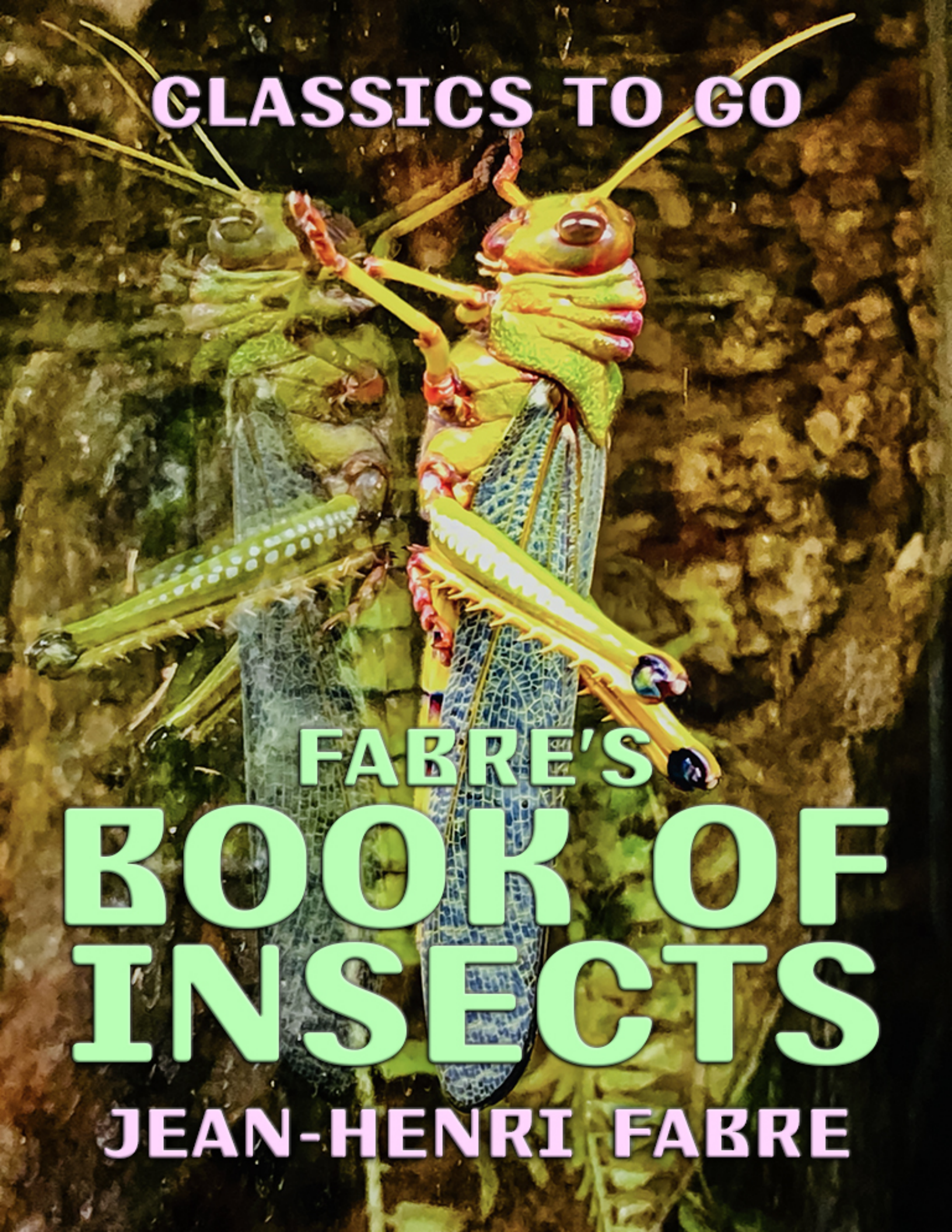
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THE SACRED BEETLE

Sometimes the Scarab seems to enter into partnership with a friend

LIST OF ILLUSTRATIONS

CHAPTER I

MY WORK AND MY WORKSHOP

We all have our own talents, our special gifts. Sometimes these gifts seem to come to us from our forefathers, but more often it is difficult to trace their origin.

A goatherd, perhaps, amuses himself by counting little pebbles and doing sums with them. He becomes an astoundingly quick reckoner, and in the end is a professor of mathematics. Another boy, at an age when most of us care only for play, leaves his schoolfellows at their games and listens to the imaginary sounds of an organ, a secret concert heard by him alone. He has a genius for music. A third—so small, perhaps, that he cannot eat his bread and jam without smearing his face—takes a keen delight in fashioning clay into little figures that are amazingly lifelike. If he be fortunate he will some day be a famous sculptor.

To talk about oneself is hateful, I know, but perhaps I may be allowed to do so for a moment, in order to introduce myself and my studies.

From my earliest childhood I have felt drawn towards the things of Nature. It would be ridiculous to suppose that this gift, this love of observing plants and insects, was inherited from my ancestors, who were uneducated people of the soil and observed little but their own cows and sheep. Of my four grandparents only one ever opened a book, and even he was very uncertain about his spelling. Nor do I owe

anything to a scientific training. Without masters, without guides, often without books, I have gone forward with one aim always before me: to add a few pages to the history of insects.

As I look back—so many years back!—I can see myself as a tiny boy, extremely proud of my first braces and of my attempts to learn the alphabet. And very well I remember the delight of finding my first bird's nest and gathering my first mushroom.

One day I was climbing a hill. At the top of it was a row of trees that had long interested me very much. From the little window at home I could see them against the sky, tossing before the wind or writhing madly in the snow, and I wished to have a closer view of them. It was a long climb —ever so long; and my legs were very short. I clambered up slowly and tediously, for the grassy slope was as steep as a roof.

Suddenly, at my feet, a lovely bird flew out from its hiding-place under a big stone. In a moment I had found the nest, which was made of hair and fine straw, and had six eggs laid side by side in it. The eggs were a magnificent azure blue, very bright. This was the first nest I ever found, the first of the many joys which the birds were to bring me. Overpowered with pleasure, I lay down on the grass and stared at it.

Meanwhile the mother-bird was flying about uneasily from stone to stone, crying "*Tack! Tack!*" in a voice of the greatest anxiety. I was too small to understand what she was suffering. I made a plan worthy of a little beast of prey. I would carry away just one of the pretty blue eggs as a trophy, and then, in a fortnight, I would come back and take the tiny birds before they could fly away. Fortunately, as I

walked carefully home, carrying my blue egg on a bed of moss, I met the priest.

“Ah!” said he. “A Saxicola’s egg! Where did you get it?”

I told him the whole story. “I shall go back for the others,” I said, “when the young birds have got their quill-feathers.”

“Oh, but you mustn’t do that!” cried the priest.

“You mustn’t be so cruel as to rob the poor mother of all her little birds. Be a good boy, now, and promise not to touch the nest.”

From this conversation I learnt two things: first, that robbing birds’ nests is cruel and, secondly, that birds and beasts have names just like ourselves.

“What are the names of all my friends in the woods and meadows?” I asked myself. “And what does *Saxicola* mean?” Years later I learnt that *Saxicola* means an inhabitant of the rocks. My bird with the blue eggs was a Stone-chat.

Below our village there ran a little brook, and beyond the brook was a spinney of beeches with smooth, straight trunks, like pillars. The ground was padded with moss. It was in this spinney that I picked my first mushroom, which looked, when I caught sight of it, like an egg dropped on the moss by some wandering hen. There were many others there, of different sizes, forms, and colours. Some were shaped like bells, some like extinguishers, some like cups: some were broken, and were weeping tears of milk: some became blue when I trod on them. Others, the most curious of all, were like pears with a round hole at the top—a sort of chimney whence a whiff of smoke escaped when I prodded their under-side with my finger. I filled my pockets

with these, and made them smoke at my leisure, till at last they were reduced to a kind of tinder.

Many a time I returned to that delightful spinney, and learnt my first lessons in mushroom-lore in the company of the Crows. My collections, I need hardly say, were not admitted to the house.

In this way—by observing Nature and making experiments—nearly all my lessons have been learnt: all except two, in fact. I have received from others two lessons of a scientific character, and two only, in the whole course of my life: one in anatomy and one in chemistry.

I owe the first to the learned naturalist Moquin-Tandon, who showed me how to explore the interior of a Snail in a plate filled with water. The lesson was short and fruitful.[1]

My first introduction to chemistry was less fortunate. It ended in the bursting of a glass vessel, with the result that most of my fellow-pupils were hurt, one of them nearly lost his sight, the lecturer's clothes were burnt to pieces, and the wall of the lecture-room was splashed with stains. Later on, when I returned to that room, no longer as a pupil but as a master, the splashes were still there. On that occasion I learnt one thing at least. Ever after, when I made experiments of that kind, I kept my pupils at a distance.

It has always been my great desire to have a laboratory in the open fields—not an easy thing to obtain when one lives in a state of constant anxiety about one's daily bread. For forty years it was my dream to own a little bit of land, fenced in for the sake of privacy: a desolate, barren, sun-scorched bit of land, overgrown with thistles and much beloved by Wasps and Bees. Here, without fear of interruption, I might question the Hunting-wasps and

others of my friends in that difficult language which consists of experiments and observations. Here, without the long expeditions and rambles that use up my time and strength, I might watch my insects at every hour of the day.

And then, at last, my wish was fulfilled. I obtained a bit of land in the solitude of a little village. It was a *harmas*, which is the name we give in this part of Provence to an untilled, pebbly expanse where hardly any plant but thyme can grow. It is too poor to be worth the trouble of ploughing, but the sheep pass there in spring, when it has chanced to rain and a little grass grows up.

My own particular *harmas*, however, had a small quantity of red earth mixed with the stones, and had been roughly cultivated. I was told that vines once grew here, and I was sorry, for the original vegetation had been driven out by the three-pronged fork. There was no thyme left, nor lavender, nor a single clump of the dwarf oak. As thyme and lavender might be useful to me as a hunting-ground for Bees and Wasps, I was obliged to plant them again.

There were plenty of weeds: couch-grass, and prickly centauries, and the fierce Spanish oyster-plant, with its spreading orange flowers and spikes strong as nails. Above it towered the Illyrian cotton-thistle, whose straight and solitary stalk grows sometimes to the height of six feet and ends in large pink tufts. There were smaller thistles too, so well armed that the plant-collector can hardly tell where to grasp them, and spiky knapweeds, and in among them, in long lines provided with hooks, the shoots of the blue dewberry creeping along the ground. If you had visited this prickly thicket without wearing high boots, you would have paid dearly for your rashness!

Such was the Eden that I won by forty years of desperate struggle.

This curious, barren Paradise of mine is the happy hunting-ground of countless Bees and Wasps. Never have I seen so large a population of insects at a single spot. All the trades have made it their centre. Here come hunters of every kind of game, builders in clay, cotton-weavers, leaf-cutters, architects in pasteboard, plasterers mixing mortar, carpenters boring wood, miners digging underground galleries, workers in gold-beaters' skin, and many more.

See—here is a Tailor-bee. She scrapes the cobwebby stalk of the yellow-flowered centaury, and gathers a ball of wadding which she carries off proudly with her mandibles or jaws. She will turn it, underground, into cotton satchels to hold the store of honey and the eggs. And here are the Leaf-cutting Bees, carrying their black, white, or blood-red reaping brushes under their bodies. They will visit the neighbouring shrubs, and there cut from the leaves oval pieces in which to wrap their harvest. Here too are the black, velvet-clad Mason-bees, who work with cement and gravel. We could easily find specimens of their masonry on the stones in the *harmas*. Next comes a kind of Wild Bee who stacks her cells in the winding staircase of an empty snail-shell; and another who lodges her grubs in the pith of a dry bramble-stalk; and a third who uses the channel of a cut reed; and a fourth who lives rent-free in the vacant galleries of some Mason-bee. There are also Bees with horns, and Bees with brushes on their hind-legs, to be used for reaping.

While the walls of my *harmas* were being built some great heaps of stones and mounds of sand were scattered here and there by the builders, and were soon occupied by a variety of inhabitants. The Mason-bees chose the chinks

between the stones for their sleeping-place. The powerful Eyed Lizard, who, when hard pressed, attacks both man and dog, selected a cave in which to lie in wait for the passing Scarab, or Sacred Beetle. The Black-eared Chat, who looks like a Dominican monk in his white-and-black raiment, sat on the top stone singing his brief song. His nest, with the sky-blue eggs, must have been somewhere in the heap. When the stones were moved the little Dominican moved too. I regret him: he would have been a charming neighbour. The Eyed Lizard I do not regret at all.

The sand-heaps sheltered a colony of Digger-wasps and Hunting-wasps, who were, to my sorrow, turned out at last by the builders. But still there are hunters left: some who flutter about in search of Caterpillars, and one very large kind of Wasp who actually has the courage to hunt the Tarantula. Many of these mighty Spiders have their burrows in the *harmas*, and you can see their eyes gleaming at the bottom of the den like little diamonds. On hot summer afternoons you may also see Amazon-ants, who leave their barracks in long battalions and march far afield to hunt for slaves.

Nor are these all. The shrubs about the house are full of birds, Warblers and Greenfinches, Sparrows and Owls; while the pond is so popular with the Frogs that in May it becomes a deafening orchestra. And boldest of all, the Wasp has taken possession of the house itself. On my doorway lives the White-banded Sphex: when I go indoors I must be careful not to tread upon her as she carries on her work of mining. Just within a closed window a kind of Mason-wasp has made her earth-built nest upon the freestone wall. To enter her home she uses a little hole left by accident in the shutters. On the mouldings of the Venetian blinds a few stray Mason-bees build their cells. The Common Wasp and the Solitary Wasp visit me at

dinner. The object of their visit, apparently, is to see if my grapes are ripe.

Such are my companions. My dear beasts, my friends of former days and other more recent acquaintances, are all here, hunting, and building, and feeding their families. And if I wish for change the mountain is close to me, with its tangle of arbutus, and rock-roses, and heather, where Wasps and Bees delight to gather. And that is why I deserted the town for the village, and came to Sérignan to weed my turnips and water my lettuces.

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1 See Insect Adventures, retold for young people from the works of Henri Fabre. ↑

CHAPTER II

THE SACRED BEETLE

I

THE BALL

It is six or seven thousand years since the Sacred Beetle was first talked about. The peasant of ancient Egypt, as he watered his patch of onions in the spring, would see from time to time a fat black insect pass close by, hurriedly trundling a ball backwards. He would watch the queer rolling thing in amazement, as the peasant of Provence watches it to this day.

The early Egyptians fancied that this ball was a symbol of the earth, and that all the Scarab's actions were prompted by the movements of the heavenly bodies. So much knowledge of astronomy in a Beetle seemed to them almost divine, and that is why he is called the Sacred Beetle. They also thought that the ball he rolled on the ground contained the egg, and that the young Beetle came out of it. But as a matter of fact, it is simply his store of food.

It is not at all nice food. For the work of this Beetle is to scour the filth from the surface of the soil. The ball he rolls so carefully is made of his sweepings from the roads and fields.

This is how he sets about it. The edge of his broad, flat head is notched with six teeth arranged in a semi-circle, like a sort of curved rake; and this he uses for digging and cutting up, for throwing aside the stuff he does not want, and scraping together the food he chooses. His bow-shaped fore-legs are also useful tools, for they are very strong, and they too have five teeth on the outside. So if a vigorous effort be needed to remove some obstacle the Scarab makes use of his elbows, that is to say he flings his toothed legs to right and left, and clears a space with an energetic sweep. Then he collects armfuls of the stuff he has raked together, and pushes it beneath him, between the four hinder-legs. These are long and slender, especially the last pair, slightly bowed and finished with a sharp claw. The Beetle then presses the stuff against his body with his hind-legs, curving it and spinning it round and round till it forms a perfect ball. In a moment a tiny pellet grows to the size of a walnut, and soon to that of an apple. I have seen some gluttons manufacture a ball as big as a man’s fist.

When the ball of provisions is ready it must be moved to a suitable place. The Beetle begins the journey. He clasps the ball with his long hind-legs and walks with his fore-legs, moving backwards with his head down and his hind-quarters in the air. He pushes his load behind him by alternate thrusts to right and left. One would expect him to choose a level road, or at least a gentle incline. Not at all! Let him find himself near some steep slope, impossible to climb, and that is the very path the obstinate creature will attempt. The ball, that enormous burden, is painfully hoisted step by step, with infinite precautions, to a certain height, always backwards. Then by some rash movement all this toil is wasted: the ball rolls down, dragging the Beetle with it.

Once more the heights are climbed, and another fall is the result. Again and again the insect begins the ascent. The merest trifle ruins everything; a grass-root may trip him up or a smooth bit of gravel make him slip, and down come ball and Beetle, all mixed up together. Ten or twenty times he will start afresh, till at last he is successful, or else sees the hopelessness of his efforts and resigns himself to taking the level road.

Sometimes the Scarab seems to enter into partnership with a friend. This is the way in which it usually happens. When the Beetle's ball is ready he leaves the crowd of workers, pushing his prize backwards. A neighbour, whose own task is hardly begun, suddenly drops his work and runs to the moving ball, to lend a hand to the owner. His aid seems to be accepted willingly. But the new-comer is not really a partner: he is a robber. To make one's own ball needs hard work and patience; to steal one ready-made, or to invite oneself to a neighbour's dinner, is much easier. Some thieving Beetles go to work craftily, others use violence.

Sometimes a thief comes flying up, knocks over the owner of the ball, and perches himself on top of it. With his fore-legs crossed over his breast, ready to hit out, he awaits events. If the owner raises himself to seize his ball the robber gives him a blow that stretches him on his back. Then the owner gets up and shakes the ball till it begins rolling, and perhaps the thief falls off. A wrestling-match follows. The two Beetles grapple with one another: their legs lock and unlock, their joints intertwine, their horny armour clashes and grates with the rasping sound of metal under a file. The one who is successful climbs to the top of the ball, and after two or three attempts to dislodge him the defeated Scarab goes off to make himself a new pellet.

I have sometimes seen a third Beetle appear, and rob the robber.

But sometimes the thief bides his time and trusts to cunning. He pretends to help the victim to roll the food along, over sandy plains thick with thyme, over cart-ruts and steep places, but he really does very little of the work, preferring to sit on the ball and do nothing. When a suitable place for a burrow is reached the rightful owner begins to dig with his sharp-edged forehead and toothed legs, flinging armfuls of sand behind him, while the thief clings to the ball, shamming dead. The cave grows deeper and deeper, and the working Scarab disappears from view. Whenever he comes to the surface he glances at the ball, on which the other lies, demure and motionless, inspiring confidence. But as the absences of the owner become longer the thief seizes his chance, and hurriedly makes off with the ball, which he pushes behind him with the speed of a pickpocket afraid of being caught. If the owner catches him, as sometimes happens, he quickly changes his position, and seems to plead as an excuse that the pellet rolled down the slope, and he was only trying to stop it! And the two bring the ball back as though nothing had happened.

If the thief has managed to get safely away, however, the owner can only resign himself to his loss, which he does with admirable fortitude. He rubs his cheeks, sniffs the air, flies off, and begins his work all over again. I admire and envy his character.

At last his provisions are safely stored. His burrow is a shallow hole about the size of a man’s fist, dug in soft earth or sand, with a short passage to the surface, just wide enough to admit the ball. As soon as his food is

rolled into this burrow the Scarab shuts himself in by stopping up the entrance with rubbish. The ball fills almost the whole room: the banquet rises from floor to ceiling. Only a narrow passage runs between it and the walls, and here sit the banqueters, two at most, very often only one. Here the Sacred Beetle feasts day and night, for a week or a fortnight at a time, without ceasing.

II

THE PEAR

As I have already said, the ancient Egyptians thought that the egg of the Sacred Beetle was within the ball that I have been describing. I have proved that it is not so. One day I discovered the truth about the Scarab's egg.

A young shepherd who helps me in his spare time came to me one Sunday in June with a queer thing in his hand. It was exactly like a tiny pear that had lost all its fresh colour and had turned brown in rotting. It was firm to the touch and very graceful in shape, though the materials of which it was formed seemed none too nicely chosen. The shepherd assured me there was an egg inside it; for a similar pear, crushed by accident in the digging, had contained a white egg the size of a grain of wheat.

At daybreak the next morning the shepherd and I went out to investigate the matter. We met among the browsing sheep, on some slopes that had lately been cleared of trees.

A Sacred Beetle's burrow is soon found: you can tell it by the fresh little mound of earth above it. My companion dug vigorously into the ground with my pocket trowel, while I lay down, the better to see what was being unearthed. A

cave opened out, and there I saw, lying in the moist earth, a splendid pear upon the ground. I shall not soon forget my first sight of the mother Beetle's wonderful work. My excitement could have been no greater had I, in digging among the relics of ancient Egypt, found the sacred insect carved in emerald.

We went on with our search, and found a second hole. Here, by the side of the pear and fondly embracing it, was the mother Beetle, engaged no doubt in giving it the finishing touches before leaving the burrow for good. There was no possible doubt that the pear was the nest of the Scarab. In the course of the summer I found at least a hundred such nests.

The pear, like the ball, is formed of refuse scraped up in the fields, but the materials are less coarse, because they are intended for the food of the grub. When it comes out of the egg it is incapable of searching for its own meals, so the mother arranges that it shall find itself surrounded by the food that suits it best. It can begin eating at once, without further trouble.

The egg is laid in the narrow end of the pear. Every germ of life, whether of plant or animal, needs air: even the shell of a bird's egg is riddled with an endless number of pores. If the germ of the Scarab were in the thick part of the pear it would be smothered, because there the materials are very closely packed, and are covered with a hard rind. So the mother Beetle prepares a nice airy room with thin walls for her little grub to live in, during its first moments. There is a certain amount of air even in the very centre of the pear, but not enough for a delicate baby-grub. By the time he has eaten his way to the centre he is strong enough to manage with very little air.

There is, of course, a good reason for the hardness of the shell that covers the big end of the pear. The Scarab's burrow is extremely hot: sometimes the temperature reaches boiling point. The provisions, even though they have to last only three or four weeks, are liable to dry up and become uneatable. When, instead of the soft food of its first meal, the unhappy grub finds nothing to eat but horrible crusty stuff as hard as a pebble, it is bound to die of hunger. I have found numbers of these victims of the August sun. The poor things are baked in a sort of closed oven. To lessen this danger the mother Beetle compresses the outer layer of the pear—or nest—with all the strength of her stout, flat fore-arms, to turn it into a protecting rind like the shell of a nut. This helps to ward off the heat. In the hot summer months the housewife puts her bread into a closed pan to keep it fresh. The insect does the same in its own fashion: by dint of pressure it covers the family bread with a pan.

I have watched the Sacred Beetle at work in her den, so I know how she makes her pear-shaped nest.

With the building-materials she has collected she shuts herself up underground so as to give her whole attention to the business in hand. The materials may be obtained in two ways. As a rule, under natural conditions, she kneads a ball in the usual way and rolls it to a favourable spot. As it rolls along it hardens a little on the surface and gathers a slight crust of earth and tiny grains of sand, which is useful later on. Now and then, however, the Beetle finds a suitable place for her burrow quite close to the spot where she collects her building-materials, and in that case she simply bundles armfuls of stuff into the hole. The result is most striking. One day I see a shapeless lump disappear into the burrow. Next day, or the day after, I visit the Beetle's workshop and find the artist in front of her work. The

formless mass of scrapings has become a pear, perfect in outline and exquisitely finished.

The part that rests on the floor of the burrow is crusted over with particles of sand, while the rest is polished like glass. This shows that the Beetle has not rolled the pear round and round, but has shaped it where it lies. She has modelled it with little taps of her broad feet, just as she models her ball in the daylight.

By making an artificial burrow for the mother Beetle in my own workshop, with the help of a glass jar full of earth, and a peep-hole through which I can observe operations, I have been able to see the work in its various stages.

The Beetle first makes a complete ball. Then she starts the neck of the pear by making a ring round the ball and applying pressure, till the ring becomes a groove. In this way a blunt projection is pushed out at one side of the ball. In the centre of this projection she employs further pressure to form a sort of crater or hollow, with a swollen rim; and gradually the hollow is made deeper and the swollen rim thinner and thinner, till a sack is formed. In this sack, which is polished and glazed inside, the egg is laid. The opening of the sack, or extreme end of the pear, is then closed with a plug of stringy fibres.

There is a reason for this rough plug—a most curious exception, when nothing else has escaped the heavy blows of the insect’s leg. The end of the egg rests against it, and, if the stopper were pressed down and driven in, the infant grub might suffer. So the Beetle stops the hole without ramming down the stopper.

III

THE GROWING-UP OF THE SCARAB

About a week or ten days after the laying of the egg, the grub is hatched, and without delay begins to eat its house. It is a grub of remarkable wisdom, for it always starts its meal with the thickest part of the walls, and so avoids making a hole through which it might fall out of the pear altogether. It soon becomes fat; and indeed it is an ungainly creature at best, with an enormous hump on its back, and a skin so transparent that if you hold it up to the light you can see its internal organs. If the early Egyptian had chanced upon this plump white grub he would never have suspected it to contain, in an undeveloped state, the sober beauty of the Scarab!

When first it sheds its skin the insect that appears is not a full-grown Scarab, though all the Scarab's features can be recognised. There are few insects so beautiful as this delicate creature with its wing-cases living in front of it like a wide pleated scarf and its fore-legs folded under its head. Half transparent and as yellow as honey, it looks as though it were carved from a block of amber. For four weeks it remains in this state, and then it too casts its skin.

Its colouring now is red-and-white,—so many times does the Sacred Beetle change its garments before it finally appears black as ebony! As it grows blacker it also grows harder, till it is covered with horny armour and is a full-grown Beetle.

All this time he is underground, in the pear-shaped nest. Great is his longing to burst the shell of his prison and come into the sunshine. Whether he succeeds in doing so depends on circumstances.

It is generally August when he is ready for release, and August as a rule is the driest and hottest month of the year. If therefore no rain falls to soften the earth, the cell to be burst and the wall to be broken defy the strength of the insect, which is helpless against all that hardness. The soft material of the nest has become an impassable rampart; it has turned into a sort of brick, baked in the kiln of summer.

I have, of course, made experiments on insects that are ready to be released. I lay the hard, dry shells in a box where they remain dry; and sooner or later I hear a sharp, grating sound inside each cell. It is the prisoner scraping the wall with the rakes on his forehead and his fore-feet. Two or three days pass, and no progress seems to have been made.

I try to help a couple of them by opening a loophole with my knife; but these favoured ones make no more progress than the others.

In less than a fortnight silence reigns in all the shells. The prisoners, worn out with their efforts, have all died.

Then I take some other shells, as hard as the first, wrap them in a wet rag, and put them in a corked flask. When the moisture has soaked through them I rid them of the wrapper, but keep them in the flask. This time the experiment is a complete success. Softened by the wet the shells are burst by the prisoner, who props himself boldly on his legs, using his back as a lever, or else scrapes away at one point till the walls crumble to pieces. In every case the Beetle is released.

In natural conditions, when the shells remain underground, the same thing occurs. When the soil is burnt by the August sun it is impossible for the insect to wear away his prison,