make prisoners not only of their allies, but of beetles and other insects, keeping them in the care of aphides for their so-called milk, and again for the perfume or odor some beetles emit, while many are kept merely as prisoners to act as slaves, and to perform the hard work of the community. In all life we find these strange features, so similar to many of our own, pointing to the assumption that the same general laws and impulses govern all living creatures.

THEIR MAY MOVING.

THE 1st of May, especially in the Middle States, is moving day. It is then that leases expire, and there is a very general movement among large numbers of persons.

The animals also have their moving day, and while it is not necessarily upon the 1st of May, it

"The animals also have their moving day."

generally occurs within a few days, or even hours, of a certain time, year after year.

One of the most remarkable illustrations of this is found among fur seals, which are so common on the Pribilof Islands in our Alaskan possessions. When first discovered, their numbers were beyond all computation. They seemed to fairly blacken the shores of the islands of St. Paul, St. George,

and others, and the intrepid mariners were amazed at the spectacle. An elaborate account of the discovery was sent to the home government, which ordered an official to report upon the same. To the astonishment of the officer, he failed to find the seals, while the original discoverer, who had accompanied him, could only point to the places where he had seen them, and reaffirm his statement.

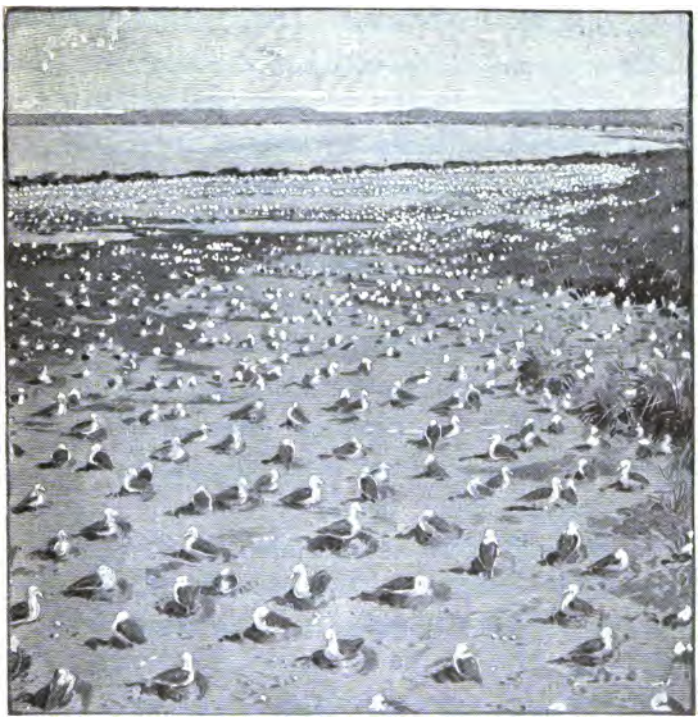
The seals had merely moved in a body, and it was many years before it was definitely ascertained where they went. Since the discovery of the fur seals at least three million have been killed, yet a very large herd is still found on the island. But when autumn approaches they move, passing out of Bering Sea, spreading over an area one hundred or two hundred miles in width, and forming in their migration a perfect horseshoe of swimming seals, the extreme southern portion of which reaches nearly to the Santa Barbara Islands off the coast of southern California. This point is reached in midwinter or February, when the seals turn inshore, swimming on the edge of the Japanese current, reaching their rookeries in Bering Sea again in early spring; thus having passed the winter drifting south in the current that sweeps down the Pacific coast of North America.

During all this time the seals do not land, living

a life in the open sea, and making one of the most remarkable migrations known.

Explorers in the southern ocean have made extraordinary discoveries among the birds of that region. Here is the home of the penguin, that lives in rookeries so vast that men have been lost in them and nearly killed by the concerted attacks of the birds. One breeding ground or rookery contains at certain times thousands of birds which are incapable of flight, and resemble seals in their modes of progression, using their long, narrow wings as fins. A man-of-war once touched at Inaccessible Island in March, and found the rookeries covered with birds; returning in May, the island appeared to be deserted, and to this day where this conspicuous body of birds spends the months of April, May, June, and July is one of the mysteries of the sea. The flock of penguins, which must cover many square miles in its movements, has never been sighted at sea by a vessel. Perhaps the most remarkable feature of this moving is the return of the birds to this rock over the trackless ocean, where there are no landmarks.

A number of years ago I was fortunate in observing a curious migration in the Gulf of Mexico. A small island called Bird Key was visited, and as there was not a bird to be seen, the question why



"It was almost impossible to walk without stepping on the speckled eggs."

the island was given so misleading a name was asked; to which an islander replied that the following month, or in May, it was a bird key in every sense of the word. This was found to be true. One morning I saw what I supposed was a cloud hovering over the island, but upon approaching the latter the cloud proved to be an enormous flock of

birds, that had come from no one could tell where. There were six or seven islands in the group, but the birds alighted upon but two, and when on the ground almost covered it; indeed, it was almost impossible to walk without stepping on the speckled eggs. In a few weeks the birds, which were gulls, mysteriously disappeared. The nearest points were Cuba and Yucatan, but the birds could not be traced to either.

That fishes move on an extended scale is well known. I have observed the effect of the sudden arrival of a vast school of small sharks on the Maine coast. They evidently came in from the deep sea, and were as ravenous as wolves, in a single night completely stopping the fishing. The water was alive with them, so that it was far from safe to fall overboard.

The movements of the shad and salmon are familiar, and on the Pacific vast schools of barracuda and yellowtail move up and down the coast with the coming and going of the seasons. Some migrate to well-defined regions; others mysteriously disappear.

I have observed an interesting movement of a vast swarm of yellow butterflies in southern California. They covered an area three or four miles wide and one hundred or more in length, and were

following the general course of the coast, though thirty miles inland. They flew near the ground and quite rapidly, with a peculiar fluttering motion. Extraordinary movements among butterflies are not rare. A swarm mentioned by a South American traveler was ten miles in width, and was a day in crossing a wide river, the mass of insects being so thick that at a distance they resembled smoke blowing from a conflagration.

FISHES OUT OF WATER.

WHETHER it is any more remarkable for a fish to leave its native element and wander around on dry land than for a bird like the ousel to enter the water, fly through it, and walk along the bottom in search of food, I leave my readers to determine; but it is true that certain fishes leave the water to search for food on land, and others go ashore for various reasons.

Some years ago I spent the summer at a little fishing village on the Maine coast. Near the ocean was a lake into which, at high tide, the clear water of the ocean flowed, while at the ebb it ran into the ocean again; so at the flood the lake was a large body of water, and at ebb tide a very in-

significant pond, from which bunches of rushes protruded everywhere.

The lake I soon discovered was famous for its eels. One evening it happened that I was on the beach as the water was leaving the lake, and waded out into the little inlet to cross it, when I found that it was black with eels of all sizes. The moment they saw me scores left the water and dashed away over the stones in every direction, making for the ocean, presenting a very extraordinary spectacle. They seemed as much at home on the dry land as in the water, and made remarkable progress over the stones.

That eels leave the water and roam about on the flats is well known. Near any eel pond their trails can be seen, winding away to the ocean, perhaps near at hand — all of which shows how fishes differ in their habits. Thus a shad or a perch would soon die, and could not make a single move for its protection, being utterly helpless on land. So, too, a robin or sparrow would soon drown in the water, while the duck or ousel is apparently in its native element, which shows us that various animals are admirably adapted for different surroundings.

When Americans first visited Australia they found that the natives had many and very singular

stories regarding the animals of the great continent. One was that a certain large fish, the ceratodus, came to the surface at night and wandered about on the shore, uttering a noise like that of a bull; in fact, a bellowing sound. Naturally such a fish story was discredited and laid to the superstitious natives, but finally one night a party of surveyors, who were out, heard a singular sound and killed an animal which was moving through the grass, and which was found to be this native fish, that was wriggling its way overland for some purpose. The noise was caused by the expulsion of air from the air bladder of the fish.

A party of English officers upon one occasion were encamped in a certain portion of India, when their attention was attracted by a rustling sound in the grass and leaves. Investigation showed it to be caused by myriads of little fishes which were headed in one direction, moving slowly on by using their side and small fins as feet; now upright, now falling down, squirming, bending, rolling over, regaining their finny feet and again pressing onward.

These fishes were the famous climbing perch, about which so much has been said and written, and they were passing over the country to avoid a drought. When the stream in which they have

been spending the season dries up they scale the banks, and, directed by some marvelous instinct, crawl to another.

The climbing perch was first observed by a naturalist over a century ago, one having been caught high up a palm tree, where it had gone, it was said, to obtain the moisture that might be found in the crevices of the leaves. This story was doubted by many, but a perch was found in the tree by M. Daldorf, so the circumstance may be placed among the strange facts of natural history.

Climbing Perch.

The most remarkable dry-land fish is a little creature about four or five inches long, with a big head, prominent eyes, and side or pectoral fins that are more like legs than anything else. This goby, for that is the family to which it belongs, is a marine fish, and actually goes ashore to obtain a portion of its food. If we were on the watch at low tide in Mauritius, where it is common, we should see, as the rocks become bare, various broad heads popping up here and there, then a big tad-

polelike creature jumping from one to another or edging its way up the side. Their object is to catch small mollusks. Some years ago a friend of the writer, an ardent naturalist, was very much interested in these little fishes, and combined sport and collecting in a novel manner. He caught his periophthalmi with a shotgun, picking them off as they hopped along the broad muddy flats.

Gobies.

In New Zealand the gobies of several species have this habit of leaving the water and scrambling along shore, and are called "running fishes" by the natives on account of this singular feature. At Whampoa a fish called the sunghong is often seen out of the water, while the Chinese have what they call the pakkop, or white frog, that can live for some time out of its native element. These people also speak of the flower fish, or hawaya, as leaving the water.

On our own shores we have a goby that has a

somewhat similar habit. An expedition of naturalists to Mexico and Texas found some of the little fishes and confined them in a pail. They remained there for a short time, then, to the astonishment of the observers, several were seen clambering over the side of the pail and quietly dropping down upon the ground, when they proceeded to wriggle their way to the water, not far distant. They used their pectoral and anal fins as legs in this instance, and succeeded in making very good progress. When replaced in the bucket they soon crawled out again, and could be kept in only by placing a plank over the top of their prison.

In countries where there is a decided wet and dry season, fishes are often obliged to migrate or hibernate. In the latter case, when they find they are unable to reach the water they burrow into the soil, remaining in this condition for months, or until the rain comes. This habit has been made the occasion of some remarkable surprises. Thus, a party of hunters were camping upon the edge of a little depression that was absolutely barren. A rainstorm came up suddenly, and soon the depression became a lake. In an hour the croaking of frogs was deafening, and an examination of the surface showed that the place was well stocked with fish. The moment the moisture reached below the

surface the fish had revived and made their way up through the mud. One of the curators of the British Museum some years ago received a dry and well-packed object that appeared to be a ball of mud. The instructions were to place this in a dish of slightly warm water, which was done. Slowly the ball dissolved, and as it finally fell apart a long eel-like fish rolled out, gave several gasps, and began to splash about. The ball of mud had been the hibernating nest of the fish, and had been sent this long distance safely in a tightly packed box.

Hibernating Fish.

Travelers in South America are sometimes regaled with wonderful stories regarding the overland trips of certain fishes, and in many instances the accounts have been substantiated. These catfishes exist in vast numbers in the streams and pools, and like their East Indian allies, they mi-

grate overland, presenting a most singular appearance.

Another catfish in South American waters is often seen on partly submerged logs, apparently having the habits of a frog. In England the familiar little fish known as the blenny has a curious habit of basking in the open air at times. This was first noticed by a naturalist named Ross, who kept several of the fishes in an aquarium. He had great difficulty in making them stay in the water. At certain times during the day they would make desperate and often successful attempts to get out. Finally, upon the advice of a friend, he placed a stone in the tank so that part of it was exposed, and out upon it climbed the blennies. They seemed to require air, and from choice spent part of the time out of the water. Singularly enough, this was during the ebb tide, the period when they would naturally be left high and dry in the pools along shore.

You may wonder how these finny wanderers can breathe out of water. All fishes breathe by taking in water, which is supplied with air, and expelling it at the gills, these blood-red organs taking up the oxygen during the contact; but when a fish is out of the water it would seem necessary to have some other means of breathing, and this is the

case. They do not carry water or store it, as some have supposed, but the cavities which are found in the head of some are supposed to be for the reception of air; in others the air bladder, which is permeated with blood vessels, serves as a breathing organ or lung.

BIRDS OF THE OCEAN.

THE birds of the ocean, the tireless fliers, long of wing and light of body, the gulls, petrels, and their giant allies, the albatrosses, have always been associated with the romance and mystery that surround ocean life. The appearance of the albatross far out at sea, its silent flight, its somber garb, its complete indifference to the terrors of wind and wave, act strongly upon the

Albatross.

imagination. So with the petrel, which also defies the storm and gayly trips a measure to the howling gale. It is sacred, and its destruction considered ominous of dire calamity.

The gulls constitute the feathered ornaments of our harbors and shores, their graceful flight, long, slender wings, and striking contrasts in black and white rendering them particularly attractive. On the various portions of the Atlantic and Pacific coasts their breeding places are found; but it is in the South, in isolated regions, that they are seen to the best advantage and in greatest numbers.

It is in the southern seas, on the borders of the Antarctic Ocean, that the most extraordinary phases of oceanic bird life are found. Here is the home of the penguin, the group representing one of the lowest forms of birds. When in the water they are to all intents and purposes fishes, using as fins their paddlelike wings, which appear to be covered with fine scales instead of feathers. In the water they lie prone, diving from wave to wave like seals, and might readily be taken for small cetaceans. When leaving the water they scramble or crawl up rocks on the shore in a clumsy manner, then assuming an upright position and an appearance more extraordinary than ever. In many cases they seem to affect strange atti-

tudes, often standing in line or marching in columns of four or more, or in a single file to the beach, and in certain large forms creating the impression on distant observers that they are men going through some drill or exercise with the regularity which military discipline demands.

The rookeries of the penguins are of vast extent, especially those of the island of Tristan da Cunha, one of the so-called inaccessible islands lying between Cape Horn and the Cape of Good Hope, in the southern ocean. The island is a desolate place, containing about sixteen square miles, nearly circular, with peaks rising to an altitude of 8,300 feet, which are capped with snow nearly the entire year. The locality is cold and barren, yet is the kingdom of the penguins, their cities of millions of inhabitants having been established here for untold centuries.

The rookeries are formed near the water in tracts covered by stout reddish tussock grass, which grows so coarse and in such solid clumps that at the base it is almost as hard as wood. This grass, higher than a man's head, is pierced in every direction by the streets, lanes, and avenues of the penguins or rock hoppers. The bird is one of the most singular of its kind, standing about a foot and a half high, covered with a close-fitting

set of feathers much resembling those of the grebe. The general color of the back is slate-blue, while the breast is snow-white. From the base of the bill extends backward a mustachelike plume of a rich sulphur-yellow, which is held erect when the

Penguins.

bird is on land, and by its motions gives it a most whimsical appearance. Add to this a bright red bill, richly colored eyes, and wings like paddles, and we have the curious bird that occupies the greater part of this inhospitable region.

Several years ago an attempt was made to examine thoroughly and map one of these penguin rookeries — a task not only disagreeable but abso-

lutely dangerous in some instances, as shown by several accidents resulting from the combative and aggressive nature of the birds, which not only did not fear the visitors, but resisted their advances all along the line. The party landed on the rocky shore of what appeared to be a street leading up to the tussock rookery. It was about twenty feet wide, and as the boat approached large numbers of penguins were seen passing up the slippery walk or standing in groups in the entrance, where they were readily photographed. As the explorers passed up the street they found themselves in a perfect maze. The grass rose high above their heads, touching at the top and forming arches. The streets led off in every direction, often branching in a manner bewildering to the explorer. The avenues and lanes were packed with birds, the heat was intense, while the noise from ten thousand throats was like thunder.

The streets were the breeding grounds, and so closely placed were the nests and eggs that it was almost impossible to move without stepping upon them. On each nest sat a sharp-beaked bird, its head drawn back, uttering in ferocious guttural, "Caa, caa, urr, urr," the peculiar sulphur-colored mustache vibrating with excitement. It was impossible to avoid them, and the sharp beaks soon

began to tell on the legs of the white intruders, with effect, so that the birds had to be unceremoniously tumbled aside with sticks and clubs.

In one trip the investigators actually feared for their lives and were obliged to run, dashing over the myriads of birds which attacked them with the greatest fury. By making a series of such rushes, with heads down and stopping occasionally in clear places, progress was finally made through a portion of the rookery.

The nest is a simple depression in the soil, in which two greenish-white eggs are laid, and they are placed everywhere without discrimination.

The danger of becoming lost or bewildered in this curious labyrinth can hardly be overestimated. Professor Mosely, the English naturalist, who had a remarkable experience in these rookeries, had a "desperate struggle" through the grass and penguins, and "at last had to come back beaten." With his men he literally fought his way over the rookery, and two dogs with the party had to be dragged through, being utterly unable to face the birds; and despite their efforts one dog was finally lost and probably killed by the ferocious throng that had taken possession of at least a quarter of the island, representing in estimated numbers at least four hundred thousand penguins.

At Marion Island the gentoo penguin is found—a tall, finely formed bird with a red, sharp-pointed beak, its back dark and breast white. They afford a good example of the use of the fin-like wings as fore limbs, for when pursued they throw themselves upon all fours and dash along, using their wings as hands or feet, throwing the mud and sand so effectively that the follower is glad to give up the chase.

The rookery of Marion Island is distinct from the other portion, and contains all the young and breeding pairs. The sight presented by the young here is a grotesque one. The latter, even when as tall as the parents, are covered with down at least two inches deep, so that as they move about with beaks pointing almost directly upward they look as though they had been inflated. This absurd appearance is increased tenfold when the down begins to give place to the more mature plumage. In some, patches of brown appear on the back, with feathers projecting through; others have merely an exaggerated Elizabethan ruff or collar.

In a corner by themselves the breeding birds are found lying together in slightly stooping positions. When approached they do not move off so readily as the non-breeders, and hold their feet together. No egg is seen by the disturber of their peace, but

it is there, and as the penguin moves away it skillfully carries the egg with it, bearing it in a perfect pouch between the legs, holding it in by tucking the feet up beneath. There is absolutely no nest, and in all probability the egg is held in the pouch for nearly the entire seven weeks of incubation, or until the young is hatched, the male doubtless feeding its mate. The birds are very jealous of their positions, and if one of the downy young, which are continually running about uttering a singular whistling cry, infringes on the ground of a breeder, it is immediately attacked in a savage manner.

In this rookery and about it lived numbers of sheathbills that were so tame that when a party of explorers approached they came running up in numbers, exhibiting the liveliest curiosity, uttering a "cluck, cluck," like chickens, only with a half-defiant note. They were pushed aside with sticks, and when a stone was thrown at them they immediately ran up to the thrower as if to see how it was done. The sheathbills were the scavengers of the rookery, and when an egg was broken they at once ran up and ate it. Overhead were flying the most powerful of the gulls, the skuas, also scavengers, and so bold that they swooped down and carried off dead birds almost under the feet of the men.

While the king penguin does not build a nest, this is not true of all the tribe. The Magellan penguin makes large and very deep burrows in the peat banks, so that often the ground is hollowed in every direction. They have a singular habit, found among a few land birds, of collecting various objects. Thus, in front of the opening of their burrows are found numbers of pebbles of different sizes and colors, which are brought up from the shore, apparently simply for ornaments or objects to please the eye.

AN INVADING HORDE

"SOME years ago," said a famous traveler, "I took an extended drive through the best parts of Tunis, Algiers, and Tripoli. I made the trip in the course of the winter, and as the hot season approached I found myself in Algiers, and ready to return to the North. Our last ride was about two hundred miles across a rudely farmed piece of

country — a most uninteresting and eventless trip it would have been but for one incident.

"Early in the morning, which was intensely hot, our driver had pointed out a dark cloud hanging over the horizon a few miles away. I paid little attention to it, until I saw that it was drawing nearer, and then I asked what the chances were of our getting wet.

"'Wet,' answered the native driver; 'it is something worse than rain, the old plague of the country, the locust.' It was true. We were advancing upon an army whose numbers it was impossible to compute, and whose power of devastation was more complete than that of any human army — insects by the hundred billions filling the air, and forming high toward the heavens a funnel-shaped object, a living cyclone.

"It came rapidly down upon us, and before long the advance guards struck us — ugly brown locusts that flew against the animals, striking our faces, crawling, flying everywhere. The animals soon became alarmed by the constantly augmenting numbers; the horses reared and tried to break away, snorting in the greatest terror. If the truth must be told, their owners were hardly less alarmed than they.

"The air was filled with locusts. They covered

the ground so that, look which way you would, it was a crawling, swaying mass of life. Every moment matters grew worse, and it became darker. They were so numerous that they hid the sun, and made the day seem as dark as though a fog bank were blowing in.

"The frightened animals were put at full speed, and we dashed into the thickest of them. I tied a cloth over my head in order to shut them out, but it was useless. They covered everything, penetrated anything, and literally swarmed over us. For a few moments the maddened horses dashed along; then they began to lag, and finally they came to a dead stop, and one went over the traces and fell in a living sea of locusts. The insects covered the ground so thickly that the wheels were clogged, and the horses floundered in them as they would in snow.

"It was a disagreeable sensation to sit in the living rain and be pelted with them; but there was no help for it, and for two hours we endured it. Then the insects passed on, and we managed to bring the horses through.

"As we emerged from the cloud and passed over the country they had devastated, it was like riding over a burnt district. Every blade of grass and every green thing had disappeared, and starvation

stared people in the face. They had literally swept over the country like flame, and removed every vestige of vegetation."

In the same region, a swarm of locusts, even more extensive than that described, appeared in 1888. Not only famine but pestilence threatened the entire country by the enormous accumulations of dead and living insects. To fight this dreadful horde, over sixty thousand laborers and two thousand soldiers went out, armed with sticks, clubs, and firebrands, but their efforts seemed to have no effect.

It is difficult for those who have never seen such a destroying force to realize its awful meaning. The advance of such a legion may well be compared to that of an invading army. True, the people are not killed, but their means of living are taken away, and they often starve to death.

The most devastating wars in the history of the world have been between human beings and these seemingly insignificant insects. When they appear in a country the note of warning is sounded, and every man, woman, and child enlists to evict the invaders. The locusts pour out from the earth in millions, or sweep down in vast bodies. Fires are started with the hope that the smoke will destroy them or turn their course; but, as a rule, when they

once gain a foothold they press on, and by sheer force of numbers carry everything before them.

They enter houses, crawl through windows and doors, cover the floors, and accumulate wherever they are killed or crushed, thus producing disease and pestilence.

There are on record several interesting accounts of these insect wars. The earliest is found in the Bible, where the grasshopper is described as one of the plagues of Egypt. In the Book of Exodus, chapter x., we find the following:

"And the locusts went up over all the land of Egypt, and rested in all the coasts of Egypt: very grievous were they; . . . for they covered the face of the whole earth, so that the land was darkened; and they did eat every herb of the land, and all the fruit of the trees which the hail had left: and there remained not any green thing in the trees, or in the herbs of the field, through all the land of Egypt."

From very early times certain portions of Africa have been particularly subject to these invasions, and, according to Pliny, the inhabitants of Cyrenaica were frequently raided by them; so that laws were made for the protection of the land, and every person was obliged to kill a grasshopper, in whatever stage it might be found.

In Lemnos, many years ago, a law obliged every person to pay a tax of grasshoppers, or bring to the magistrate certain measures of the insects. In this way it was hoped in time to wipe them out, but it is needless to say that it had little or no effect upon them.

The amount of damage accomplished in these raids by the common enemy cannot be realized; only a rough estimate can be given, and the appearance of the horde creates far more consternation than a declaration of war between nations.

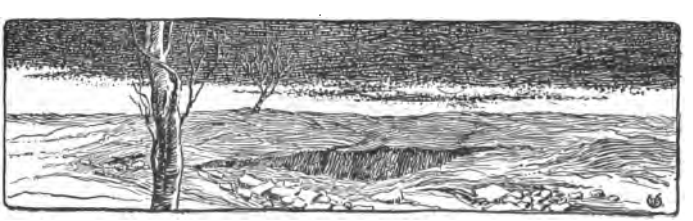
In the year 591, a swarm of locusts appeared in Italy. Men gave the word of alarm, which was carried from village to village, and every effort was made to destroy them; but they stripped the country over which they passed, and finally, after a high wind had blown them into the ocean, they were washed up on the shore in such numbers that a plague was produced that carried off the inhabitants by thousands.

To estimate the number of locusts in one of these clouds seems impossible. In 1748 armies of them entered Europe, invading parts of Wallachia, Moldavia, Transylvania, Hungary, Poland, and Germany, and scientific men endeavored to calculate their numbers. It was found that the right and left wings of one army rested upon villages forty miles

apart. The length was so great that, though flying at a rapid rate, the cloud was three hours passing a given spot.

An army of insects seen in Africa by Barrow in 1797 was estimated by him to cover an area of two thousand square miles! Like a swarm previously referred to, they were blown into the ocean, and for fifty miles along the shore he found them washed up in banks from three to four feet high.

The Rocky Mountain locust has caused immense losses, and is probably the most dreaded in this country. The eggs are deposited in the ground. They hatch in March and April, and begin their life as wingless, voracious larvæ, often traveling long distances in this stage. In the last of June they assume the perfect form with wings, and it is then that they do incalculable damage. They are very active at night, and travel at a rate of from ten to fifteen miles a day.



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