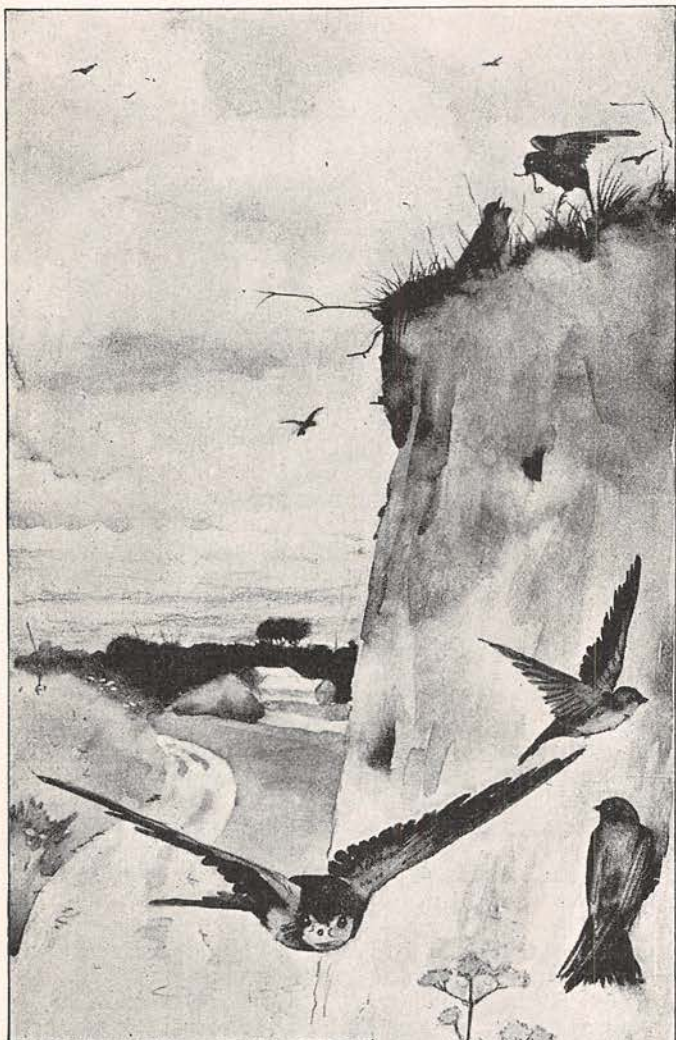


**S**TROLLING across the moor in the sunshine to-day, past the lonely pine where the night-jar sits crooning to his lady-love in the twilight, I came suddenly across his grey mate herself, and saw her flutter up sleepily in dazed surprise from the bare ground where she was sitting. As she flapped her mottled wings and sailed slowly away, like a blinking owl disturbed in the daytime, I noticed that I had lighted unawares upon her nest, or, rather, her eggs, for she lays them on the open, without bed of any sort. I left them untouched, for I am no collector. A few minutes later, I came abreast of the low cliff where the sand-martins have established their twittering colony. The soft yellow sandstone that forms the cutting is honeycombed with their tunnels; and as I leaned on my stick and looked, I saw the busy brown birds gliding in and out, with their long curved flight, and carrying back mouthfuls of gnats and mayflies to their fledglings in the burrows. It was beautiful to watch them swooping in great arcs over the gorse and bracken, and then darting straight with unerring accuracy to the mouth of their tunnels. They alight at the very door with all the skill of born pilots, never missing or overshooting the mark by one inch, but steering upon it so truly that they look as though failure or miscalculation were impossible.

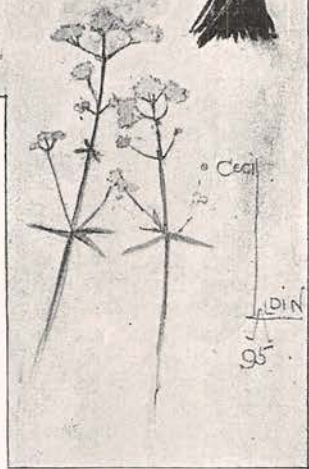
These two little episodes coming together set me thinking; 'tis a bad habit one indulges when one walks too much alone in the open. In towns one doesn't think, because the shop-windows, and the horses, and the noise, and the people, and the omnibuses distract one, but in the country, one gives way a great deal too readily to what Plato calls the "divine disease" of thinking. I began to philosophise. How curious, I said to myself, that we have but five kinds of bird in England that hawk on the wing after insects in the open; and of all those five, not one builds a proper respectable nest, woven of twigs and straws, like a sparrow or a robin! Every one of them has some peculiar little fancy of his own—goes in for some individual freak of originality. The night-jar, which is the simplest and earliest in type of the group, lays its eggs on the bare ground, and rises superior in its Spartan simplicity to such petty luxuries as beds and bedding. The swift, that ecclesiologically minded bird, which loves the chief seats in the synagogue, the highest pinnacles of tower or steeple, gums together a soft nest of floating thistledown and feathers, by means of a sticky secretion from its own mouth, distilled in the last resort from the juices of insects. The swallow and the house-martin, again, make domed mud huts, and line them inside with soft floating materials. Finally, the sand-martin excavates with its bill the soft sandstone of cliffs or roadside cuttings, and strews a bed within for its callow young of cotton-grass and dandelion parachutes.

Why this curious variety among themselves, and this equally curious divergence from the common practice of bird-kind in general? Clearly, thought I, it must bear some definite relation to the habits and manners of the birds which exhibit it. Let me think what it means. Aha, aha,





eureka! I have found it! The insect-hawking birds are not a natural group; by descent they have nothing at all to do with one another. Closely as the swift resembles the swallow in form, in flight, in shape of bill, in habits and manners, we now know that the swift is a specialised woodpecker, while the swallow and the martins are specialised sparrows. (I use both words, *bien entendu*, in quite their widest and most Pickwickian evolutionary acceptance.) The swift and the night-jar belong to one great family of birds; the swallow, the house-martin, and the sand-martin to another.



The likeness in form and in mode of flight has been brought about by similarity in their style of living. Two different birds of two different types both took, ages since, to hawking after flies and midges in the open air. Each group was thus compelled to acquire long and powerful wings, a light and airy body, a good steering tail, a wide gape of mouth, and a rapid curved flight, so as to swoop down upon and catch its petty prey unsuspected. So, in the long run, the two types which hawk most in the open, the swifts and the swallows, have grown so like that only by minute anatomical differences can we refer the remoter ancestry of one species to the woodpeckers and humming-birds, and the remoter ancestry of the other to the tits and sparrows.

How does their manner of life affect their mode of nesting, however? Indirectly, in this way. Birds that live largely off seeds and fruits and hard-shelled beetles have hard short beaks to grind their food with, and sit much in thickets, scrub, or hedgerows. But birds that hawk on the wing after small soft flies must have wide soft bills, and a gaping mouth; they can hardly perch at all on trees or bushes, and their feet are too weak to be of much use for walking. Indeed, if a swift once alights on the ground, he can scarcely get up again, so difficult is it for the long wings to work in a



narrow space, and so slight a power of jumping have the feeble little legs. Hence it follows that birds of the hedge-row type can readily build nests of twigs and straws, which they gather as they perch, or seek on the ground; and they are enabled to weave them with their hard bills and active feet; while birds of the hawking type cannot pick up sticks or gather straws on the ground, and have beaks quite unadapted for dealing with such intractable materials. The consequence is they have been compelled to find out each some new plan for itself, and to build their nest out of such stray material as their habits permit them.

The night-jar, a stranded nocturnal bird of early type, with very few modern improvements and additions, solves the problem in the easiest and rudest way by simply going without a nest at all, and laying her eggs unprotected on the open. Nocturnal creatures, indeed, are to a great extent the losers in the struggle for existence: they always retain many early and uncivilised ways, if I may speak metaphorically. They are the analogues of the street arabs who sleep in Trafalgar Square under shelter of a newspaper. The sand-martin, an earlier type than the swallow or the house-martin, burrows in sandstone cliffs, which are pre-human features, though man's roads and railways have largely extended his field of enterprise. But the house-martin and the swallow, later and far more civilised developments, have learned to take advantage of our barns and houses; they nest under the eaves; and being largely water-haunters, skimming lightly over the surface of ponds and lakes, they have naturally taken advantage of the mud at the edges as a convenient building material. Last of all, the soaring swift, the most absolutely aerial type of the entire group, unable to alight on the ground at all, has acquired the habit of catching cottony seeds, and thistledown, and floating feathers in his mouth as he flies, and gumming them together into a mucilaginous nest with his own saliva. The Oriental sea-swifts have no chance of finding even such flying materials among their caves and cliffs, and they have consequently been driven into erecting nests entirely of their own inspissated saliva without any basis of down or feathers. These are the famous edible birds'-nests of the Chinese; they look like gelatine, and they make excellent soup, somewhat thick and gummy.

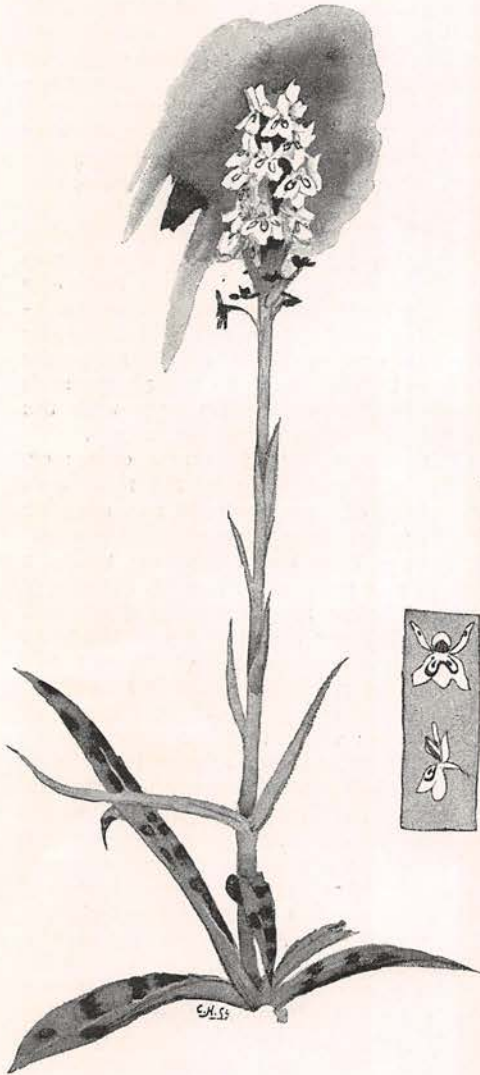
#### A SPOTTED ORCHIS.

Like Mr. Chamberlain, I too am an orchid-grower. I own three acres (without a cow) on a heather-clad hilltop, and no small proportion of that landed estate is "down under orchids." Not that I mean to say the species I cultivate, or rather allow to grow wild, on my wild little plot would excite the envy of the magnate of Highbury. They are nothing more than common English spotted orchids, springing free and spontaneous among the gorse and heather; but, oh! how beautiful they are! how much more beautiful than the dendrobiums and cattleyas, the flowering spiders and blossoming lizards of the rich man's hothouse! How proudly they raise their tall spikes of pale bloom, true sultanas of the moorland! how daintily they woo the big burly bumble bees! how gracefully they bend their nodding heads before the bold south-west that careers across the country! They seem to me always such great regal flowers, yet simple with the simplicity of the untrodden upland.

Take a spike and look at it close; or, better still, grub it up by the roots with the point of your umbrella, and examine it all through from its foundation upward. It springs from two tubers, not unlike a pair of new potatoes to look at, but deeply divided below into finger-like processes. Those divisions it was that gave the plant its quaint old English title of "dead men's fingers"—for, indeed, there is something clammy and corpse-like about the feel of the tubers; while that "coarser name" to which Shakspeare alludes in passing is due to their general shape, and is still enshrined in the Greek word "orchid" which everybody now applies to them without thinking for a moment of its unsavoury meaning. But the two tubers are not of the same age. One is old and wilted; the other is young and fresh and, as the advertisements say, "still growing." The first is last year's reserve fund for this year's flowering stem; the second is this year's storehouse of food for next year's blossom. Thus each season depends for its flowers upon the previous year's income; the leaves, which are the mouths and stomachs of the plants, lay by material in due season; and the spike of bells proceeds from the tubers or consolidated reserve fund as soon as the summer is sufficiently advanced for the process of flowering. Few plants with handsome heads or trusses of bloom, indeed, can afford to produce them upon the current season's income; therefore you will find that most large-flowered forms, like lilies,



tulips, hyacinths, and daffodils, if they wish to blossom early in the year, depend for their food-supply upon a bulb or tuber of last season's making. Only in the orchids, however, do you find this curious device of a pair of tubers at once side by side,



one being filled and fed, while the other is being slowly devoured and depleted. By the end of the season the new tuber is rich and full to bursting, while the old one is withered, flaccid, and empty.

From the tuber, in early spring, start the pretty lance-shaped leaves—green, dappled with leopard spots of some deep brown pigment. The use and meaning of these beautiful spots on the glossy green foliage no one has yet deciphered;

it remains as one of the ten thousand insoluble mysteries of plant existence. That is always so in life. We tell what we know; but what we know not, who shall count it or number it? Yet the flowers, after all, are the true centre of interest in the English orchid. Thirty of them in a spike, pale lilac or white, all starred and brocaded with strange flecks of purple, they rank among the most marvellous of our native flowers in shape and structure. The long spur at the back is the factory and reservoir for the abundant honey; the face of the blossom consists of a broad and showy lip, the flaunting advertisement to bee or butterfly of the sweets within; it is flanked by two slender spreading wings, above which a third sepal arches over the helmet-like petals. Beneath this hood or dome, in the centre of the column, the club-shaped pollen-masses lie half concealed in two pockets, or pouches—dainty little purses, as it were, like fairy wallets, slit open in front for the bee's convenience. The base of the pollen-masses is sticky or gummy; and they are so arranged, of set purpose, in their pouches that the moment the bee's head touches them, they cling to it automatically, by their gummy end, and are carried off without his knowledge or consent to the next flower he visits. But if you want to see exactly how this pretty little drama of plant life is enacted, you need not wait, as I have often done, silent on the heath for half an hour together, till some blustering bumble bee bustles in, all importance. It suffices for demonstration just to pick a spike and insert into the mouth of the honey-spur a stem of grass, which does duty for the bee's head and proboscis, when straightway "the figures will act," as they say on the penny-in-the slot machines, and the pollen-masses will gum themselves by automatic action to the imaginary insect.

The reason for this curious and highly advanced device is that orchids are among the plants most absolutely specialised for insect-fertilisation. Most species of orchid, in fact, can never set their seeds at all without the intervention of these flying "marriage priests," as Darwin quaintly called them. If left to themselves the flowers must wither on their virgin thorn unwed and no seed be set in the twisted ovary. But when the bee goes to them in search of honey, the pollen-masses gum themselves to the front of his head, though just at first they point upward and inward. Then, after a short time, as he flies through the air, they contract in drying, and so



point forward, in the direction in which he will enter the next flower he visits. This brings the pollen directly into contact with the sensitive cushion or pad of the ovary in the flower so visited, and thus results in the desired cross-fertilisation. For the ovary, too, is gummy, to make the pollen stick to it.

A roundabout way, you think, to arrive after all at so simple a conclusion? Well, that is the habit of Nature. And again, bethink you, good, easy-going human being, how great are the difficulties she has to contend with, especially in the case of the plant creation. Put yourself in the orchid's place, and you will see the reason. For remember how absolutely fixed and limited are plants, each rooted to the soil in a single small spot, each tied by strict conditions of rock, and water-supply, and air, and wind, and sun, and climate, from which none can escape, try they all their hardest. The opposite sides of a road are to them as the two poles, one with a sunny and southward-looking bank, the other with a cold and forbidding northern aspect; so that what flourishes apace on the first would shiver and die of chill winds on the second. Remember, too, that save in the mildest degree, plants have no power of spontaneous or independent movement: they cannot stir from their birthplace, were it but for a single inch, nor move their own limbs save as the wind may sway them. Creatures thus narrowly and inevitably bound down must needs take advantage of the power of movement in all other kinds, wherever it will benefit them. Hence the use plants make of insects as common carriers of pollen, the use they make of birds as dispersers of seeds, the use they make of natural agencies, such as wind or stream, to waft winged thistle-down, to carry the parachutes of the dandelion and the willow, or to float the male blossoms of such water-weeds as *vallisneria*. Behold! I show you a mystery. The secret of the whole thing is that plants, being fixed themselves, must needs employ birds and insects as their Pickford vans—must rely on wind or stream for such casual services as wind or stream can easily afford them. Only in a few species can they effect anything like active movement for themselves, as one sees in the rooting runners of strawberries, or the wandering tubers of certain vagrant orchids, which spread far afield from last season's nesting-place. These are clever devices for securing fresh virgin soil—"rotation of crops," as the farmers put it.

#### THE DEVIL'S PUNCHBOWL.

On Sunday the boys came home for their half-term holiday, so we strolled in the morning into the Devil's Punchbowl. That is the name of the basin-shaped valley that lies behind the house—a deep circular glen scooped out in a softer portion of the sandstone mass that forms the moor, by rain and denudation. Thor owned it, I doubt not, long before it was claimed by its present possessor, for the parish is Thursley; and some Celtic god, whose name is only known to Professor Rhys, may have used it as his drinking-cup long before the Norseman brought his Thor, or the Saxon his Thunor, into the Surrey uplands. But the Devil is now the heir-general and residuary legatee of all heathen gods deceased, be they late or early: he has come into titular ownership of their entire property. A steep path leads zigzag down the side of the escarpment into the bowl-shaped hollow; at its bottom a tiny stream oozes out in a spring as limpid as *Bandusia*. Water lies in the rock, indeed, at about two hundred and fifty feet below the surface of the moor, to which depth we have, accordingly, to sink our wells on the hilltop; and it is at about the same level that the springs gush forth which form the headwaters of our local rivers.

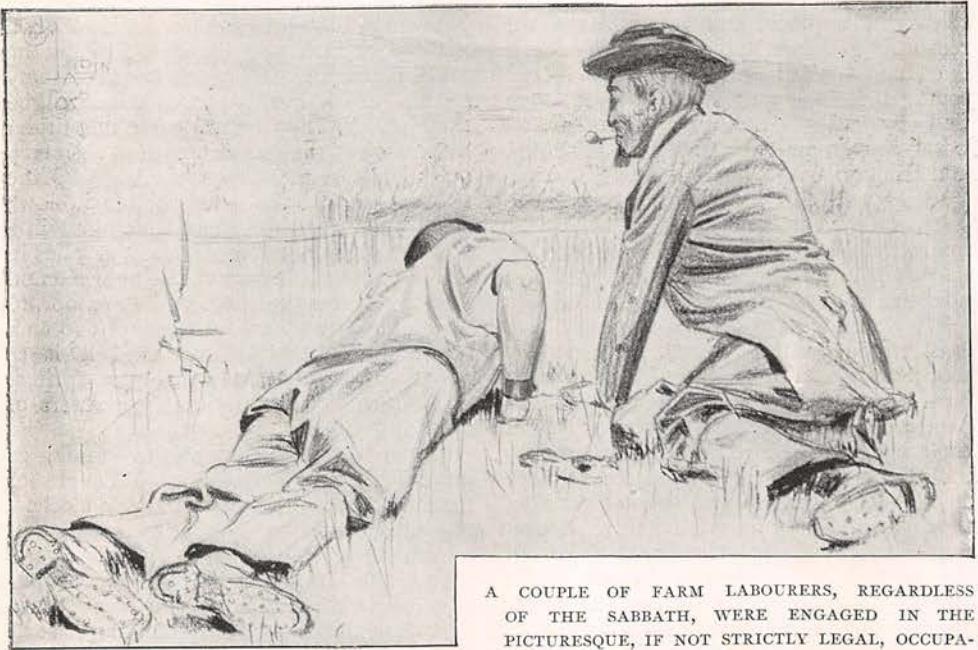
When we came upon the brook, as good luck would have it, a couple of farm labourers in their workaday clothes, regardless of the Sabbath, lay at full length upon the bank, engaged in the picturesque, if not strictly legal, occupation of tickling trout. The boys were of course delighted; they had never seen the operation performed before, and were charmed at its almost mesmeric magic. At first the men, seeing gentefolk approach, regarded us with disfavour as their natural enemies, no doubt in league with the preserving landlord; but as soon as they discovered we were "the right sort," in full sympathy with the fine old poaching proclivities of the upland population, they returned forthwith to their tickling with a zest, and landed a couple of trout, not to mention a crayfish, before the very eyes of the delighted schoolboys.

Tickling trout is an ancient and honourable form of sport, which admits of much skill and address in the tickler. The fish lurk quietly under overhanging banks where an undermined green sod impends the tiny stream; and the operator passes his hand gently over their sides once or twice till he has established confidence; then, taking advantage of the friendship



thus formed, he suddenly closes his hand and whips the astonished victim unawares out of the water. It has been urged by anglers (who are interested parties) that such conduct contains an element of treachery; but all is fair in love and war, of which last our contest with the wild creatures of nature is but a minor variety; and I cannot see that it matters much, ethically, whether you land your trout on the bank under pretence of titillating his sense of touch or treacherously hook him

isolated colony of its own, composed of many dozen kinds of fish, insects, and crustaceans, who know no more of other members of their race than the people on a small Pacific island knew of the human family before Captain Cook burst upon them from the blue, with the blessings of Christianity, rum, and extermination. These trout, for example, are a group apart; they are always small, even when adult, because there is little food for them; and the stream is little. In big rivers,



A COUPLE OF FARM LABOURERS, REGARDLESS OF THE SABBATH, WERE ENGAGED IN THE PICTURESQUE, IF NOT STRICTLY LEGAL, OCCUPATION OF TICKLING TROUT.

by false show of supplying him with a dainty dinner. Indeed, all the trout I have interviewed on the subject are unanimously of opinion that, if you must be caught and eaten at all, they had rather be caught by a gentle pressure of the naked hand than have their mouths and feelings cruelly lacerated by a barbed hook disguised as a mayfly. Which reminds me of the charming French apologue of the farmer who called his turkeys together in order to ask them with what sauce they would prefer to be eaten. "Please your Excellency," said the turkeys, "we don't want to be eaten at all." "My friends," said the farmer, "you wander from the question."

It is curious, though, to see how this mere thread of water supports a whole

where there is space to turn, and provisions are plentiful, a successful trout of the selfsame species runs to five or six pounds, while the very near variety which frequents great lakes not infrequently grows to forty-five or fifty. But here, in this upland rill, an ounce or two is the limit. They live mostly in pairs, like well-conducted fish, one couple to each pool or overhung basin; yet, strange to say, if one is tickled or otherwise enticed away, the widowed survivor seems always to have found a mate before three hours are over. I know most of them personally, and love to watch their habits and manners. They are brilliantly speckled here, because the water is clear and the bottom pebbly; for the spots on trout depend on the bed, and come out brighter



and more ornamental by far during the breeding season. This is still more conspicuously the case with the æsthetic stickleback, the dandy of the fresh waters; he puts on the most exquisite iridescent hues when he goes a-courting, and exhibits himself to his mate more gorgeously clad than Solomon in all his glory. Unfortunately, the colours are very fugacious, for they die away at once when he is taken from the water; but while they last they outshine in brilliancy the humming-bird or the butterfly. Both species are great and determined fighters, as always happens with brilliantly decorated birds, fishes, reptiles, and insects. None but the brave deserve the fair; and bravery and æsthetic taste seem to go together. Indeed, the courageous little trout will face and drive away a murderous pike who menaces his home, while stickleback will engage one another in such sanguinary fights for the possession of their mates that only the Kilkenny cats can be named in the same day with them.

The other inhabitants of the tiny brook are far more numerous than you would imagine. Miller's thumbs poke their big black heads out of holes in the clay bank at every quiet corner. Crayfish hide

among the weeds or dart between the sedges. Stone-loach flit down stream like rapid shadows when you lift the bigger pebbles under which they lie skulking. As for caddis-worms and water-spiders and the larvæ of dragon-flies, they are there by the hundred; while the full-blown insects, living flashes of light, as Tennyson calls them, poise their metallic blue bodies for a second over the ragged-robins that grow in the boggy hollows, and then dart away like lightning to the willow-herb in the distance. It is a world apart, this wee world of the streamlet; it has its own joys, its own fears, its own tragedies. The big solemn cows, with their placid great eyes, come down to drink at it unheeding, and blunder over the bank, and slide their cloven hoofs to the bottom through the clay, unaware that they have crushed a dozen maimed lives and spread terror like an earthquake over fifty small fishes. But the trout and the loaches stand with tremulous fins beating the water meanwhile ten yards below, and aghast at the cataclysm that has altered for ever their native reach. Not for fully twenty minutes do they recover heart enough to sneak up stream once more to their ruined bank and survey with strange eyes the havoc in their homesteads.

