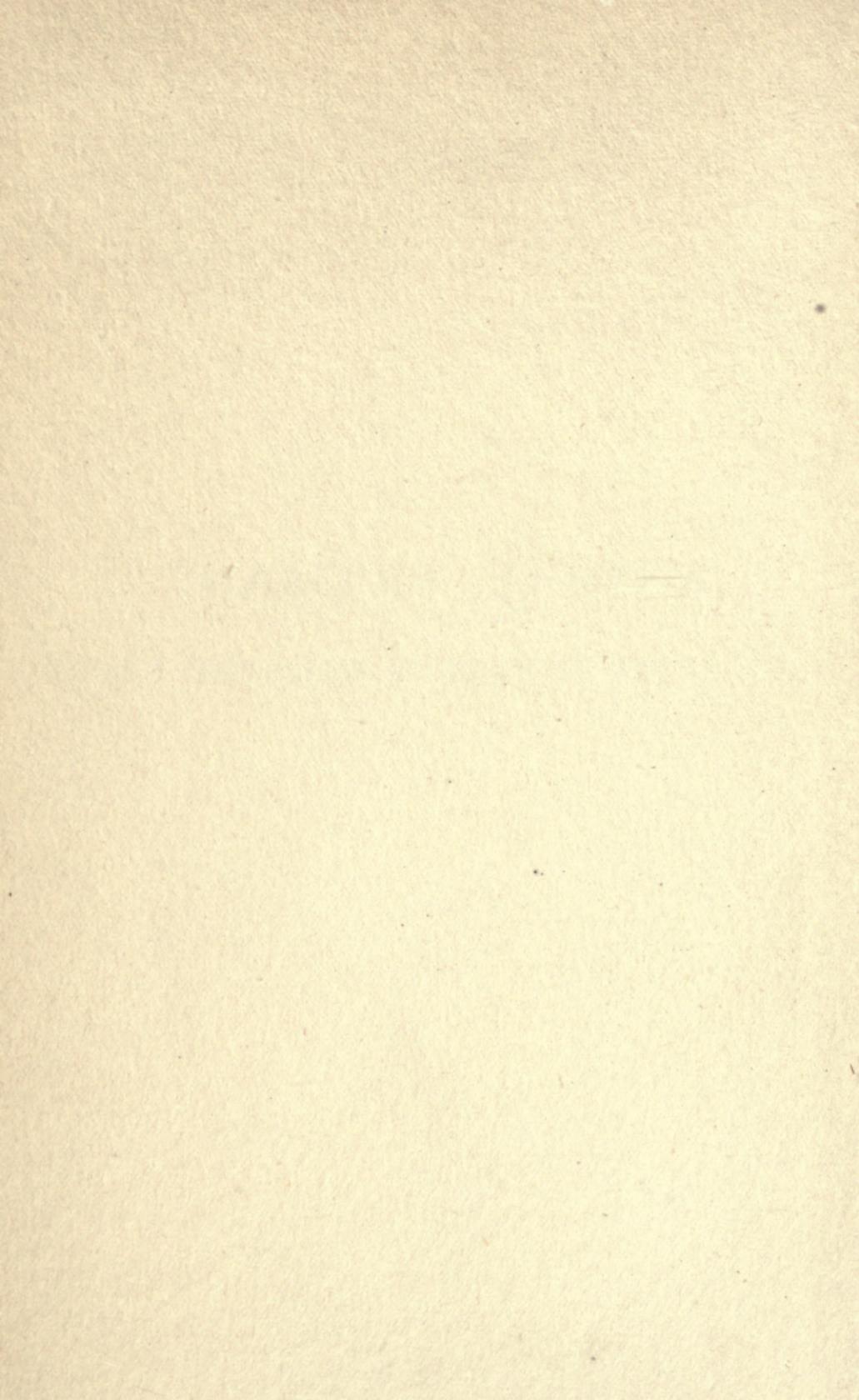


ANIMAL ARTISANS

AND OTHER STUDIES OF BIRDS AND BEASTS





CHARLES JOHN CORNISH.

(From a Portrait taken while at Oxford.)

Frontispiece

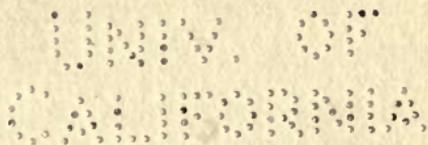
ANIMAL ARTISANS
AND OTHER STUDIES OF BIRDS
AND BEASTS

BY

C. J. CORNISH, M.A., F.Z.S.

With a Prefatory Memoir by his Widow

TWO PORTRAITS FROM PHOTOGRAPHS, AND
TWELVE DRAWINGS BY PATTEN WILSON



LONGMANS, GREEN, AND CO.
39 PATERNOSTER ROW, LONDON
NEW YORK, BOMBAY, AND CALCUTTA

1907

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AUGUST 1900

P R E F A C E

THE greater number of the papers included in this book have already appeared, like most of the Author's work, in the pages of the *Spectator* and of *Country Life*, and my sincerest thanks are due to the proprietors and editors of those papers for the help and encouragement which they have given me, and for permission to reprint the essays in their present form.

Some of the chapters my husband had himself re-written and extended with a view to republication; the rest I have chosen from his numerous papers on similar subjects which are available, as having most in common with those he had already selected.

I fear that the title "Animal Artisans" is not applicable, in the current sense of the word artisan, to all the subjects dealt with; but if the word is interpreted in its original and wider sense, as meaning one "skilled in any art, mystery, or trade," it does, I think, apply to the greater number of animals whose habits or activities are here described.

In some chapters purely topical allusions, which have become out of date, have been altered or removed;

in others, additional matter has been added from my husband's own notes and elsewhere; more especially when fresh evidence in support of any point he put forward has presented itself since an article was written. In other respects I have made as few alterations as possible, and I trust that this course will commend itself to those who have encouraged me to put together these papers and others from my husband's pen which I hope to publish in book form ere long.

The many letters full of sympathy and regret, which reached me from known and unknown friends all over the world at the time of his death, suggested that some account of his life and work might be welcome to those of his readers who never knew him personally, and to others who admired his often unsigned writings without being aware of the identity of their author. And it seemed appropriate that such an account should be embodied in the preface to this book.

But it would be impossible for one bound to him as I am to write dispassionately of one so dear and so lately lost, or to attempt anything like an appreciation of his work which could claim to be in any degree authoritative or final. I have therefore only attempted myself to record the bare facts of his life, leaving the task of appraising the value of his work to others.

PREFACE

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May I in conclusion be allowed to add that the letters already referred to, and the generous tributes to my husband's work and memory which appeared in so many of the daily and weekly papers at the time of his death, gave the greatest possible consolation to all who loved him. In the following pages I have borrowed freely from both these sources, and here tender my heartfelt thanks to those writers to whom I am thereby so deeply indebted.

EDITH CORNISH.

EYOT VILLA,
CHISWICK MALL, *October* 1906.

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MEMOIR

CHARLES JOHN CORNISH

Born September 28, 1858. Died January 30, 1906

“It is not growing like a tree
In bulk doth make man better be :
Or standing long an oak, three hundred year,
To fall a log at last, dry, bald, and sere :
: : : : : :
In just proportions we just beauties see ;
And in short measures life may perfect be.”

—BEN JONSON.

CHARLES JOHN CORNISH was born on September 28, 1858, at Salcombe House, Salcombe Regis, Devon, the home of his grandfather, then Deputy-Lieutenant of the county. He was sprung from a family long connected with Devonshire and Cornwall, and his literary tastes and love of natural history were hereditary.

Several of his forebears attained distinction as scholars, or held exhibitions and scholarships at Oxford on the Rous and Wadham foundations by their “right of founder’s kin”; while his great-grandfather, Mr. James Cornish of Totnes and Blackhall, wrote a book on the culture and preservation of salmon and other fish in the Devonshire rivers,

in which many of Frank Buckland's suggestions were forestalled by half a century.

Charles Cornish was the eldest son of the Rev. C. J. Cornish (now of Thurlestone, Fleet), sometime scholar of Eton and of Corpus Christi College, Oxford, afterwards Vicar of Debenham in Suffolk, and then Rector of Childrey, Berks, to which living he was presented by his college in 1882. To his father's influence Charles Cornish ascribed his love of sport and of the classics, a debt which he acknowledged in the dedication of the "Nights with an Old Gunner." In his personal appearance, vivacity, and eager activity of mind and body, he strongly resembled his mother. From her, too, he inherited his taste for languages and powers of expression, while the whole of his childhood and early manhood were deeply influenced by her personal charm, fine character, and great intellectual gifts, which have become an abiding tradition in the Suffolk village which was the home of her sons' earlier years.

The boundless energy, quick fancy, and intense interest and curiosity in everything around him, which are apparent in his writings, characterised him from his earliest years. When a tiny child in petticoats, he not only knew the habits and nesting-places of nearly all the living inhabitants of the garden and fields in which he and his brothers played, but his vivid imagination, eager for adventure, peopled their little world with a more remarkable fauna of his own creation.

Occasionally this led to misunderstanding or worse ;

as when he complimented a relative on the number of *lions* in his garden, and was reprimanded for "telling lies," or on another occasion when the brothers went to spear "Merrymaids"¹ in a moat, and in the ardour of pursuit the younger boy over-balanced himself and was very nearly drowned.

When very little older he was introduced to more prosaic forms of sport, and he always loved to remember his earliest "first of September." That took place at his grandfather's home in Devonshire, when he was still such a little boy, that he and his brother James both rode up the steep red hillsides together on one pony, and later on in the day when walking with the guns they were each given a hare to carry, to stop them from talking so much; and a very effectual remedy they found it!

As he grew older his ready resourcefulness and powers of organisation quickly made him a leader in the enterprises of his boyish companions. Many are the tales which they can tell of the games of football which he organised, his rambles over the country in his ardour for birds' eggs, his search for fossils in the watercourses, and his general knowledge of animal and plant life. It must be admitted that his ingenuity in devising new forms of activity hitherto undreamt of, was a source of some disquietude to the mothers of more conventionally-minded but equally energetic sons. For certain brilliant ideas of his were carried out with a characteristic thoroughness and disregard of anything but the matter in hand, which was

¹ Suffolk word meaning Mermaids.

rather disastrous in its after effects. Such was the "Siege of Jotapata," as re-enacted strictly according to Josephus, in and around an empty stable at the back of the Vicarage. The methods of constructing and working siege implements had been carefully studied by the three brothers, and their battering-ram (weighted with lead stripped from the stable roof) proved so effective that a breach a couple of feet square was very soon made in a particularly solid wall. In the meantime, the beleaguered citizens running short of "clods," the orthodox missile of Suffolk boyhood, and disdaining stones as unsportsmanlike, supplied themselves with ammunition from the winter's supply of potatoes which were stored in the loft above the stable. After that sieges were voted too expensive a form of amusement, but further scenes from Jewish history were enacted in the "Caves of Engedi," which were mined in the gravel banks of the river Deben.

At fourteen, up till which age he had been educated at home by his father and mother, Charles Cornish went to Charterhouse, just after the school had been moved from London to its new home at Godalming. The fauna of the Surrey hills is, needless to say, totally different from that of high Suffolk, but, to use words applied to him in later life, "almost by instinct he would come to a right conclusion as to the birds that would be found in a district to which he had previously been a stranger, and it was seldom that he looked for them without success. He was an expert in finding nests, and it was scarcely possible to show him one concerning which he had not some

interesting fact or feature to describe." So it came about that at Charterhouse natural history specimens which he collected became the nucleus of what is now the school museum, and he very soon earned a reputation for natural history lore which was sometimes rather hard to live up to. In his second term he was sent for by a sixth-form boy, and on entering his study was greeted as follows: "Hullo! you're a naturalist, aren't you? Very well then, you may as well be useful. Just get along out at once and stop the row these beastly nightingales are making, then perhaps I shall be able to get on with my work."

The thickets on the slope below the school buildings held at that time plenty of rabbits as well as nightingales, and these coverts afforded opportunities, too good to be neglected, for more or less surreptitious ferreting; the chief drawback to which was that the ferrets would never learn to recognise the school bell as a signal to come to the surface, and so were rather apt to get lost. Pistol shooting was another unrecognised joy sometimes indulged in with quite as much zest as the legitimate practice of the school rifle corps, of which he was one of the earliest members. He won a place in the first team which Charterhouse sent to Wimbledon to compete for the Ashburton Shield; a team which also included the future General Baden-Powell.

As soon as school hours are over at Charterhouse, the real business of the spring and autumn terms is Association football, and at this Charles Cornish very soon became an expert. Though small and some-

what slightly built, his fleetness of foot, and the general alertness of eye and movement which later on made him such a first-rate game shot, also made him one of the best public school "forwards" of his year; and though he afterwards lost his speed, he kept his love of the game, and continued to play occasionally at Charterhouse and elsewhere till an age when most men have long discarded so arduous a game.

As to his more serious studies at Charterhouse, he always maintained that he was lazy there, and did not learn as much as he ought to have done, but his ideas of laziness were so different from those of most other people that this statement cannot be accepted without a good deal of reserve. At the end of his second term he won the classical prize given for the whole of the lower school, and always took a very good place in the school, besides winning the lasting affection of many of his masters and schoolfellows. One of the latter who did not meet him for some years, wrote to me recently: "He was one of my old school and college friends of whom I always think with great affection. I have the happiest recollection of him, and there never was a time when I did not admire the spirit and enthusiasm which marked all that he did, and which ensured success in whatever he undertook." Charles Cornish's own recollections of Charterhouse were among the happiest of his life; and it was one of his greatest pleasures to revisit the school from time to time, and to stay with his former house-master, the Rev.

H. J. Evans, for whom and for all his family he had the warmest regard.

It had been his wish either to go into the army or to continue his education at Oxford; but when he left Charterhouse circumstances made either course almost impossible for the time being. Though it was necessary for him to find some employment at once on leaving school, he did not give up the idea of going to Oxford later on, but set to work with characteristic energy and courage to earn the means to take him there. A private tutorship seemed to him to offer the best opening for this purpose, and he shortly afterwards obtained such a post in Yorkshire. He was then not eighteen, and his pupil, an only son, was some eight or nine years younger than himself, but before long they became so much attached to one another that their relations were more like those of an elder and younger brother than of a tutor and pupil, and the strong affection which sprung up between them lasted all his life. His relations, too, with his pupil's parents were of the happiest description, and he always felt how much he himself owed to the scholarly tastes and kindly guidance that he met with in that household. He made many friends in Yorkshire, and constantly revisited them in later years. "I have never forgotten," writes one of the friends of his youth, "the delightful days we had together at L——, getting up at three and four to go after wild duck. I thoroughly enjoyed those walks and talks with him, and he taught me to use my eyes."

His delight in the strange beauty of the Doncaster

carrs, over which he often shot while on these Yorkshire visits, and his appreciation of the canny sense and dry humour of the Yorkshire people, are shown in "Wild England" and the "Nights with an Old Gunner." These, too, give some hint of his knowledge of the West Riding dialect, one of the many local "tongues" for which he possessed an extraordinary aptitude. He could faultlessly render or interpret the local intonations of Norfolk, Suffolk, Berkshire, Yorkshire, Devonshire, and Cumberland; and his unusual abilities in this direction may partly have accounted for his power of quickly gaining the confidence and liking of all sorts and conditions of men; whereby he acquired many odds and ends of local knowledge which would never have reached a man of less flexible and sympathetic temperament.

He remained with his first pupil for four and a half years, when the latter went to Eton and he himself to Oxford. There he took a scholarship at Hertford College, and subsequently his tutor recommended him for an exhibition that was in the gift of the Principal. With this help, together with his savings and the remuneration for extra teaching undertaken during the vacations and in his "grace terms," he was able to complete his University course entirely at his own expense. He had, of course, gone up a few years later than most of his contemporaries, and the work which he undertook during the vacations left him little time for extra reading, but he nevertheless took a good second in Greats. He also had charge of the college library, and won his Blue at

Association football, playing in the 'Varsity match of 1883. The portrait which forms the frontispiece to this book (an extremely good likeness) was enlarged from one in a group photographed immediately before the match for the Inter-collegiate cup won by Hertford in 1885.

His life at Oxford was a very happy one. He had successfully accomplished the first task which he had set himself to carry out, and this in itself was a source of considerable satisfaction to him. Although most of his old school friends had left Oxford before he went up, he found many other congenial companions. Readers of his articles in *Country Life* on old houses, mills, bridges, and old architecture generally, will readily understand how keenly he enjoyed the architectural beauty and historic associations of the University and its buildings, while the treasures of the Bodleian and the peaceful loveliness of the river scenery appealed with equal force to his keenly appreciative nature.

In the meantime his father had left Suffolk and become Rector of Childrey, a village on the slope of the Berkshire downs, and Charles Cornish soon came to know and love the rolling down country and the wide vale beneath as well as the poplar-studded meadows of his Suffolk home. The Berkshire downs were at that time still a great corn-growing country, where the down partridges flourished; and the shooting of the Childrey glebe, some six hundred acres in extent, was always reserved by the Rector for his sons and their friends. The fields were wide and

unfenced, and birds flew far and fast, but no first of September was considered a good one unless the three brothers shot at least twenty brace; and as this was always over dogs, it meant any amount of walking, and straight shooting besides. But in the words of a friend who shared another shooting with him on these same downs in recent years, he "cared little for a large bag, but any little device by which we could steal a march on the game or counteract its wiles, brought out all his powers of observation and resource, and his keenness inspired keeper and beaters and even the dogs to their best efforts; and when we stayed over the week-end . . . the Sunday walk over the downs and among the villages so rich in historic interest and picturesque beauty, was made memorable by his wide knowledge of the country and his overflowing curiosity about everything and everybody that fell in our way." From his boyhood upwards he was always a good, and often a brilliant shot, but "from the time he used a catapult till he ascended through a single-barrelled muzzle-loader to a breech-loader, he was always a naturalist as well as a sportsman." His extraordinary memory enabled him to recall every incident of a day's shooting, and not only details as to the bag, but particulars of every unusual or interesting episode which occurred were carefully set down by himself or his brothers in a series of note-books on sport and natural history which extended over twenty years. When he began to write regularly these notes were invaluable to him, but "it was comparatively late in his career before he thought of putting his ideas

into print. The knowledge of field and wood lore that won him distinction had indeed been garnered during his earliest years, . . . but he had studied wild life and natural history, not because he wanted to make copy out of it, but for the reason that he had been born with a temperament which was spontaneously interested in all that appertained to the open air and to outdoor sport."

His first essay on a natural history subject was not written until after he had left Oxford and settled in London as an assistant Classical Master at St. Paul's School; a position which he held until the time of his death twenty years later.

His gift of sympathy for the young, his general alertness, and his powers of organisation and expression "made him a most successful and efficient schoolmaster . . . and he inspired his pupils with something of his own energy and love of work." And when the hand of Death was heavy upon him, and much that he had hoped to do still undone, it comforted him to think that he had succeeded in this. When he felt that his own day was over, his thoughts turned to the boys he had taught—those still at school, and others boys no longer and out in the world—for some of them had been very dear to him. It seemed to him then that he had failed in many things; "but," he said, "I *have* taught them to work, or at least to be ashamed of being lazy."

Fond as he was of boys, both in an out of school hours, he was a very strict disciplinarian, as any who were inclined to be troublesome soon found to their

cost; and though he seldom punished a boy, few masters at St. Paul's were more feared than he by any really indolent or mutinous spirits which came in contact with him.

In every case he tried to develop his pupil's special interests, and so to bring out the best side of every boy. It was part of his special work to set the papers for the junior scholarship examination, and he invariably arranged that in the "general knowledge" papers there should be something to suit all tastes, and that every boy should have a chance to show his knowledge of some special subject. He did all he could, too, to teach his form to think and to express themselves intelligently, for he held that in every walk of life it is an immense advantage to a man to be able to make a clear and concise report; while those who showed any literary ability he delighted to encourage with sympathy and advice. He was for many years one of the editing committee of the school magazine, the *Pauline*, and, as was noted in the obituary notice of him in that paper, "every number testified to his energy and vigilance. . . . But," the same paper continues, "undoubtedly the most striking monument to Mr. Cornish's energy at St. Paul's is the Field Club. Initiated by him in 1896, and drawing its vitality mainly from the abundant springs of his enthusiasm, the club has known a continually increasing prosperity, and now holds a place among the most flourishing of the school societies." Its headquarters in his class-room at St. Paul's, with its cases of stuffed birds and beasts, of shells and plants, re-



CHARLES JOHN CORNISH AND HIS DAUGHTER.

(From a Photograph by Miss Blanche Thornycroft).

sembled a small museum. Many of the specimens have been presented (through the president's agency) by the authorities of the Natural History Museum at South Kensington; others have been collected and set up by members of the club, and in many cases their work could scarcely be improved upon either in scientific arrangement or artistic execution. From the beginning the club numbered among its members several Paulines of exceptional ability, and though as collectors they were naturally at a disadvantage from the fact that they lived in London, when the first Nature Study exhibition was held at the Botanical Gardens in 1902, the St. Paul's School Field Club exhibits were among those selected for the highest honours.

The weekly meetings of the Field Club were a real pleasure to its president, and he was always ready himself to learn from those of its members who were specialists in any particular subject. I remember the delight with which he afterwards recounted how, when an error in some other natural history writer's facts had been commented on, a small boy remarked demurely, with a twinkle in his eye, "But of course, sir, he hadn't the advantage of a form of well-informed boys to consult."

It was one of his distractions during his long illness to make plans for the future well-being of the Field Club, and one of the last letters he dictated was to inquire about some fishing near London which he hoped to be able to take for the use of its members. This very genuine interest in their amusements as well as in their work naturally made him a favourite

with his form, and "among his colleagues," says the *Pauline*, "he was justly popular. He was remarkable for the loyalty of his friendship, and when he undertook to do anything he never failed to carry it through to the best of his ability. Perhaps his chief characteristic was an energy and alertness which gave an impression of one who was armed at all points, ready to say and do what the moment might require. Though his life has ended prematurely, he leaves behind him a record of sincere and honourable work which is an example to all, and which many a veteran might envy."

How deeply his loss was felt by many of his colleagues the following extracts show. One with whom he had been closely associated during the whole of his work at St. Paul's, writes: "I knew him better than most of his colleagues, and I am quite unable to express to you my own feelings. I always told him he worked too hard;" and another: "I shall never forget the many acts of kindness and consideration I received from him;" and yet another: "Of all my colleagues at —— and —— there has not been one whom I loved so unreservedly or who showed me the same affection . . . I loved him as I have loved few men."

But good as his record as a schoolmaster was, it was by his work outside St. Paul's that he was known to the world at large. Soon after he came to London he began to write occasional articles for the *St. James's Gazette*, then edited by Mr. Greenwood, the *Globe*, *Field*, *Yorkshire Post*, and other papers, and in 1890 he became a regular contributor to the *Spectator*.

Although his articles in that paper were unsigned, many of its readers soon learned to recognise his delightful discourses on animals and outdoor life, but few were aware that some of the articles on naval and military matters (particularly on the importance of rifle-shooting), and others on such varied topics as "Steeplejacks," "Modern Burglary," "Li Hung Chang's Furs," "Children at the Guildhall," "Race as a Factor in County Elections," and "The Moral Value of Ancestors" were also from his pen.

After the birth of his little daughter in 1894, his studies of childhood appeared more frequently, and though comparatively few in number they are, in the opinion of the editor of the *Spectator*, among the very best he ever wrote.¹ His first book, a monograph on the New Forest, was published in 1894. This was quickly followed by "Life at the Zoo," which at once "produced an impression that here was a new writer on open-air subjects who was looking at his world independently with his own eyes, and reproducing impressions which were peculiar to himself." With the publication of "Wild England," the "Old Gunner," and the other books which followed, recognition of this grew deeper; and he was soon offered far more literary work than his various duties would allow him to undertake.

When *Country Life* embarked on its prosperous career, Charles Cornish at once became a regular contributor, and later on its shooting editor. In spite of the funds of past experience which his well-stored

¹ I hope at some future date to republish these in book form.—ED.

memory enabled him to draw upon, it would have been impossible for him to keep up to date with the outdoor subjects on which he wrote without the opportunities of absence from London, which his school vacations afforded him, and his readers already know to a great extent how these vacations were spent. In the New Forest, he studied the glades around Rufus' Stone, and strove to unravel the mystery of the Red King's death, or drifted with the flood-tide up the Beaulieu river, watching the swans nesting among the pink-flowered thrift on its banks, and the many-hued medusæ floating up with the salt tide from the sea. In the Norfolk marshes with the old gunner Barrett, he lay in wait for the fighting geese; or underneath the tall cliffs of "the Wight," he watched the culver peregrines winging out to the horizon, or the black lines of cormorants coming home to roost. In Berkshire he noted the rise and fall of the dewponds on the downs, and counted the dragonflies by the old canal, or watched the great chub cruising below the bridge at Clifton Hampden, and the woodpeckers raiding ants' nests in the old camp on Sinodun Hill.

Together with a brother or a friend he usually took a modest shooting in Berkshire or Suffolk, and latterly he spent some time each year in fishing in the north of England, under the shadow of the Pennine Range. This was a new pleasure to him, and largely in a new country; but in the words of the friend to whom he was indebted for this fresh interest, "His extraordinary keenness and youthfulness endeared him

to every one up in Cumberland. . . . Coming up into a new country, he seemed to get to know the farmers and keepers and people about in a wonderful way. They always asked after him whenever I was there, and looked upon him with the greatest respect and kindness."

Although for nearly three months of his year he was free from school work, he could scarcely ever be persuaded to take a real holiday. He usually wrote for several hours daily throughout the year, although the ardour with which he carried out all he undertook made an occasional complete rest an even more urgent necessity to him than to less active natures.

In his later years he not only wrote his weekly article for the *Spectator*, and edited the shooting department of *Country Life*, but often wrote one or more articles for the latter paper, in addition to a leader and other matter for the *County Gentleman*, and a good deal of miscellaneous writing and editing besides.

The nature of the subjects on which he wrote often entailed a great deal of preliminary correspondence, and besides writing the articles he usually had to think of half-a-dozen suitable subjects every week; but no matter how pressed he might be, he would never fail to do what he had promised, and if any of the staff of either paper were ill, he was always ready to step into the breach and do extra work if required. In the words of one of his fellow-writers, "He was the most loyal of colleagues, who never made any difficulties, and always gave us of his best.

. . . His loss to the paper is irreparable. . . . He was by far the best writer on Wild Life in any British paper, and for many years gave pleasure and delight of the purest kind to thousands of readers who never saw him, but were none the less his debtors, and will never forget his lessons."

But all this ceaseless activity, often involving long journeys on the top of his regular school work, undoubtedly overtaxed his strength, especially after an unfortunate shooting accident had sowed the seeds of a disease which in the end proved fatal. Though very dangerously ill for some days after this accident—a fall, in which he sustained severe internal injuries—he recovered quickly and, it was hoped at the time, completely. But a few years later symptoms of kidney disease came on, and for nearly a year he suffered from constant attacks of such intense pain that it was feared an operation would be unavoidable. With care and less drastic treatment, however, these attacks gradually subsided, and though he was warned that overwork, worry, or a too sedentary life would be exceedingly likely to bring on a recurrence, for a time all seemed to go well. Then as years went on and his literary reputation and work increased, the time he allowed himself for exercise and recreation grew less and less. The game of rackets or tennis which he had been in the habit of playing during his midday breaks was given up, so were the walks that he formerly took when his afternoon's work was over; and he frequently worked so late in the evening that he was unable to sleep

when he wished to do so. Slowly but surely this began to tell on his health, and though the outside world knew little of this, those nearest to him saw only too plainly that all was not well with him. Always of a highly-strung nervous temperament, he became over-anxious about his work, both at St. Paul's and elsewhere. Those who only knew him as a journalist and author could scarcely credit that he was still working at St. Paul's besides, and the knowledge that he was doing more than to some people seemed possible, kept him in a constant state of anxiety lest one or another of his employers might think that he was giving undue attention to the business of the others.

Although the thoroughness of his work at St. Paul's was constantly proved by the success of his pupils in public examinations (nearly 90 per cent. actually passed the London Matriculation examination in the subjects in which he prepared them), and though constantly assured by equally satisfactory tests of the excellence of his literary work, his mind was never at rest, and this in itself greatly increased the strain upon him. Above all things it distressed him if it were suggested that he was over-worked: not for any fear of the injury it might do to himself, but lest it should be considered possible that his work itself might suffer. His own writings, as well as the testimony of all who knew him, are abundant evidence of his unusually keen powers of appreciation of all that was good in life; but he was equally sensitive to adverse influences,

and his capacity for suffering was always as intense as his powers of enjoyment. This very rarely appeared in his writings, for he always preferred to write of the happier side of things, and for the time being could completely identify himself with his subject. But as his health declined, his powers of enjoyment waned, while even the lesser worries of life fretted him, until they became at times an almost intolerable burden.

The Christmas of 1904 was spent at Sidmouth, which he had not visited for several years. He thoroughly enjoyed meeting old friends again, talked of buying some of the land which his cousin Bishop Kestell-Cornish was offering for sale, and returned to London rather better in health. But immediately afterwards he had a slight attack of influenza, and from that he never recovered.

He never would leave his post at St. Paul's for a single day if it could possibly be avoided, and on this occasion (as on many others) he returned to work when quite unfit to go out. From that time his health became much worse, but he would not acknowledge himself to be really ill, though the fact was painfully apparent to those about him; he worked on the same as ever, steadily maintaining that if he could do his work properly there could not be much the matter with him, and that a good rest later on would set him right again. The following autumn the asthma from which he had been suffering so increased that he was obliged to seek medical aid. His condition was then found to be most alarming,

for the asthma was in reality a symptom of advanced kidney disease, and it was decided that if his life was to be prolonged he must stop all work and spend the winter in Egypt or Algeria ; but it was too late.

On the 28th October there appeared in the *Spectator* "a discourse on the shape and colour of leaves, and no paper richer in suggestion or poetic charm ever came from his pen," but it was his last. A few days later his strength suddenly collapsed, and though he recovered to a certain extent after this, it was the beginning of the end. For a time his great vitality still gave hopes of a partial recovery, but the nervous energy which kept him alive also prevented him from resting as completely as he should have done. As soon as he was a little stronger, he insisted on writing a little ; when this exertion was too much for him he would dictate to a shorthand writer ; and though he never wrote another article for the *Spectator*, several short papers were written for *Country Life* in this way.

Early in December he was sufficiently well to be moved to Worthing, and at first he seemed better for the change, as his cough and difficulty in breathing almost disappeared. But an attack of acute pericarditis on January 22nd made recovery out of the question, and he grew gradually weaker, until in the early morning of January 30th he fell asleep so peacefully that those around him scarcely knew when he had passed away.

.....
"It is possible that if he could have been persuaded in time to limit his work to one or other of the

directions in which his many-sided interests led him, his life might have been spared for many years longer. But, on the one hand, his enjoyment of life and all that it offered to his active mind and wide sympathies was so keen that it seemed impossible for him to draw in; on the other, his natural modesty led him to fear that if he were not at once ready to take up every piece of work as it came he might drop behind and be overlooked in the struggle for existence. It was hard to convince him that such fears were groundless, and that there would always be a demand for work so sincere and so stimulating as his." It had always been rather a weakness of his to pride himself on never doing anything slowly. Alas! he could not even *live* slowly, and so his life was over all too soon.

And yet even those who love him best cannot but feel that for himself it is happier so, for had he survived what proved to be his last illness, his must have been but a feeble and flickering life. Bravely as he had lived and worked in spite of ever-increasing weakness until the end, an invalid's existence would have been almost intolerable to him, and those who love and mourn him most cannot be otherwise than thankful that his eager spirit is spared the burden of inactive years.

EDITH CORNISH.

ANIMAL ARTISANS

CHAPTER I

MINOR MASONS

IF ever the Fraternity of the Ancient Order of Freemasons chooses to add a crest to the many bearings which it emblazons among its insignia, the claims of a very remarkable little bird to that honour are worthy of consideration. It is the black wheatear, which crosses the Straits of Gibraltar in the spring to nest among the rocks and stones of the south Spanish provinces. In form it is like the well-known English wheatear, but not in colour; for though it has the same alert appearance, and the broad white band across the lower part of the back which makes the latter so conspicuous, the rest of the plumage, instead of being light grey and buff, looks as if it had been dipped in the inkpot.

The Spaniards near Malaga call this bird the *pedrero*, or "stonemason," from its peculiar taste in nest-building. The common wheatear usually builds in a rabbit-hole. Several of them have nested lately in the open warren in Richmond Park. The black wheatear sometimes builds in a deep crevice in a cliff; but more often it chooses a low excavation, or horizontal

cleft, or low cave, and there sets to work with tremendous energy to make a stone foundation for its house and a stone wall around or in front of it. Technically speaking, the *pedrero* is not so much a mason as what is called in Yorkshire a "dry dyker"—that is, he uses no mortar in his job, though some other birds can mix mortar to dry to any degree of hardness. In the Boer war the dry dykers of a certain East Yorkshire regiment used to be asked to volunteer to build "sangars," those being practically the same as the dry stone walls of the North. If Aristophanes had been acquainted with the black wheatear's accomplishment, he would no doubt have assigned to it the business of building the walls round the City of the Birds when about to establish their league between the realms of the gods and the habitations of men.

Having chosen the place for its home—which, due regard being had to proportionate size, in comparison to human ideas, would represent to the bird a low-browed cavern much like that in which the remains of the great sloth were found in Patagonia—it first collects a number of stones, and places them together as a foundation for the future nest. Next, and this is much more strange, it builds a sangar, or dry stone wall, all along the front of the space which the nest is to occupy later. This is not a mere flimsy wall, but often a solid barrier, in which the stones are piled in such a way as to make it almost or quite as thick as it is long. The barrier of stones in front of one nest found by Colonel Howard Irby, and described

in his book on the "Ornithology of the Straits of Gibraltar," was 9 in. long, 9 in. thick, and $2\frac{1}{2}$ in. high. In this barrier there were no less than 282 stones. In the foundation of the nest were 76 more, making 358 in all, of which the total weight was $4\frac{1}{2}$ lb., the largest stone weighing 2 oz. It is difficult to imagine how the little wheatear, intermediate in size between a thrush and a robin, managed to carry a stone of this weight. But perhaps it found this particular pebble *in situ*. Having thus made the foundation and wall of stone, it builds inside the latter a comfortable nest, the upholstering of which is in no way deficient in finish. The reason for this hereditary taste for "overbuilding its position" may perhaps be explained by a wish to improve the site rather than the nest. Some other birds try to make up for deficiencies in the position of the nest somewhat in the same way. The nuthatch, if the hole leading to the place where it means to nest in a wall or hollow tree is too large, will plaster the opening up with a special cement, which becomes too hard to be cut with a knife. In one case seen by the writer the cement patch was as large as the hand, though the hole left was no larger than a crown piece. The nuthatch's ideal is a hollow dead branch, into which it can bore just such a round hole. In this case it made an artificial covering to part of the cavity, and so reconstructed what was wanting.

Sometimes a house-martin, another mason bird, instead of making a simple hole at the top of the nest for an entrance, builds a kind of covered way

to it along the side of the wall. This suggests that in former ages the ideal place for a martin's nest was not under the eaves, but at the end of a hole, and that the tunnel attached to the wall is a kind of reminiscence of this. In the same way, probably the black wheatear's ideal location is a very narrow crack in a rock-face. Failing this, the barrier is built up in front in order to improve the environment, for it has no necessary result in improving the nest itself. The pebble foundations belong to a different order of ideas. Foundations of masonry of one kind or another are quite common, even among English birds. The ringed plover, which practically makes *no* nest, always lays a foundation of broken shells or little stones, on which the four eggs are placed. It commonly scatters a few broken shells round it too, even if the nest is made upon the grass or on sand. The black-bird and the magpie, as well as the carrion-crow, sometimes build foundations of mud, which hardens into a kind of mortar, for their nests, the blackbird also working this mud into a cup, which is subsequently lined. The material is usually taken from the nearest ditch. The thrush, on the other hand, makes a very careful "compost" of cow-dung and rotten wood, smooths this into a perfect bowl, and lays its eggs directly on this extremely clean, hard, and light lining. The only drawback to this and to the mud nests is that the rain soon softens them, though the thrush's compost lasts the longer. Both birds seem to understand the art of *mixing* their building material into a uniform substance. The swallows and house-

martins, on the other hand, build by sticking together pellets of prepared road-mud. Most of the material is obtained from the drying puddles on the high-roads. Clearly, if not mixed with anything else, the tendency of these pellets would be to crumble when dry. But the swallow tribe are supplied with a mucous secretion which enables them to gum the particles together. The swallows' nests from which the Chinese bird's-nest soup is made are constructed of this mucous matter only; while an Indian swift, which builds little boat-shaped nests against the trunks of lofty trees, practically makes them of dried saliva.

The best mason among the birds of the New World is a potter as well. It is the oven-bird of the pampas. It is called the *casara*, or house-builder, by the Spaniards. The nest is made of mud and bits of straw, practically the same as the material used for most buildings in Mexico. The walls are very thick, and there is a partition wall inside, reaching so high as to form an antechamber. Except the beaver (which is such an accomplished designer that he must be considered an engineer rather than a mere mason) and certain rats which build walls of stones and of thorns to keep out snakes, there are few masons among mammals. But the methods of the swallows and martins are closely imitated by the greater number of minor masons, from perfect insects such as the mason wasps and bees down to the sea-worms that build themselves tubes of sand. The general principle is to make pellets, and then to harden and join them by some secretion, though sometimes this home-made mortar is only

used to stick existing material together. Some of the most charming little workers to watch are the mason bees and mason wasps. Much has been written about them. But they are by no means very common insects, and not conspicuous. Consequently, their work is not so often seen as might be expected. They are solitary little creatures, and have none of the fussy aggressiveness of the social bees and wasps, often seeming rather to enjoy the company of an onlooker, and sometimes being quite willing to be fed. Some of the mason wasps combine the parts of mason and miner. One makes burrows in hard sandbanks, but like the old Suffolk squires who dug a moat *round* their future house, and formed the bricks to build it with out of the earth they removed, this wasp moulds the sand which it digs out into bricks, stuck together with gum, and piles these in a kind of tower round the shaft, like the towers which cap old mine-shafts in the North and Midlands. Then, when the shaft is finished, it takes down the tower, and uses the bricks to line the bottom of the hole with, so that no enemy may break into the safe in which its eggs are laid. Another mason wasp chooses bricks to burrow in, removing the particles in the form of brick-dust, which it excavates with its steel-like jaws. Not satisfied with a brick chamber, it flies away, fetches puddled clay, lines the chamber, lays the eggs, and then stops up the entrance with the same mortar. This, be it noticed, is not "pellet" masonry. A mason bee builds its nest of mud and minute pebbles. Sometimes what looks like a large mud-splash thrown by a child at a wall, or

squirted up by the wheels of a passing cart, may be seen. The one suspicious fact about it is that it is the *only* mud-splash there. If opened with a knife, neat cells made of pellets and shaped like jars will be found holding the eggs or larvæ of the bee. Sometimes one or two neat little jars of masonry are found merely stuck on to a wall.

Mason birds have a great affection for an old nesting-place. It seems as if the same feeling were shared by mason insects. Some years ago a mason wasp made a cell inside the keyhole of a bureau in a bedroom; when the bedroom door was shut, it used to come in through the keyhole *in the door*. Next year this bureau keyhole was again tenanted by a mason wasp! One small British fresh-water fish builds stone breakwaters to protect its eggs from being washed away by the current, much in the same way that the *pedrero* bird makes a sangar. This is the lamprey, a very curious creature, formerly very common in the Thames, whence they migrated to the brackish waters of the estuary at certain seasons. Charles St. John watched a pair of these little fish for some time at work in a running ditch, painfully collecting stones and pushing them up into little heaps. The stones were apparently pushed; but it is more probable that they were carried in the sucker-like mouth of the lamprey.

CHAPTER II

CARPENTER BIRDS

WOODPECKERS are so bright in plumage, so alike in their habits, and so thoroughly masters of their own peculiar way of making a living, in which they do not interfere with man, bird, or beast, that wherever they are numerous they attract, and deserve, a greater share of interest than falls to many other classes of bird.

The Romans apparently looked on the woodpecker as the first inventor of spirit-rapping, and identified it with a remarkably old-fashioned god who had the gift of rustic prophecy. When they wanted to pay the god a compliment they set up a pillar with a woodpecker on the top. Later they set up his statue with the bird carved sitting on his head. The Spaniards, both in the Old and New World, called the woodpecker the *carpintero*, to which his feats in drilling holes in wood fully entitle him, even more than does the sound of his hammer tapping on the trees.

Yet M. de Buffon in one of his flights of fancy chose to identify the position of the *carpinteros* in the community of the air with that of the French peasants on the great estates. He described them as con-

demned to spend their lives crawling on the trunks of trees, toiling for the meanest fare, unable to join in the gaities of other creatures, and without even a change of diet, or a palate sensitive enough to appreciate the delicacies of life. All this commiseration was quite unnecessary. The woodpeckers have what is generally known as "a good time." Nor is it the case that they only live on the grubs which they bore out of rotten wood or extract from the crevices of the bark.

Looking at the fine contrasts of black, white, crimson, or green on their plumage, it might be guessed that our woodpeckers have some affinities with birds of less northern range. The fact is that not only are there a great number of species in Northern and Tropical America, but that they are also numerous in North Africa, India, and as far south as the Celebes, where the "Wallace line" cuts them off from the Australian region. In both Central and Southern America, and in most tropical countries except Australia, they have for first cousins those curious, ungainly birds, with oversized heads and beaks, called barbets. These are mainly fruit-eaters, though some feed on insects, which they take on the wing, as some of the insect-feeding kingfishers also do. The barbets bore a hole in a tree to lay their eggs in, and these are white like the woodpeckers'. So far are the latter, even those of England, from being confined entirely to a life of hard labour and incessant tree-climbing, that they all show a liking for fruit-eating, with which they are not always credited.

They also feed freely upon insects on the ground, especially upon ants and their eggs, for which they tear the ant-hills to pieces with their beaks, using these as spades or pickaxes quite as readily as they adapt them on the trunks of trees to the work of the auger and awl.

When seen running up the side of a tree, the great spotted woodpecker is perhaps the most striking of all our wood-haunting birds. The black-and-white of its plumage is set off by the brilliant crimson crest. Though credited with being a fairly common bird, it is less often seen than any of the larger species haunting our woods. There seems to be no reason why it should not be as common as the green woodpecker, which has very much increased since it gained the general protection now granted to it. But in the course of a life spent largely in observing birds the present writer has only seen the great spotted woodpecker on five occasions. On two of these the nest was found, and one was in Richmond Park. The most carefully excavated nest, or rather hole, was made in a rotten willow-tree, some twelve feet from the ground. Instead of carrying away the chips, the bird had left them all to lie below the tree, where their fresh appearance at once attracted attention. Precisely the same negligence marked the beginning of a nesting-hole close by. The fondness of these birds for fruit leads them to raid the orchards of small, black, and very sweet cherries, called in Devonshire "mazzards." In the same county, on the sea-coast, some distance from any

woods, a family of lesser spotted woodpeckers invaded a garden, and could scarcely be driven away from the red currants and raspberries.

While in this country the greater spotted woodpecker is rarer than he is believed to be, the pretty little lesser spotted species is extremely common. It is so small, and frequents such high trees, that it is not easily seen. But in spring its note, which is made probably by striking the wood, and sounds like a stick drawn sharply along a wooden paling, may often be heard in cities. The bird is quite common in Oxford, and was a regular inhabitant of Kensington Gardens. It is still abundant in Richmond Park, and may be heard in Kew Gardens. The common green woodpecker has been among the birds which have benefited most by the protection of the law, and the sentiment of which the amnesty so proclaimed was only an expression. Formerly it was steadily killed down, partly for the sake of its skin, which when stuffed was a welcome addition to the glass cases containing a jay, a sparrow-hawk, and a bullfinch which decorate cottage parlours, and partly from the persistent tradition that it was an enemy to trees. The belief that the birds bored large holes in sound oaks and elms, and so "bled" them, was widely spread. Consequently the woodman always asked his friend the keeper to shoot the woodpecker. As a matter of fact, in England the woodpecker always chooses a partially decayed tree as a nesting-place; sound wood is too hard for it to work in. But it is reported that in America the earliest erected telegraph

poles were often damaged by woodpeckers which it was supposed mistook the humming of the wires for the voices of insects concealed in the poles. The green woodpecker, like those other tree-climbers, the nuthatch, the wryneck, and the creeper, is generally so absorbed in the business of holding on and hammering or prospecting that he is easily watched from a short distance. He does not show the gaiety and *abandon* of the nuthatch, nor is he so intensely energetic as the latter. A nuthatch smashing a nut seems as if he worked like the hammer of a self-cocking gun. But the woodpecker travels fast up the trunk, and scales off bits of bark with a sideways blow wherever he sees a likely lair for grubs. Having finished one tree, he flies off, and alights on another about half-way up the trunk. He can move downwards, but does this by dropping backwards, instead of turning round and running head downwards like a nuthatch. When at work on the ground, the woodpecker's method of feeding can be seen. On the summit of Sinodun Hill, above Dorchester, is a clump of trees much affected by woodpeckers; while the steep turf banks of the ancient Celtic ramparts of the prehistoric fortress which surround it, as well as the sides of the ditch, are full of ant-hills. As the scene lies far away from men and their work, the woodpeckers have the place all to themselves. Some years ago, on a sunny day in August, a whole brood, all fully fledged, with the old birds, were enjoying themselves in digging up the ant-hills. The writer first mistook them for a brood of partridges, both from

their size and their position on the ground. They were easily stalked, and showed very little fear. Two or three birds would attack one ant-heap, digging away with their beaks, though their short claws were useless. They then retired a few inches, and leaning back with their heads held at some distance from the ground, shot out their long tongues like fishing-lines, and "whipped" the ants up at lightning speed. The beak was in no case used to pick up a single ant, but only as a mattock; the tongue did the rest.

Every one who has done any bird-nesting knows of certain groves where there are "woodpecker trees." Sometimes these trees are inhabited by both the small and large species, as the size of the holes shows. Their favourite prospecting ground is a tree which has received an injury that exposes a long length of wood without bark upon it, generally a Scotch fir. This exposed part is sometimes hollow, and always verging towards decay, which begins at the top. The woodpeckers find a place where the wood is in about the right condition, and bore a hole into it. If the interior is not yet hollow, they make a chamber and lay their eggs. They never plaster up the orifice, as a nuthatch sometimes does, but leave a clean round hole. Next year the woodpecker wants a clean nest, so it begins a foot or so lower down. If the wood is harder than it feels inclined to work upon, it goes to another tree. But in a year or two it comes back and tries the old one. In some of the woodpecker trees in the tall firs of Holly Water Clump in Woolmer Forest there are, or were, stems pierced

like a flute, with a series of holes begun or completed ; for the bird will often dig in a few inches, and then abandon the work.

The wrynecks belong to a class of carpenter birds which have no spines in their tails, and instead of the strong and bright coloration of the woodpeckers and barbets, have feathers which imitate the colour of the bark more closely than do those of any other British bird, except perhaps the mimicry of dead sticks and leaves in the plumage of the nightjar. The resemblance is as close as that between the bark-haunting moths and their favourite resting-place, so much so that wrynecks are practically invisible except while on the ground, when, like the woodpeckers, they feed on ants, and in the same way. Their choice of a nest is often in a pollard willow, dead, or partly dead, and of which portions are in a condition like that of touchwood. Into this they burrow, though their bills are far weaker than those of the woodpecker proper, and can only deal with soft material.

In California there is a woodpecker nearly two feet long ; but the most remarkable species of the United States is the ivory-billed woodpecker, found in considerable numbers in the forests of the Lower Mississippi. Piles of bark, some of the pieces eight inches square, may be found under the decayed trees on which it is, or has been, busy at work. "We used to see enormous pine-trees," says Wilson, "with cartloads of bark lying around their roots, and chips of the trunk itself in such quantities as to suggest

the idea that half-a-dozen axe-men had been at work the whole morning." The great black woodpecker of the Scandinavian and North European forests, which has occasionally strayed to England, bores holes in sound wood for its nest, as well as in decayed trees, but is said to choose the softer kinds for the work.

CHAPTER III

THE FAUNA OF THE RAILROAD

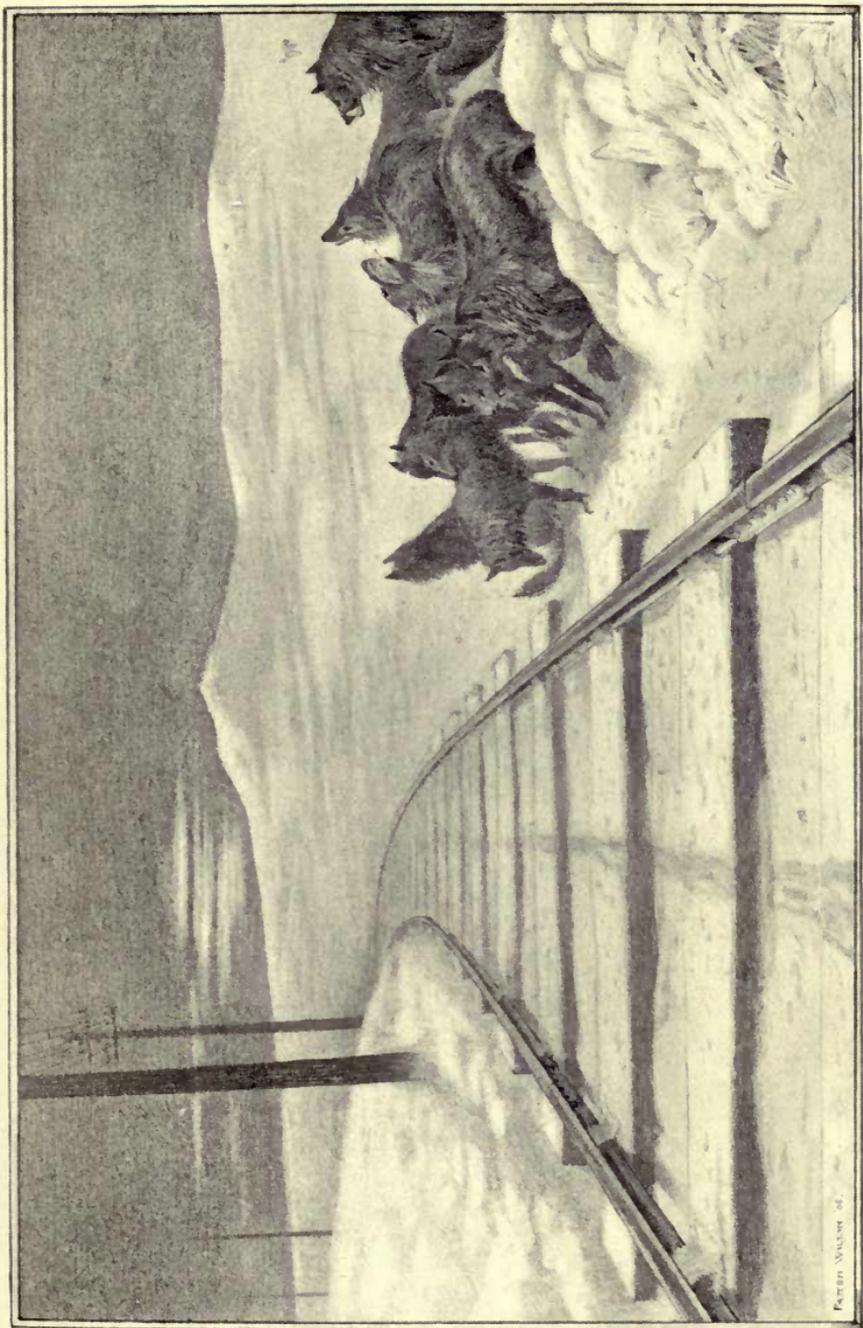
THE railway fauna, other than the horses used to shunt the trucks, is an amusing growth of recent years. Numbers of animals which at first resented or feared the trains have now become railway volunteers or hangers-on in some form or another. Most of them, like the visitors to Mr. Dooley's bar, come there for refreshment and change. But some have taken to the iron road as a regular means of getting a living, or of adding to their resources. There is hardly a country in the world in which some wild creatures are not regular waiters on the trains, or haunters of the line itself or of the stations. The earliest impressions excited by the railway on animal minds are not always favourable. The buffalo used occasionally to charge the cars of the trans-continental lines in America, and a male wild Indian elephant fought with, and was vanquished by, a contractor's engine. When the first of all Indian lines was opened from Burwan to Calcutta, a holy Brahmini bull conceived that the engine was in some sense an outrage and gave it battle, with disastrous results. Some fear was felt as to the effect which this untoward incident might have on the people, whose sacred animal had

been killed by the new invention. Fortunately, the popular interpretation of the omen was in favour of the engine. They made offerings to it, and decorated it with flowers, as being the stronger divinity.

But after these early misunderstandings the animals make the best of the railway, and in time find it one of their best friends. Sometimes they actually take toll of the railway. An amusing case of this sort was recorded by Mr. Walter Scott, at one time manager of the Mauritius Government Railways. "Trains of sugar-canes, loaded in open-sided trucks, were worked over a section of the line from the plantations to the *usine centrale* some miles distant, and the three first miles of the single-line railway passed through a forest with trees quite close to the rails, up a very steep gradient, and round sharp curves. When the first down passenger train from Port Louis had passed the crossing station, the loaded cane train was despatched towards the summit. In the meantime, some monkeys in the forest had timed the passage of the descending passenger train, and had fixed sentinels who signalled to their expectant comrades on trees the approach of the cane train. As the train went crawling up the incline a troop of monkeys sprang upon each waggon, ten forming the train, and threw off quite a goodly number of canes, which were gathered up as the train slowly passed onwards. These depredations became so serious that the planter appointed a watchman to patrol this 'length'; but the *malgaches* have a superstitious dread of killing a monkey, which they term *di monde même* in Creole. The looting of these trains

by these marauders was, however, ultimately stopped by other means."

When Dr. Vaughan Cornish was on the Canadian prairies studying the forms of snow and snow-waves, which formed the subject of a paper read recently before the Geographical Society, he observed that the railroad had entirely altered the habits of the wolves in winter. Formerly, in the days of the old waggon teams and "prairie schooners," the wolves used to follow the camps across to the great West, just as they followed the buffalo herds, stealing all the stock they could, and picking up the leavings of the camp fires, and even eating the saddles and harness of the mules. Now they come down to the Canadian Pacific or the Grand Trunk line, and watch for the trains. A trans-continental train is like a ship. Eating and drinking must go on at regular hours. The passengers consume three solid meals a day; the black cooks and waiters have theirs also; and plenty of spare food, bones, bread, and trimmings, is thrown overboard. In the grey cold dawn the hungry coyotes, their tails tucked between their shaking legs, may be seen standing in the snow, with their short ears pricked up like an anxious terrier's, waiting to see what the morning's "clear-up" of the cars will cause to be thrown out of the windows for deserving prairie dwellers. Sometimes a great grey wolf, the very personification of cold and famine, is viewed sitting by a sage bush, in the drift of snow powder lifted before the icy morning wind, his long sharp nose uplifted in line with his spine, the cutting blast ruffling up the fur on his back, waiting



“IN THE COLD GREY DAWN, THE HUNGRY COYOTES WAIT TO SEE WHAT MAY BE THROWN FROM THE WINDOWS OF THE CARS FOR DESERVING PRAIRIE DWELLERS.”

for the sun to rise and warm him, and for the train to pass and leave him a beef-bone to take the edge of hunger off. Something of the same kind happens along the Siberian Railway, where the steppe jackals and foxes are always more numerous round the stations and along the sleeping sidings than elsewhere, and in India the jackals regularly visit the line on the way home from their nightly prowls.

On our southern railroads leading to Folkestone and Calais a very considerable amount of food is also consumed, with its due percentage of waste. Very few people fail to provide themselves with solid refreshment when about to cross the Channel, which provisions they consume, or throw away, from a pious feeling that they had better make the best of the good things of this world before venturing on the horrors of the "middle passage." The section of the line at which the psychological moment usually suggests itself that it would be well to eat luncheon or tea happens to be near some covers where pheasants are preserved. The birds have found this out, and regularly hunt that part of the line for sandwiches, biscuits, and bits of bread-and-butter, so much so that they are occasionally killed by the engine. In the same way, country people coming up to London nearly always bring large provisions of food to consume on the journey. What is not eaten is left in the carriages, and swept out at the termini. Thus it happens that nearly every great London station provides unlimited free meals for railway rats. If any one has the misfortune to have to await the arrival of a midnight or early

morning train in town he will hear these rats scampering about over the metals and cheerfully squeaking. At Victoria and some other London termini a staff of station cats maintains itself mainly by catching the rats which live under the platforms and feed on the fragments left in the cars by *bonâ-fide* travellers. But these very irrepressible rodents seem to flourish in considerable numbers in spite of them. Not long since, when we were returning to town from a weekend shoot accompanied by a good deal of ground game and a retrieving setter, the dog was much admired by a Cockney porter, who "supposed it had caught all them hares and rabbits." We explained that this would have been scarcely correct, but that the dog had been a great assistance in killing and collecting the game according to more orthodox methods. "Well," said our friend, "I only wish I'd got one like him to help me kill the *rats in that tunnel*. I can tell you, sir, there's such a lot of them, and such big ones, that I am downright afraid to go there at night!" On the Great Western line in the Vale of the White Horse, and probably in many other places, foxes, carrion-crows, and rooks habitually come to the line for food. The foxes regularly hunt down the embankment, just under the telegraph wires, looking for the bodies of birds which have been killed against the wires the previous day or during the night. It is not hard work for a fox to hunt along three or four miles, and he is very unlucky if in that distance he does not discover two or three dead birds, larks, turtle-doves, partridges, water-hens, and fieldfares being

those most often found at different seasons. Half-wild swans which frequent the reclaimed Brading Haven in the Isle of Wight are frequently killed or injured by flying against the telegraph wires along the railway line which crosses the marsh. The speed and force with which these birds fly is shown by the very severe injuries so received; some are killed outright, and others have cut a wing off as if it had been done with a knife. So many birds were lost in this way that the wires have now been hung at intervals with small pieces of metal to make them more easily visible, and this appears to be successful. But swans are singularly stupid birds, and they occasionally get killed by the trains on the same piece of railway line. It is only a single line, but not long since a couple of cock swans chose to fight a duel between the metals, and declined to move when a train came in sight. The engineer blew his whistle and did all he could to frighten them, but as it is against the rules for a passenger train to stop under such circumstances, he was obliged to go on over the swans, and one of them was killed. The other, nothing daunted, remained on the line to triumph over his fallen rival, and when the train returned half-an-hour later he too was run over and slain. And in death these valiant warriors were honoured and united, and, like the cat in the nursery rhyme, "went to London to see the Queen"—for their beautiful skins were made into a swan's-down wrap which was worn at the first Court of the season. The crows along the Great Western Railway come to catch the young frogs and

toads for which the line is a regular trap. They are hatched out in thousands in some pond or ditch, and when about an inch long try to migrate to the canal or ponds on the other side of the line. There they are stopped by the metals. If they can crawl over the first line, they generally fail to manage the next, and are there gobbled up by the carrion-crows by dozens. The rooks are far more civilised, and consequently bolder, than the crows. At the little country stations they fly down after each train has passed and hunt not only the line but the platform. The writer saw a pair quietly searching for fragments of bread and biscuit among the milk-cans on the platform of a small station not two minutes after a train had left. Railway cuttings are favourite haunts for very many British birds and many of our smaller animals, just as the slopes of embankments and cuttings are favourite ground for certain flowers. The railway cutting is as attractive a home as an old quarry when once the creatures have learnt not to mind the trains, offering much the same warm slope to the sun, shelter from winds, and for the burrowing or hole-using creatures a convenient "face" to work at. Sand-martins more particularly haunt the cuttings, both to nest in and to feed on the flies and gnats which gather there. Pipits, larks, robins, whinchats, and other ground-building birds nest on the embankments, and use the telegraph wires as outlooks and resting-places.

Rabbits, too, are especially fond of burrowing in the cuttings, and pheasants like to sun themselves and hunt for ants' nests there. We have seen a covey

of partridges dusting between the sleepers, and they appeared far less alarmed by an approaching train than they would have been if a man or a dog had come along the line. Indeed, they did not get up till the engine was upon them, when it seemed impossible that all could escape unhurt. But a search on the line after the train had passed showed only one or two feathers dropped by the birds when dusting.

Some birds have a perverted liking for actually nesting in old railway-trucks, or occasionally in those in use. Water-wagtails are the commonest experimenters in this department of animal railway life. They have been known to follow the truck when moved to another station; but whether they would ever try to sit on the eggs unless the truck were returned to the place from which it was moved is doubtful. Barnes railway bridge on the Thames is a very favourite nesting site with house-martins, which build in great numbers among the iron supports beneath it. Why the eggs are not "addled" by the constant vibration of the trains passing only a few feet above them is an unsolved mystery; but as the birds have built there for many years, it is evident that they consider the position a good one. On the Uganda Railway it might be expected that the great herds of wild game of all kinds found along some parts of the line would have moved off at once to a distance from the track. When hunted they do so. But it was observed that the trains themselves caused them very little concern. Some species used the track as a path. Others fed without moving

within sight of the engines as they passed by. In one case a photograph was taken of a herd or string of wildebeest, or brindled gnus, moving parallel with the line on open veldt. This herd, moving in single file ahead with irregular intervals between the animals, did not change its direction as the cars ran parallel with it, and was computed to have been nearly four miles in length.

CHAPTER IV

ON THE MARCH

SIR JOHN OGLANDER, writing of the manners and customs of the Isle of Wight in the days of Charles I., quaintly remarks that persons out of "owre island" who undertook a journey to London always made their wills first, "as reckoning noe trooble like to travel." Many people still take the same view as was then held by the islanders. But the trouble of a separate journey is nothing as compared with the march of organised bodies who have to provide their own commissariat and transport. That is where Western nations usually break down, though in the East the business is better understood. Xerxes could never have marched and fed his million men through Thrace to Greece if half of them had not belonged to the "caravanning" races. Animals on the march often manage these things better than men do. Generally speaking, they go worst if driven, better if ridden, when man becomes a part of the animal, and best when left to themselves. Compare, for instance, sheep driven along a road with the same animals changing pastures voluntarily on the hill, or horses in a drove with others ridden in a march of cavalry, or a troop of colts galloping in the breeder's paddock. The marches of the larger

quadrupeds have many features in common. Long journeys in great numbers are, or were, undertaken by the spring-buck, the American bison, the musk-ox, and in smaller bodies by wild horses, and the antelopes of the steppes. All these, with the exception of the musk-ox in some of the mountains of Alaska, make their journeys over plains, the spring-bucks over the veldt, the bison on the prairie, the musk-oxen on the "barren lands," the horses on the pampas, the antelopes on an absolutely flat steppe. They are therefore free to choose their own order, and like the migrating hosts of Tartars, the majority of them usually move on a wide front. In this order they avoid the constant strain on the rear ranks of closing up in a hurry, which is one of the standing difficulties of calvary marching along roads. The German cavalry under Von Radowitz tried the experiment of marching for a whole day in extended line. Owing to the difficulty caused by obstacles, the experiment was abandoned, though the French cavalry in their manœuvres still practise this, to them, most difficult form of advance. For animals it has another advantage. When halting to feed they can browse straight forward in line, on grass untrodden by animals in front.

The march of the spring-bucks shows far the largest bodies of large mammals to be seen in movement at the present date. This, however, is not an orderly progress. The herds are under no control, and move on in a dense body, the centre packed close and the flanks in loose order. Neither is facility for feeding secured. The Dutch hunters say that the animals in

the rear of the herd are thin, those in front having eaten all the grass, and that at the change of the monsoon, when the spring-buck columns turn north again, these become the leaders, and take their turn to fatten. Two species of bird habitually march great distances, and in numerous bodies, but there is a difference in the method and intelligence shown in their travels. The guinea-fowls travel in troops often numbering over a hundred; but, like true Africans, they always walk in single file, making their way through the scrub or forest down to the drinking-place in the same primitive order as that in which the African caravan crosses the continent. The single-file order has only one advantage. It saves the trouble of widening paths—wherefore the whole Central African region is connected by paths nowhere more than eighteen inches wide. But the results are worse for the African than for the birds, for the slightest obstacle causes a halt and a break in the line, and the rear must constantly be hurried up after stoppages. To the guinea-fowls, almost the most active of ground birds, this habit of closing up has become a kind of conscience, as any one may see who watches the eager, craning anxiety of a tame brood to keep in touch even when running across open ground. The guinea-fowls' march is thoroughly African—non-progressive and uninstrucive. Contrast with this the orderly progress of the wisest bird of Europe, the goose, when travelling in companies. There are times when wild geese, some of the strongest fliers among the large birds, travel great distances on foot, some-

times to accompany their young, sometimes because they are moulting. Mr. Seebohm witnessed the passing of a goose-column when exploring the tundra. They came on in column, the old birds leading, and after crossing the Arctic moorland, descended to the river, and took the water in the same order. Large, heavy birds like geese could not possibly march for long distances unless their method and order of march were carefully thought out. That the average intelligence of these birds is very high is generally acknowledged; but it is nowhere so well shown as when they are travelling on foot. In the first place, there is no hurry—every one goes his own pace, but that pace is deliberate. They walk in column, but the ranks are often ten geese wide. No goose touches or jostles his neighbour, and all the heads are carried high, so as to get the maximum of air. At regular intervals on the march the column halt and feed, spreading out in lines for this purpose, but falling in at a proper signal from the leaders. The writer has often watched these proceedings when a large flock of geese has been crossing Port Meadow, the wide green flat above Oxford. But their marching powers have been well known in “the trade” for centuries, and are still made use of abroad. At Antwerp a flock of three thousand geese has been seen to walk along the quay, gently urged by some Flemish gooseherds. They were halted opposite to an English steamer bound for Harwich, and then crossed three abreast on a plank with low canvas sides on to the steamer. They then walked along the

deck, descended a steep sloping plank, and marched along the lower deck into an enclosure, where they remained during the crossing. At Harwich they were driven up the plank to the upper deck, off the ship and into pens, where it is to be feared most of them were killed for market. This is only a survival of the old system by which the Norfolk geese were driven up to London in thousands without losing condition. It paid better before the days of railways to let the geese transport themselves. The largest drove mentioned was one of nine thousand which went from Suffolk, through Chelmsford, and on to London. As "a cart," not carts, was provided to pick up the lame ones, the number who fell out must have been surprisingly small. It may be doubted whether nine thousand creatures of any other species could have made the journey of a hundred miles with so little trouble. They took their journey easily, marching ten miles a day. The ordinary day's march of the German army is thirteen miles—only three miles better than the geese. But these are the champion pedestrians of all birds. When Lord Oxford bet the Marquess of Queensberry that a drove of Suffolk geese would beat an equal number of turkeys in a walk to London, the geese won by forty-eight hours.

Possibly the marching powers of geese are a legacy from ancestors which could not fly at all, and were entirely dependent on their legs as a means of progression over land or water. For, judging by the very late development of the wings in goslings as well as

in ducklings and cygnets, their forbears must have been almost as wingless as the apteryx is to-day. It is common knowledge that when fattening ducklings for market, the birds should be killed while still in the down, and when the exhausting process of feather-making has scarcely begun. But it is probable that it is the development of the wing bones quite as much as of the feathers that for the time affects the condition of the birds. In the case of some cygnets which the writer had under close observation for several months, the wings were quite rudimentary till the birds were nearly three months old, and about half-grown. When they did begin to develop, the wing bones grew at an almost incredible rate; in one case each wing grew over five inches in length in seven days. The wing feathers grew little until the bones were almost fully grown; then they too grew very rapidly, and by the time this bird was five months old they measured eight feet from the tip of one wing to the tip of the other. Beautiful as is the modern swan in either air or water, its slow rolling gait on land is certainly not that of a champion pedestrian like its cousin the goose; yet if the life-history of the individual is an epitome of the history of the race, its ancestors must once have been numbered among the birds which could march.

Mr. John Guille Millais, in his book on the African veldt, tells how he once overtook an army of ants on the march.

“It was about as like a regiment on the march as anything could possibly be,” he writes. “As nearly

as I could estimate the number, there were about two or three thousand big ants, and all were formed into 'fours,' though in military phrase the 'fours' did not keep their 'dressing.' The outside members of each 'four' never moved from their position, but the insiders constantly kept changing places across the column. They moved along like a huge black snake, and were led by a single ant, who examined the ground like a scout, while the column implicitly followed his movements, and apparently his directions." Four times Mr. Millais picked up and threw away the leader, and thrice another came forward to take its place, when the army, which had halted, resumed its march.

Commissariat, the curse of armies on the march, presents few difficulties even to vast moving bodies of animals when wild. Almost the only creatures which are noticed to suffer from hunger in these journeys are the migrating lemmings and, as mentioned above, the rear columns of the spring-bucks. This is because the travelling animals are all vegetable feeders, and move as a rule in the direction of an increased food-supply—the musk-oxen travelling south in winter, and north when the Arctic summer uncovers the tundra, and the animals of the veldt or prairie advancing or retiring over their feeding-grounds when plenty follows rain or scarcity follows snow. Where this natural commissariat is not available, Nature has to overcome the difficulty by very specialised means. Many birds feed up for days before the effort of the over-sea migration flight, and

carry their food concentrated, in the form of fat. The submarine "march" of fish is probably the only movement of great bodies of animals which is absolutely without trouble to the movers. With their bodies poised in water, with no effort except that of leisurely, almost effortless, propulsion, with the invisible and everlasting food-supply of *entomostraca* suffusing the medium in which they move, with no waste of force in wave-making, and almost no surface-friction of their smooth bodies on the surrounding water, their "march" is a triumphal procession, so far as triumph can be claimed by an almost complete victory over all the difficulties of travel.

CHAPTER V

ROAD-MAKING ANIMALS

TRESPASS by animals, and disputes as to rights of way, are among the commonest subjects of discussion in papers devoted to country life and amenities, for few animals recognise the authority of the Ordnance Survey, or acknowledge any boundary which is not marked by a strong fence. But in spite of the aspersions of the "Bad Child's Book of Beasts," the Welsh mountain sheep appear to be especially gifted members of the ovine race, and as such have actually obtained legal recognition of their capacity to distinguish boundaries and assert rights of way. On certain farms the flocks know the boundaries of their mountain pastures, and presumably transmit this knowledge to their lambs. They also maintain their rights against intruders, and if they meet trespassing sheep on the paths which generations of flocks have worn on the mountain side, they do battle with the interlopers, and if possible knock them down the hill. This sense of locality augments the value of flocks bred on these hills, and the enhanced value was settled at Dolgelly Assizes as half-a-crown per sheep.

We should expect this assertion of rights of way by sheep, though their knowledge of boundaries is more

difficult to account for. Sheep have for unknown ages been the great path-makers on mountains and downs, and have left their mark on the faces of the everlasting hills. The sheep-walks are only made intentionally in so far that the flocks, having once settled which is the shortest, easiest, and best route across these roadless hills, never seem to abandon what their reason has decided to be the best. Out on the hills these animals are almost in their primitive condition before domestication, and not the least interesting feature of their conduct in this relapse to the wild life is, that in spite of the highly artificial conditions in which they live to-day, they retain the primitive instincts of their race. That this "peremptory and path-keeping" impulse is part of their early instinct is clear from an account of the habits of the musk-ox recently written by the *Times* correspondent in Canada. The musk-ox, the *ovibos*, is as much akin to the sheep as to the *bovidæ*, and in habits more like what we imagine the undescended great original of our sheep was than are the wild sheep of to-day. It *naturally* assembles in great flocks, and is migratory, just as all the domesticated flocks of Spain are, and those of Thrace and the Caspian steppe. These flocks of musk-oxen always return from the barren lands in the Far North by the same road, and cross rivers by the same fords. Nothing but too persistent slaughter at these points by the Indians who beset them induces them to desert their ancient highways. Pictures and anecdotes of the migrations of these animals, and of the bison in former days, represent them as moving on

a broad front across the prairie or tundra. The examples of most moving multitudes suggest that this was their formation when moving slowly forward, feeding as they went, but their roads prove that at other times they moved on a narrow front or in file, just as domestic cattle do to-day. A herd of cows going home to be milked naturally walks in a long, straggling line, one behind the other, and when going to drink at a pond they keep more or less to the same formation. Where the Eamont River flows into the Eden, the banks at the waters' meeting are flanked on the Cumberland side by a very large, flat meadow, hundreds of acres in extent. This is never mown, but is grazed year after year by herds of young store cattle. The bank is steep and overhanging for the greater part, so that large animals can only go down to drink at one or two spots, and narrow tracks, just like big hare-paths, run from different parts of the meadow and converge at these watering places. These tracks are of exactly the same width throughout, some eight or nine inches, which gives just room for one hoof to pass the other, but is too narrow for a man to use with comfort. They could not be mistaken for human footpaths, as they are far more sharply defined; and there are no secondary side-paths, as in tracks made by the white races of mankind, which, unlike cattle, have a strong preference for walking at least two abreast. On the North American prairie, though the bison is extinct, the bison roads still remain as evidence, after the destruction of a species, of some part of its habits. These "trails"

are paths worn on the prairie, nearly all running due north and south (the line of the old migration of the herds), like gigantic rabbit-tracks. They are hard, the grass on them is green and short, and, if followed, they generally lead near water, to which a diverging track runs from the highway.

It is pleasant to reconstruct in fancy the life on this great animal highway, before the Indian invented the arrow to destroy and torment the moving tribes of beasts. Doubtless, in their unresponsive way, the creatures felt the usual emotions of travellers on a known and pleasant road, looked forward to their halts for food or détours for water and bathing, and recognised or longed for pastures and retreats which they had visited yearly as their manes grew shaggier and their frames more ponderous and robust.

With the sheep-tracks and the buffalo and musk-ox trails may be compared the main roads used by very many graminivorous animals, from those which the hippopotamus cuts through the gigantic reeds fringing African rivers to the hare and rabbit highways on our downs. The *main* roads of the hares over hills are almost as permanent as the sheep-tracks, and must not be confused with their paths to temporary feeding-places or the shelter of crops. In the same way the regular step terraces on the sides of chalk downs, though often made by sheep, are not roads, but feeding-places. As a sheep walks on a steep slope it always grazes on the ground on the side *above* it. Its neck would not reach that on the lower side. Consequently sheep work backwards and forwards on

such slopes, like a reaping-machine, taking about a "neck's length" in width each time. This measurement will be found to correspond pretty accurately with the steps on sheep-downs.

Field-voles make their roads by sinking cuttings; moles make underground highways, which are quite distinct from the tunnels formed in hunting for food; trapdoor-spiders make gates, and other spiders form suspension-bridges; but no animal has yet thought of forming an embankment, on which to run a road over wet places, or of building elevated roads, though arboreal creatures are very ingenious in making use of the interlacing limbs of trees for travelling on, and have regular highways from tree to tree.

Even in so simple a matter as road-making there is room for diversity in the motives of the constructors. It will be remembered that among the items of expenditure debited to the account of the firm of brigands directed by the *Roi des Montagnes* was that of mending the road to Thebes. It had so fallen out of repair that travellers declined to use it, and "business" in this part of his dominions had fallen off. Though not rivalling the powers of foresight possessed by Hadgi Stavros, some animals do put their roads to uses more complex than mere ease of travel. The most sinister purpose for which a seeming roadway is constructed is devised by certain spiders. The species in question frequents sunny heaths, commons, and furze brakes, and selects by preference some portion of ground which has been trenched by a field-vole or mole. Frequently these

animals make a half-burrow or open excavation—the former by biting the lower stems and roots of the rough grasses away, and the latter by tunnelling with their backs level with the surface. These open trenches, as the vegetation wears away from above, are occupied by big spiders, which cover the bottom with curving sheets of web woven close like silk. At the end, perhaps four or five inches from the beginning of the trap, they form a continuous, funnel-shaped arch of web, in which they lie hidden. Grains of earth and seeds of grasses fall on to the open trap, which looks like a nice even little road, leading to a hole. Insects of many kinds see this smooth, groove-like path, and attempting to run along it, are entangled, and then pounced upon by the spider. Even a mouse is embarrassed if it is frightened into one of these trammel-roads hung with “toils” of web.

Great numbers of industrial insects make paths for use on expeditions which involve the transport of all kinds of loads. But it would be difficult to name a single instance in which they consciously *improve* the road to facilitate traffic. The roofed paths of many African ants are not rationally designed for this purpose. The roof is mainly intended to keep off the sun, and to enable the creatures to work in the darkness or twilight, which seems a necessary condition for their activities. It has also a secondary and important use in protecting them from the attacks of birds. But ants in general are bad engineers in the road-making department. They do not clear away obstacles, but climb over or round them, and though

able and willing to combine, do not seem to realise that co-operative road-clearing would help the community in general. The late Professor Drummond noted the same idiosyncrasy among the natives of Central Africa. Thin, narrow little footpaths cover the whole central continent, like rabbit-tracks, but even a moderate-sized stone or a bush is left *in situ*. No one clears away the obstacle, and the path goes round it.

In contrasting the intelligence of other animals with the activities of insects, those creatures, mainly rodents, which form winter stores of food, and transport this from some distance to the hoard, naturally suggest a parallel. As a rule, the objects which they transport are light and small in size, such as beans, kernels, nuts, and grain. These need no roads for transport, and the paths of the ground squirrels, hamsters, and mice which carry them are mere tracks. Two rodents do make and improve roads for transport. Rats, when established in buildings, will steal and drag home objects as large as a dumpling, or a big turnip, or potatoes. To drag these to their retreats they will at once, and rapidly, enlarge narrow points in their passages, or gnaw away obstacles. But this is only rough road improvement, and extemporised on special occasions.

Beavers, the only warm-blooded animals which habitually do heavy transport by land, provide for all contingencies by cutting "rolling ways," biting off all stumps and obstacles, and do their log-rolling along these towards the water. There is very little

doubt that, were it at all necessary to their comfort, other animals would have hit on the same expedients. Beavers have three kinds of roads—their ordinary tracks near the water, their canals, and the log-rolling roads. This is quite in accordance with the very high degree of their social development as compared with other animals. Variety of roads is a mark of progress among the beasts as among men. Even in Europe there are many degrees of this exhibition of civilisation, and oddly enough the Dutch, a semi-aquatic race, are the representatives of the beavers among mankind. On the route from the Hague to Scheveningen, for instance, there lie parallel to each other a carriage road, a canal, a bicycle track, a light railway, side-paths regularly constructed, and in places little tracks or “Katz-passen” made by trespassers.

CHAPTER VI

LANDSCAPE GARDENERS

THAT changes in successive generations of animals are largely due to the influence of their environment, is a generally acknowledged fact; but it is equally true that animals are often directly responsible for changes in their own surroundings; and the alterations so produced sometimes remain in evidence long after the species to which they are due has disappeared.

The bison of the North American plains has ceased to exist, but the pathways of the once innumerable herds remain. In "The Deserts and Forests of North America," Mr. Paul Fountain writes:—

"The plains are deeply scored with tracks, even to this day, worn during countless generations by the bisons, which seem always to have followed the same routes in their migrations and wanderings. These tracks are likely to endure, for the bison, with wonderful sagacity, chose the easiest and safest paths, avoiding barren bogs and crevices, so that travellers invariably follow them. So deeply are these tracks worn that, even if they were not kept fresh by the frequent passage of horsemen and waggons, many years would elapse before they were obliterated; indeed, they may possibly be traceable for ever." But

the most marked and widely spread change in North American landscape directly due to animal agency, remaining permanent after the authors of it have been almost entirely destroyed, is to be seen in the "beaver meadows." These are found scattered over the whole of the continent north of New York and east of the Rocky Mountains, and are referred to in ordinary business terms, as when, for example, such land is put up for sale. The beaver meadows were made in two ways. Some were formed above the gradually silted-up "dams," which the beavers made wider every year, but could not build up vertically beyond a certain point. The other beaver meadows were originally flat forest by the side of the streams on which the beavers lived. They cut down every tree on these flats to build their dams or to feed on the bark, and often cut canals across the ground. They also cleared away all small timber and bushes between the stumps, that they might roll the "logs" to the water. Then deer came and regularly fed on these clearings, keeping the grass fine, and thus the beaver meadow was formed.

Another change due to the agency of animals is seen in the water-pools of the Kalahari Desert. These in most cases owe their shape in great measure to the use made of them by the larger animals, once so numerous in that region. During the rains, the game scattered over the whole country. But in the dry season, when the only water available was found in these pools, the elephants, rhinoceroses, and other large game, by constantly wallowing in them and

using them as baths, made the sides steep and circular, and thus gave a uniform character to the pools. They also carried off a quantity of the mud on their bodies, and so helped to keep the "pans" deep and prevented them from silting up. Access to the pools was generally between two large rocks, the path being worn into a deep roadway by the animals that came to drink.

Here in England the continuous or permanent marks left on the landscape by the larger animals are very noticeable. The peat-beds on the Kennet near Newbury were very possibly formed by the dams made by beavers, as the remains of those industrious predecessors of Sir Benjamin Baker have been found in them; and though this country shows nothing quite so curious as the paths of the dwarf cattle of the Indian hills, paths which, seen on the slopes from a distance, seem to cover them with a kind of scale pattern, nearly all our steep downs and pastures, other than those on mountains and fells, are worn into little shelves by the sheep. For unknown ages these creatures have pastured on the slopes, and on the steeper ones have worn these paths, on which they stand while grazing the turf sloping just above them. They make tracks on the mountains and fells too. But there the land is so broken by rocks and boggy patches that the effect is far less striking than on the chalk downs or the marly sides of Devonshire hills. In all our parks and meadows the browsing of cattle has produced a curious uniformity, by causing what is known as the "cattle

line" in trees. In any park where there are a number of trees of less than sixty years' growth, especially limes, elms, and ashes, it will be noticed that the height of the lower branches above the ground is uniform. They are as neatly cut away below as if by a woodman with shears. This is the work of the cattle, which regularly browse the shoots and twigs as high as their heads will reach.

It will be noticed that where bushes or boughs hang over the pavement in London, especially in a new street, these are all cut back to a uniform height, which is the level that clears the tall hat. It is quite possible that in provincial towns, where tall hats are not in daily wear, the line descends an inch or two lower.

Where horses, which have a much higher reach than cattle, are kept in parks, the browsing limit is much higher, and more irregular than in cattle-fed parks. A minor effect on park landscape due to the animals contained in them is seen in the nature of the fences. Where red deer are kept the fencing is at least eight feet high; that for fallow deer is reduced to six feet, or six and a half feet; while where cattle only are kept an ordinary hedge is usually sufficient. Our domestic cattle are also responsible for the thirty thousand miles of quickset hedges and railings along the sides of our railways, on to which they would otherwise stray and cause accidents.

In wild England the most striking contribution made directly by the larger animals to scenery is the

formation of the exquisite "lawns" of the New Forest. There the cattle are the landscape gardeners, who, somewhat to the detriment of timber, but to the great advantage of the beauty of the forest, have kept the glades and grass-grown greens from being filled up with bushes, shrubs, and briars. The bite of the hungry cattle has century after century cropped the natural increase of young seedlings level with the earth, while their tread has made the grass compact and close. They have also kept it short and sweet up to the very bases of the columned beeches, whose grey stems rise from the velvet sward set round with violets, primroses, and a thousand tiny leaves and blossoms which never could have flourished but for the light and air which the forest cattle unconsciously secure to them. The open glades and lawns seen at their best in the New Forest are common to all forest land where cattle have long been allowed to pasture. In the clay forests, such as Epping, these lawns are scarce, because the indigenous shrub and undergrowth is thorn, almost the only bush which cattle find too prickly to chew. Pasturing grass-lands with certain kinds of stock induces a different growth of minor vegetation. In the Vale of the White Horse, for example, there are large tracts of meadow-land in which horses should never be turned out. Where they are nettles always grow. The experiment of keeping horses entirely away from these meadows has been tried for many years on a certain large estate, with the result that there is now scarcely a nettle-bed in some five hundred acres of this grass-land. The

ordinary management of sheep on down-land prescribes that they shall be fed on the thin chalk-turf, and folded at night on the arable land. The experiment was tried of folding them on the down, in the hope that this would cause richer pasture to appear there. Instead, a rank growth of the most undesirable, sharp-edged, tussocky "rubbish" grasses sprang up, and on one or two spots known to the writer has remained, spoiling that portion of the downs for twenty years.

Among the unpaid gardeners who keep certain parts of our landscape trim must be reckoned the humble rabbit. "Rabbit turf" on the juniper-studded slopes of the Surrey hills, or the verges of the Devonshire cliffs, is almost the finest sward existing. The constant nibbling of the rabbits, which work steadily outwards from their burrows, cropping the grass again and again closer than does a mowing-machine, dwarfs not only the grass, but all other plants and herbs. They also nibble the furze-bushes and bunches of heather into cushions and blunt cones, and give to the ground which they frequent the appearance of being covered with artificially rounded and trimmed shrubs and bushes, an effect which the large number of ant-hills, so characteristic of the sides of downs, aids in producing. On some parts of the coast, especially in the sandhills which protect low lands from the sea, rabbits occasionally threaten to produce very much more serious changes in the landscape than this. They burrow into the sandhills and weaken them until they are no longer the firm barrier that they were. Over the whole of the coast of Holland the Board which

has control of the dykes and dams has plenary powers to enter upon any estate in the "dunes" fringing the sea, and then and there to kill, slay, and exterminate the rabbits without asking permission, if, in the judgment of its officers, they are weakening the sandhills.

As the cattle on the New Forest and the rabbits on the downs have dwarfed and sweetened the herbage, so the vast herds of wild game on the African veldt would in past ages have turned that fertile region into a grassy lawn were it not for the unfortunate cessation of almost all rain in the three summer months. During this time the surface becomes so arid that the tread of beasts, instead of compacting it, helps to disintegrate it and to destroy surface grass, and thus the veldt never becomes "turf."

Happily this is not the case with the clay steppe of the pampas, which Darwin saw and described seventy years ago. He saw the curious phenomenon of a land capable of supporting animal life in quantities almost without parallel elsewhere, a land where the natural grasses were hindered in their growth neither by shrub nor tree, and in parts only broken by brilliant flowers, geraniums, scarlet verbena, wood-sorrel, and *cœnothæ*, stretching like an Atlantic Ocean of green from the sea to the foot-hills of the Cordilleras on the opposite side of the continent. Nature seemed to have left out every product which could take up room which would otherwise be occupied by grasses. There were no useless rocks, and almost no stones; no trees, to kill herbage by their shade; few marshes or arid belts of sand or salt; no mountains. The steppe offered

spontaneously that monotony of feature which agriculture produces elsewhere after generations of labour. It was like some vast natural reclamation, made ready for the flocks and herds of a continent. Yet to consume this half-million square miles of food, instead of legions of bison and wapiti-deer, as on the Northern prairies, there were not enough native animals to crop the grasses. South America has no wild oxen, or wild sheep, or goats, or antelopes; and on the pampas and the Southern plains there was only one large native ruminant animal, the pampas stag, with the puma and jaguar, which have probably been attracted south by the increase of imported animals which serve them as food.

Darwin's belief was that this scarcity of animal life on these plains was also very recent, and that the splitting up of the continents of North and South America zoologically was effected by the rising of the high Mexican plateau, beyond which few Northern species wandered south. But since Darwin's day man has filled in the blank left by Nature with a fauna brought there across the ocean. These animals have multiplied faster than ever did the bison herds, and have changed, or are changing, the surface of the steppe.

Formerly the grey and misty levels of these plains showed in winter but little life except the scattered herds of wild horses, and the viscachas sitting by their burrows. Now on these chosen pastures the hordes of cattle blacken the plains.

That modification of the herbage which Darwin

noted as produced by cattle in the more populous and anciently settled territories has spread over millions of acres. On these the tall, rough grass, so high that cattle could not be seen in it unless the *gauchos* stood on their horses as look-out posts to gain a view, has given way to turf, close, compact, and of treble the nutritive powers of the unimproved grasses. The millions of sheep which it now supports, herded by dogs which have become almost part of the flocks, outnumber the ancient "treks" of the spring-buck of South Africa; and instead of the vast and oppressive silence of the plains, the lowing of herds and the bleating of flocks fill the air with sound.

CHAPTER VII

ANIMAL DEPENDENCE ON WEATHER

CONTINUOUS wet and darkness sensibly reduces the vitality of well-housed human beings and disposes them to sickness. How then do the animals, which have no protection from the weather, or a foot of dry soil on which to lie or stand, endure week after week of damp and cold? The answer must be that they endure it how they can, but that of all conditions of weather, rain and damp are those most injurious to them.

From the sheep in the sodden folds to the deer on the Highland hills, all suffer. Even the common remark that a wet day is "fine weather for young ducks" 'is wrong, for in the very wettest summers of the last ten years nearly all the young ducks died. One heavy shower is often sufficient to kill young water-birds that are exposed to it. Their breasts are covered with a dense coating of springy down, which holds the air like patent "cellular" underclothing, so that the ducklings float on a kind of lifebuoy and waterproof combined; but their backs are not so well covered, and a very little wetting from above is fatal to them. A charming picture, sketched by Mr. John G. Millais at the side

of a Highland loch, shows how carefully wild-duck mothers guard their broods against the rain. A sharp shower has whitened the waters of the lake, and all the little bee-like ducklings have been hurried to the shore, and crowd round the old ducks, which stand with wings outstretched shielding the babies from the pelting drops.

Frost and snow, if only there be food, seldom injure any creatures but the small birds. Sheep will grow fat in a frost, even though the snow is lying unthawed on their thick, oil-soaked, non-conducting fleeces.

Drought and dry heat always mean healthy seasons for all wild animals in this country, where food and water never really fail. Cows, ponies, and deer put on more flesh from a pound's weight of dried-up grass than from two of water-logged pasture, and horses which can take a roll in a dust-bath after a day in the sun are in better condition than after careful grooming following a day's driving in mud and rain.

Considering the dislike of animals for rain and its injurious effect on their health, it is curious that more have not learned to build houses of some kind. Besides the squirrels and the dormice, the orang-outang is almost the only mammal which makes a shelter from the weather, and that a poor one.¹ It is only their magnificent condition of health, due to their being all teetotalers and having to work for their living in the open air, that enables most land animals and birds to stand continuous wet.

¹ The holes of burrowing animals are used more as a refuge from living foes than as shelters from the weather, and such burrows are commonly full of water and uninhabitable in wet seasons.

Possibly the tropical winter rains of the central zones are less injurious to life than the cold rains and low temperature of temperate countries. In the Indian plains spring is dusty and barren. The sun brings heat, but only a life in death, for there is no water in the ground. The monsoon, when the Indian sky is filled with welcome clouds, brings freshness and life. The opening of the rains is the real beginning of spring. The plants grow so fast that you can almost see them, forced by the hot, almost fermenting earth. There is a prodigious birth of insects, followed by the destroying hosts of the carnivorous insects which feed upon them. "Eha," the Indian field-naturalist, considers that the first few days of the rains are the Indian counterpart of our opening spring days, so far as anything in England can find a parallel there. "Even the roadside rivulets are full of little fishes, come from I know not where, to grow fat on the worms and mole crickets borne helplessly along by the flood; and the fireflies light their lamps and hold their silent concerts, the occupants of each tree flashing in unison and making sheet lightning in the woods."

The rain cannot put out the fireflies' lamps; but after a few days of this intermittent downpour it is evident that the animals are feeling the effects of cold and damp, even in India. All creatures, from men to the white ants, begin in some way to show that it inconveniences them. "The fear of getting wet is universal. The gentleman runs because the rain will spoil his clothes. The coolie runs because he has none. When you realise that at this time all kinds of birds and

beasts, down to the flimsy butterflies and moths, live and sleep in the open air, you cannot help wondering how they manage when the station rain-gauge is registering ten inches in twenty-four hours." The smaller butterflies and moths of Europe can usually find sheltering places in rainy weather, but the broad-winged insects of the tropics are sadly damaged and reduced in numbers. The Indian birds, many of which lay their eggs during the first and heaviest month of the rains, also suffer considerably; and the monkeys, "huddled together with the water spouting from their long tails," while the deluge is running so fast down branches and trunks that the water may be seen throbbing as it slips down the bark in a thick glaze, must be miserable indeed.

Evidence of the danger to young animal life at this time is seen in the season at which the young of the Indian deer are born. In every country the females of all wild animals have adjusted the time at which they produce their young to the seasons. In all cases the mammals, more especially the larger grass-eating kinds, drop their fawns, calves, and kids at the time when natural food is beginning to increase, and when the bad weather is over. In temperate Europe these two periods are the same. Winter is over and food steadily increasing in early summer, and that is the time at which the doe and hind produce their young. If the rains, which certainly cause an enormous increase of vegetable food in India, were also favourable to health, we should expect the Axis hinds, for example, the typical jungle-deer of the peninsula, to drop their

fawns in April or May. But they do not. The fawns are not produced till after the rainy season, in October. There is no stronger proof than this that the rains, even of the tropics, are hurtful to animal life.

When wild creatures are partly domesticated or naturalised, the females begin either to disregard this seasonal law, or, if living at large, to change the period of producing young to suit the new seasons and climate.

But though the first and imperious instinct of preserving the young dictates these physical adaptations, in the ordinary matters of life they often do not learn to accommodate themselves to new conditions. The Sambur stags which the late Lord Powerscourt turned out in his glens and woods on the Wicklow Mountains persisted in lying in the thickest cover all day, trying to shelter from the Indian sun, though the trees were dripping with Irish rains and mist. Yet domesticated sheep will always go to the top of a hill to sleep at nights in the dry. In Dovedale the flocks climb in the evening literally to the summit of Thorp Cloud, and mark the skyline like a string of black beads against the setting sun.

The writer has no experience of the wild life of the parts of Lancashire round Manchester, one of the wettest areas of England, where, as Yorkshiremen say, there is no spring and no summer, but "all back-end"—*i.e.* autumn. But if rain is the main climatic enemy of animals in these latitudes, we should expect to find Ireland, the wettest of the three countries, and the west coast of Scotland less populous in species

and numbers of birds and beasts than the east coast of Scotland or Norfolk. And that is the case. The place of Ireland in the Atlantic and its severance from what was Continental England may account for the absence of some species. But climate must be held mainly accountable for the failure of introduced animals, such as the brown hare and perhaps the black grouse, to multiply; for the poor crop of partridges, and for the scarcity of birds like the red grouse, for which the heathery mountains would seem well suited. Speaking generally, Irish woods and mountains are curiously bare of indigenous life, though the migratory woodcock, and in the bogs the migratory wildfowl, find it a congenial winter resort. In the same way the mainland of the wet Scotch west coast has a smaller bird population than the east.

In this country wet springs and summers seem to affect most forms of animal life. In such seasons there are very few butterflies or moths. All young ground birds suffer, especially game. Rabbits and hares die of fluke and dysentery; calves, sheep, and lambs of various ailments. Myriads of wild birds' eggs are addled, or the young birds die in the nests. Even rats decrease. Fish do not thrive, because there are few insects, and kingfishers decrease on the Thames, because the wet soaks into the holes in which they breed. Strangely enough, the only animals which increase in numbers during a very wet season are the most homeless of all the beasts—the hares. It is true that a certain number die from diseases engendered by damp and darkness, but on the higher ground at

any rate their numbers are more than made up by the unusual number of leverets which in such seasons grow to maturity. Hares are always numerous on the downland round Lambourne and Catmore in Berkshire, but at the end of the wet season of 1902 they had increased enormously. In ordinary years many young hares are destroyed by plough and harrow in tilling the soil, but the weather had been so bad all through 1902 that field operations for clearing the land, and especially steam ploughing, were practically at a standstill for months; and the leverets were no longer sacrificed to Ceres.

There is reason to conjecture that a wet summer round our coasts actually reduces the number of fish in the sea, and marine life generally. This may seem a paradox, but it is borne out partly by the increase of marine life after dry years, partly by the recent discoveries as to the hatching and life of the spawn and young of sea creatures. The season of the year 1900, for instance, saw the most teeming marine life known for years round our shores. "But the early summer of 1900 was exceptionally wet and cold?" Yes, so it was, and it destroyed the young partridges, rabbits, and wild pheasants. But the sea creatures are not made in one summer like the partridges. The herrings, of which the record catch was made, the bass which were caught in thousands off Dover, the innumerable cuttlefish off the coasts of France and Cornwall, the solid shoals of mackerel taken off the Irish shores, perhaps were adult fish hatched and bred in unusual numbers in *the three*

previous hot summers, when no cold rains were chilling the surface of the sea and keeping down its temperature. For it is on the surface of the sea that the untold millions of the eggs of most of the food-fish float, and it is there, too, that the minute creatures swim and breed, and lay their invisible eggs on which the fry of the sea-fish feed. Thus rain and cold may be as fatal to the life of the ocean as they are to life on the dry land. They chill the surface water, on which float the embryos both of fish and the food which ought to support them. Wet weather spoils even the harvest of the sea.

CHAPTER VIII

IN THE TIME OF FLOODS

IN England it is, as a rule, only the wild animals whose happiness and even lives are really dependent on the weather, but during torrential rains and summer floods the injury and destruction caused among domestic birds and beasts is often very considerable. For instance, during the second week of June 1903 some ten thousand homing pigeons were let loose on the south coast to fly home to various places mainly in London and the Midlands. They flew right into the heaviest continuous rainstorm of the last forty years. Two days later it was reported that nearly all these birds were lost, having failed to find their way home. At the same time the swallows, martins, and most of all the swifts, were gradually starving, as well as suffering from the cold and wet, throughout the days of downpour. The continuous heavy rain washed all the insects out of the air. After the first twenty-four hours there was no food left for the swallow tribe at all. The swifts, as a last resort, came down to the houses, flying round the eaves to see if a few gnats remained under the shelter of their projections. Their extraordinary powers of flight enabled them to keep up their ceaseless ranging of

the air in spite of the continuous downpour, which would have wetted the feathers of almost any other land-birds after such long exposure. In their hunger they flew, seeking food, long after dusk—until it was almost dark. But long before the rain ceased numbers of them gave up the struggle, and crept into houses, or were found clinging to walls, or lying dead at the foot of buildings to which they had clung when exhausted.

The destruction among late-hatched broods of wild-ducks was great. The loss among the young pheasants, mainly from the rains, but also from drowning in the case of the wild birds, was most deplorable. Four thousand young birds are said to have been found dead upon one estate.

Though swans, ducks, coots, and moorhens, which build close to the water-level, and even the little warblers whose nests are hung in the reeds a few feet above it, do not themselves perish in sudden floods, their eggs are destroyed by thousands. In the summer of 1902, when numbers of these birds were nesting on the banks of the little river Yar, which flows through the reclaimed marshes of Brading Haven, violent rains on the downs which form the "backbone" of the Isle of Wight filled the little river as suddenly as if it had been a mountain beck instead of a slow south-country stream. Even the swans, whose evident anxiety to raise their nests usually gives warning of a coming flood, were taken by surprise; and when in the early morning their keeper hurried down to the bank to help them, he

found the nests washed away, and ducks', teals', and swans' eggs floating all over the river.

When the rivers begin to flood in earnest, the scene of the deluge, if the district is an English one, is usually the flat meadows or marshes, and the animal victims are of all kinds and sizes, from field-mice to sheep and oxen, according to the depth of the waters and the nature of the ground.

Cattle are more often drowned in the marsh floods caused by exceptionally high tides flowing up estuaries, and so breaking embankments, than by ordinary river floods. They seem singularly helpless and frightened in such circumstances. It is almost impossible to drive them through the rising waters, even though it is quite safe for a mounted man to follow them. They huddle together on any piece of dry ground left, and are almost as loath to quit it as horses are to leave a burning stable. They lose any sense they have, even if they are induced to move. We have seen a whole herd of young bullocks, which were being driven off some dangerously flooded marshes when the tide was rising fast, walk not through the gateway, where there was a bridge over the dyke, though the water covered it, but straight into the deep drain above it, where several were drowned. It did not seem to occur to them to feel the depth with their feet, or to try whether there was firm ground or seven feet of water in front of them.

Marsh floods annually claim a great number of victims among sheep. In some of the Norfolk "meal marshes," which in summer are famous grazing ground

for the flocks, the numerous creeks are crossed by wooden sheep-bridges. In a marsh tide the sheep, if overtaken by the water, crowd on to these bridges, which are slightly higher than the adjacent levels of orach and crab-grass, and wait for the waters to go down. While the sheep take refuge on the bridges, the rabbits, which spread from the sandhills on to the banks in the higher parts of the marsh, climb into the bushes of that curious plant, the suaeda, to escape the water. The suddenness and depth of some recent floods may be gathered from the fact that in the valley of the little river Stort, between Essex and Hertfordshire, a hundred and fifty sheep were drowned on an ordinary Home Counties farm.

On flat ground nearly all the smaller mammals, except moles, but including foxes, climb into bushes and trees to escape the water. During a flood of the Trent near Clifton in Nottinghamshire, the hares were seen sitting up in the hedges, where they remained, and though screaming with fear, allowed themselves to be picked up from a boat. In the hedges there were also seen sitting rabbits, rats, field-voles, shrews, and occasionally a hedgehog. All the moles were drowned; but the weasels and stoats, which are excellent swimmers, made for trees, in which they were quite at home.

In the Thames Valley the thousands of pollard willows are the welcome and easily reached refuge of all kinds of flooded-out animals, including a considerable amount of insect life. The rats, in these hard times, eat the snails, beetles, and other refugees

which crawl up the trunks into the hollow crowns. The present writer once saw a flooded-out rat sitting on the top of a notice-board, the futility of which in flood-time has often been subject for jokes, but never more so than on that particular occasion, when lengths of deep and muddy water between hedges appeared labelled with the legend "Private Road," and the most conspicuous objects showing above the watery wastes on either side were the boards which proclaimed them to be valuable building sites.

The immolation of almost the entire insect population, and of a very large number of the mollusca and annelids, naturally follows the covering of large areas of land with standing water. Among the chief reasons why meadows which are annually flooded for weeks are so unprofitable may be reckoned the killing off of the whole living stock of earth-worms. Doubtless their eggs remain in the ground and renew the race; but in such meadows earth-worms are always few, which prevents the aeration and movement of the soil.

The after effects of floods, which are often so injurious to human health that it is believed that some of the greatest epidemics of the Middle Ages originated in the flooding of the Yangtse Valley, sometimes caused similar outbreaks among animals.

Early in the last century the head-waters of the great river Apure, a tributary of the Orinoco, burst down in flood from the forest regions where the waters generally lay in soak among the marshes, and let loose the vegetable detritus which had been accu-

mulating there for ages. This flood-borne vegetable matter, carried down the stream through what were usually some of the healthiest plains of South America from the great primeval forest of San Carmilo, brought with it a plague which attacked all the higher forms of animal life from reptiles to man. It was the modern equivalent of that corruption of the Nile water which preceded the plagues of Egypt. Don Ramon Paez states that "the first symptoms of the epidemic appeared among the crocodiles, whose hideous carcasses might then be seen floating down the stream in such prodigious numbers that both the waters and the air of that fine region were tainted with the effluvium." The symptoms of a crocodile epidemic are then described, probably for the first time. "It was observed that they were first seized by a violent fit of coughing, followed by a vomit, which obliged them to quit their watery homes, and finally to find a grave among the thickets on the river-banks. The disease next attacked the fish and other inhabitants of the water with equal violence, until it was feared that the streams would be depopulated. The fearful mortality among them can be estimated from the fact that for more than a month the rippling waters of that noble river, the Apure, were constantly washing down masses of putrefaction, its surface being almost hidden from view for many weeks. The next victims were the pachydermata of the swamps. It was a piteous sight to see the capybaras and the grizzly wild swine dragging their paralysed hind-quarters after them: hence the name of 'derren-

gadera' applied to this disease. Not even monkeys, in their aerial retreats, escaped the contagion. Their melancholy cries resounded through the woods."

This flood-engendered pestilence then attacked the horses of the llanos, and lastly the people, who for some time abandoned horse-breeding. On the other hand, great catastrophes in animal life, attributed to floods by those who discover the remains of the victims in later periods, may often have been due to a different, or even exactly contrary, cause.

Thus Charles Darwin noted that in the great drought which afflicted South America from 1827 till 1830, when the deer used to come into the court-yards to drink at the wells, and one proprietor lost every head of a herd of twenty thousand cattle, the latter animals in herds of thousands rushed into the Parana, and then, being exhausted by hunger, were unable to climb up the muddy banks, and so were drowned. A very rainy season followed this drought, and caused great floods. "Hence it is almost certain that some thousands of the skeletons were buried by the deposits next year. What would be the opinion of a geologist, viewing such a collection of bones, of all kinds of animals, and of all ages, thus embedded in one earthy mass? Would he not attribute it to a flood having swept over the land, rather than to the common order of things?"

CHAPTER IX

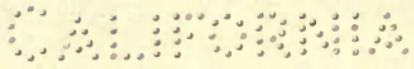
THE MIGRATIONS OF INSECTS

NOT long ago a story was current which sounded like the realisation of a collector's dream. A ship was crossing the Atlantic from the United States, and was followed by a number of butterflies of a large species called the "black-veined brown." The butterflies kept up with the ship, probably alighting on it at night, and when the steamer drew near the Scilly Islands were still following it. Shortly afterwards thirteen of these American butterflies were said to have been caught in Cornwall, it was alleged by friends of an entomologist on board, who contrived to let them know by the earliest possible means that such distinguished strangers might be expected.

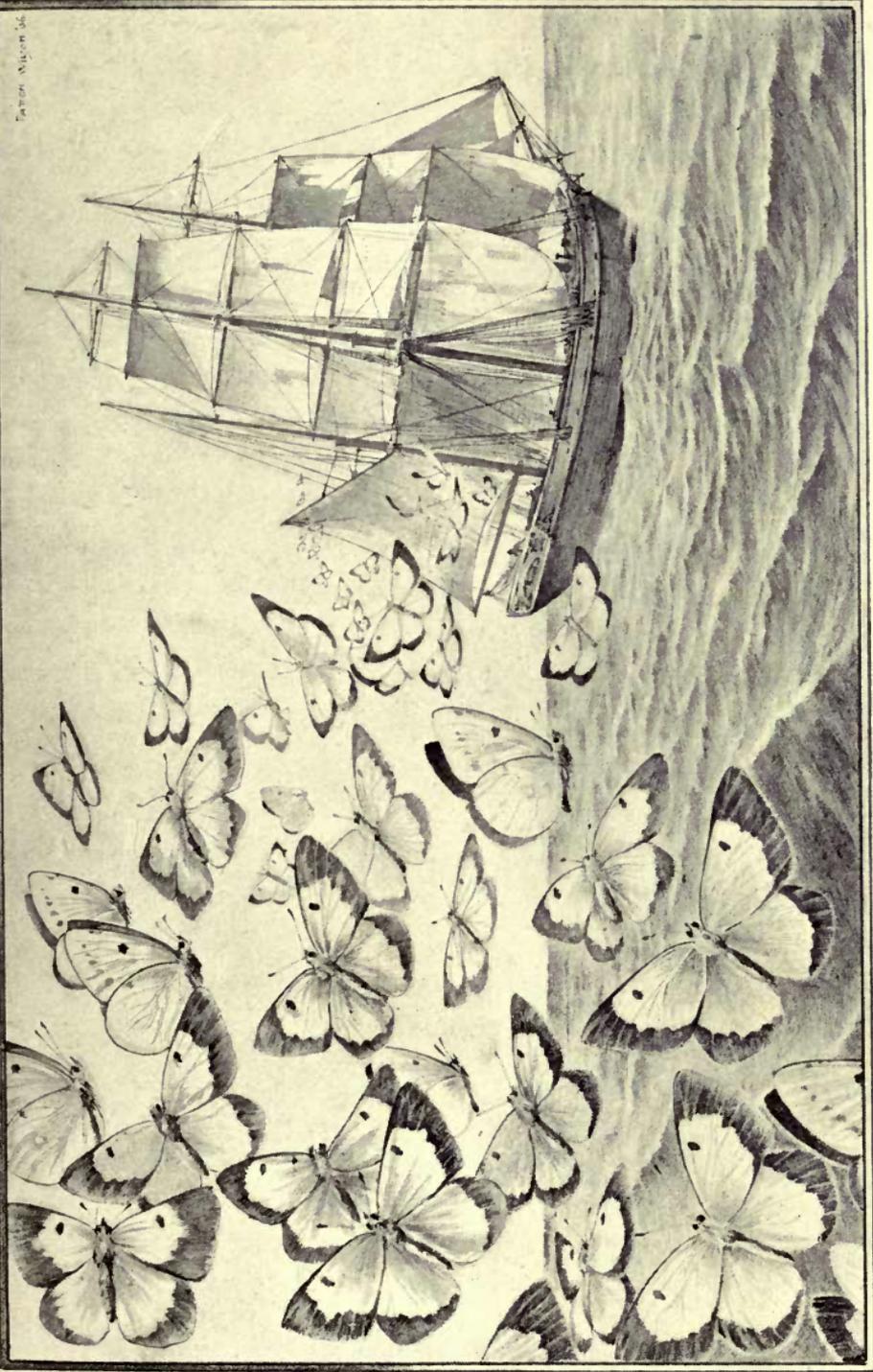
Whether the story is based on fact the writer knows not. But there is good reason to think that butterflies do occasionally cross the sea, whether by choice or compulsion, and that they are not the only insects that do so. Others also travel great distances by land, or migrate to pastures new on ships, in trains, and among the feathers of birds. The unusual numbers of the Camberwell beauty butterfly seen a few years ago on the South Coast were believed to have been blown across, or to have flown across with a fair

wind, from France, whence also passengers on the Calais-Dover boats saw not long ago swarms of common white butterflies crossing the Channel. This is not in the least surprising. The large vanessas, such as the red admiral or Camberwell beauty, fly swiftly and strongly. One came out to a Scotch boat going up Channel, and accompanied it all the way to the Clyde. When Darwin was off the mouth of the Plata, and also off the Patagonian shore, the ship was often surrounded by insects. "One evening," he writes, "when we were ten miles from the Bay of St. Blas, vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range. More species than one were present, but the main number were very similar to the common English *Colias edusa*. Even by the aid of a telescope it was not possible to see a space free from butterflies. Some seamen cried out 'it was snowing butterflies.'"

There seems to be an occasional migration of insects into this country across the North Sea. Very few people who have lived on the coast of Norfolk or Suffolk doubt it. From time to time ladybirds and other insects are found washed up by the waves, or floating near the shore, in numbers "like dust for multitude." It is possible that they were blown off-shore first, and then washed up again by a change of wind. But it does not seem probable that they would be in such compact masses if dispersed and struggling against an adverse gale at some distance from land. On the other hand, it is well known that birds sometimes fall into the sea from exhaustion when



Tarion Wilson '86



BUTTERFLIES FOLLOWING A SHIP AT SEA.

crossing *towards* land, and the case of these ladybirds seems much the same. Sometimes the drowned invaders consist of black flocks of the tiny turnip beetles, which lie on the waves like soot. Fishermen who spend much of their time off the mouth of the Wash and the north Norfolk coast have told the writer that butterflies constantly visit their boats, flying *in from the sea*; and from time to time blue butterflies are seen lying at short intervals, from yard to yard, along miles of the sea-fringe of sand on the Lincoln coast.

The painted lady butterflies appear to assemble for migration as swallows do. Great columns of them many yards wide have been seen flying in a given direction.

A locust alighted on the deck of the *Beagle* at a distance of three hundred and seventy miles from land. If an insect only four inches long can make such a flight, no limits can be set to the possible migrations of locusts. They cross seas and even mountains. Some years ago they appeared near Darjeeling. Whence they came is not precisely known. But it is believed that they crossed the Himalayas from Thibet. The invasions of locusts are best remembered when for some reason unknown they decide to leave the regions over which their flight is generally taken, and to make a vast aerial trek into others. Such invasions naturally attract great attention. The records remain, emphasised by the actual losses inflicted, and not infrequently by more serious misfortunes.

It will be remembered that the plague of locusts recorded in the Book of Exodus was almost immediately followed by the death of the first-born, and in the Middle Ages a locust invasion of the North or West was regarded as one of the regular precursors of great pestilences.

In 1528 there appeared in the Mark of Brandenburg, during the prevalence of a south-east wind and a great drought, swarms of locusts, "as if this prognostic too of great epidemics was not to be wanting," says Hecker. This "prognostic" had been observed before the Black Death in the fourteenth century, the beginning of the "morbific conditions" in the Far East having been innumerable locust swarms, which destroyed the crops in Hunan, and caused the famine which pestilence followed.

Locusts appeared in Franconia in incredible swarms in 1337, and the celebrated "stinking mists" which spread over Italy at the time of the Plague in 1348 were made worse by the odour of putrefying locusts, "which had spread from the East to the West." The locusts were regarded as having been summoned by celestial wrath to complete the destruction of mankind which earthquake, famine, and pestilence had begun. In 1542 swarms of locusts migrated from the interior of Asia, and travelled across Europe as far north as the Elbe, and as far south as Spain. The Turks were then invading Hungary, and by a natural coincidence brought the plague with them.

Induced migration of insects offers some curious points in political natural history. At the beginning

of the last century the possibility of introducing the cochineal insect was much discussed in India. Red dye was expensive and scarce; but red was a colour highly prized, and for which there was a great demand. Clearly, if the cochineal could be introduced there would be a sale to a vast local population. The cultivation of the cactus on which it fed, and of the insects themselves, which are planted out in little communities on each young cactus-plant, seemed exactly suited for the laborious Hindoos. To add to the wealth of the many nations and languages of the peninsula by the induced migration of one hardy plant and a little red blight seemed almost a natural miracle, yet a possible one. Yet for some reason, though the economic arguments were all sound, the cochineal insect refused to migrate with a cheerful mind.

It flourished when taken from its native Mexico to the Canary Islands, that Western foster-mother of other tropical products, and to some degree in Java and Algiers. But the parts of India to which it was taken did not suit it.

On the other hand, an equally insignificant insect has crossed the Atlantic, and not only the Atlantic but the New World itself, and been settled on the Pacific coast by the aid and desire of the Californian fruit-growers. The story of its journey and establishment is like an echo of some anecdote by Herodotus of Greek rites rationalised by reference to some Egyptian "mystery." The ancients had an immemorial custom of hanging up branches of a wild fig, which they called the goat fig (just

as we speak of the "dog" rose), on the edible fig-trees at certain seasons, in the belief that the wild fig fertilised the other. In this they were perfectly right, but it was not done in the way in which they thought. Though the wild fig has male and female flowers, the former do not directly fertilise those of the edible fig. That is done by an insect hatched in the female blossom of the wild tree. These blossoms turn into galls, the galls in turn liberate a fly, the fly visits and is covered with the pollen of the wild fig, and then flies into the female flower of the other and fertilises it. In order that the edible figs introduced into California from Asia Minor might be properly fertilised, these insects were introduced, it having been found that without them the trees did not give a proper yield.

A curious instance of insect migration in which the creature seems to have travelled in order either to "better itself" or because it is naturally of an adventurous turn, was given some years ago in a pamphlet written by a Russian diplomatist, who in the intervals of political work applied himself to the task of unravelling the ancient and widespread belief that bees are born from the bodies of dead oxen. It is a belief of remote antiquity, which appears in many languages. The author identified the insect which gave rise to it as a fly called *Erystalis tenax*, which, in addition to being very like a bee, has the power of feeding on and breeding in a very great number of substances, nice or nasty. Incidentally he quoted evidence as to the curious migrations of the fly, which has in recent

years accompanied ships into most quarters of the globe, and become a colonist, like the brown rat or the cockroach. The large Oriental cockroach is now firmly established in this country. In return for this doubtful blessing we have sent to New Zealand the humble-bee to fertilise the antipodean clover, and are, it is said, about to export ladybirds to eat the blight on the vines of Australia.

CHAPTER X

ANIMALS AND POISON

IN the account of Colonel Mahon's successful expedition against the latest Mahdi, in 1903, it was noted that on the march back to the Nile a number of the horses died from eating "poisoned grass," on which they browsed at the halting-places. A similar instance of the failure of instinct to detect danger lurking in vegetable growth, as regards which it might naturally be concluded that the animals' senses would, after long experience in the life of a species, have inherited caution, occurred quite recently in Somaliland. A train of Indian camels were brought over for use in the army transport, many of them being exceptionally good and strong animals. There were also many native Somali camels at the base. The Indian and Somali beasts were both allowed to browse freely on the wild shrubs round their quarters. The camels which had been born of native stock took no harm. But the Indian camels ate shrubs which were so poisonous that many of them died. It is not stated that they over ate themselves, which rather stupid creatures like camels will often do when they get the chance, but that they were actually poisoned by the toxic qualities of the food which they selected.

It is an interesting question whether the native Somali camels really avoided the dangerous plants, or whether they had become "immune" by eating them for generations, as cats and their kittens which have eaten snake poison are believed to become protected from the effects of a snake bite. But the probability is all in favour of the theory that they purposely avoid and reject what they instinctively know to be poisonous. If the food is pleasant and plentiful, there is no reason to believe that animals ever cease eating until they think they have had enough, and by that time it would probably be too late for them to make use of experience on a later occasion.

Whatever be the reason for the fact, "warning" notices of various kinds are frequently affixed by Nature to poisonous plants, almost as legibly as the label which the law insists that chemists shall place upon poisonous drugs. Many of the poisonous fungi have an odious smell, so much so that no mammal or bird ever thinks of touching them. On the other hand, the scent of the mushroom is distinctly appetising and pleasant. Henbane, an exceptionally poisonous and quite beautiful wild plant, has a most unpleasant scent which is instantly detected by cattle when the plant is green. They most carefully avoid touching it when growing. But it seems to lose its warning odour when dried in hay. Instances have been quoted in which it has been injurious to cattle when consumed in this form. The common "fool's parsley," which has poisonous seeds, is not, we believe, eaten by any bird; neither do cattle touch it when growing in

meadows. But they sometimes seem to have no such suspicion about the water hemlock, which is so peculiarly deadly to both cows and horses. Mr. Rider Haggard in his "Farmer's Year" describes the sudden death of a colt, just turned out with its mother in the early spring into the wet meadows by the river Waveney, from some such plant eaten in the grass.

One of our most poisonous native plants is the ordinary foxglove, from which "digitalis" is made. Every part of it is toxic in a high degree—flowers, stem, leaves, and roots. It has no unpleasant odour of any kind, but for some reason cattle never touch it. The lower leaves are among the earliest to appear on the banks or on commons, though the tall spike appears much later. But however scanty the herbage, these leaves are left uneaten, although in appearance they very closely resemble prickly comfrey, which is grown as a forage plant in some parts of the country.

In the hemlocks, several of which are poisonous to man or beast, the dangerous ingredient varies. In the spotted hemlock it is "conine," which is present in great quantities in the seeds, though there is very little in the leaves and stem. The Greek poison was probably prepared from these seeds, as is the medical extract made at the present time. On the other hand, in the water hemlock, which is not very common in England, though found abundantly by Scotch rivers and on wet grounds in the North, the poisonous principle is contained in an essential oil. Spotted hemlock kills or injures human beings by causing paralysis, which progresses through

the nervous centres till it attacks the lungs. In the water hemlock the poison acts in a different way. Like another and more deadly vegetable poison, strychnine, it causes tetanic spasms. The difference in the nature of the poison contained in plants so closely alike as these two hemlocks may perhaps account for the failure of cattle to know the danger to which they are exposed in eating them. It may well be that one variety, though injurious to man, may not affect cattle. Consequently they might naturally eat without any misgiving the other variety which is deadly to them.

The sense by which animals detect the presence of a poison is mainly that of smell. They seem to have very little sense of taste upon the palate. But carnivorous animals have a kind of "half-way" sense between taste and stomach-ache which very soon tells them when they have taken poison or anything likely to disagree with them, and Nature has kindly arranged that they can get rid of it by the throat with very great ease. An extraordinary instance of this was recently quoted in the *Country Gentleman*. A Scotch keeper had a retriever which he had taught to fetch any object that he had left behind him. One day on the moors in the spring he found that he had left his knife at a place where he had been sitting no great way down the hill, and sent the dog to fetch it. The dog galloped back to the place, and finding the knife, concluded that that was what he was to fetch, and picked it up. So much at least seems certain from the sequel, for when the

dog arrived he had not got the knife, and also looked somewhat shamefaced. The keeper tried to send him back again, but he would not go. He went back himself, taking the dog with him. No knife was there; and it was certain that had it been dropped the dog would have picked it up. It then flashed across his mind that the dog, in running up the hill with the knife in his mouth, had swallowed it. Unfortunately, as it apparently was not uncomfortable, the retriever showed no signs of wishing to do other than digest it, which, as it was a valuable dog, the keeper was most unwilling to risk. So he took a handful of salt, clapped it into the dog's mouth, and held it tight for a minute—and after one or two coughs the knife made its appearance. The dog was, of course, trying to get rid of the salt, not of the knife.

Wolves, tigers, leopards, and most other carnivora are difficult to poison, from the similar power which they have of rapidly getting rid of a drug. Lions, on the other hand, are very frequently poisoned. It is said that a good many lion-skins, especially those sent from Somaliland before the regrettable misunderstandings between whites and blacks had begun in that region famous for large game, were obtained by the unsportsmanlike method of poisoning carcasses and leaving them for the lions to devour. Cattle, which have no less than four stomachs, are hopelessly poisoned if once they have swallowed a fatal dose, whether in a toxic plant or otherwise. But this curious arrangement of their interiors enables them to take very large doses of certain poisons without any ill effects,

as a drug becomes so much diluted before it reaches the last or true digestive stomach. Half an ounce of black shag tobacco is often given to cattle as a vermifuge, and though in such a case the animal's temperature falls slightly, and its pulse is rather slow for a few hours, it feeds as usual and appears to feel no inconvenience.

In common with human beings, animals seem to be affected by poison in certain forms when in a particular condition of health. At other times they can eat the same plant or shrub with impunity. In certain states of health a man can eat pork, lobsters, cockles, scallops, and other somewhat risky foods without bad effects. At other times the same edibles would produce on him the effect of slight ptomaine poisoning. Two persons may eat of the same food at the same time, and while one is perfectly well afterwards, the other may become violently ill. The curious cases of yew poisoning among cattle or horses seem to be somewhat analogous. They will sometimes browse on shoots of yew and take no harm whatever. At other times they are obviously made very ill, or die, from eating the leaves. They have even been found dead with the yew fresh and undigested in their stomachs. Where poisonous plants are present in any great numbers in herbage, it seems quite impossible to prevent cattle from eating them. The "poison veldt" of parts of the Transvaal has a particularly bad reputation caused by plants—one of which is said to be a species of tulip—which come into leaf in the spring.

In addition to the poisons mentioned above, the

deaths or illness of English cattle have been traced to eating the leaves of laurel, common crowfoot, and various other plants of the ranunculus family, wild parsnips, and acorns, which are very astringent; and also, it is believed, to their eating woody nightshade. The old custom of keeping a goat with cattle was based on the idea that the strong smell of the goat acted as a natural disinfectant, and so prevented certain obscure diseases to which they are subject; but there is reason to believe that the goat is beneficial because it eats by choice and with impunity plants which are very injurious to cows.

CHAPTER XI

WILD SWANS

THE flight of birds still gives true auguries both of storm and sunshine. They alone can almost outstrip the wind ; and if they cannot outfly the onward march of frost, they can soon place hundreds of miles between themselves and any region suddenly invaded by intolerable cold. One of the surest indications that the Ice King has enlarged the borders of his dominions, and brought the seas and shores lying southward of the Arctic night temporarily under his sway, is the arrival on our coasts of the swans, the birds which Norse legend and fancy identified with the snow-clouds and the realms of everlasting ice. The author of the *Religio Medici* says in his notes on the birds of Norfolk: "In hard winters elks, a kind of wild swan, are seen in no small numbers. . . . If the winter be mild, they come no further southward than Scotland ; if very hard, they go lower, and seek more Southern places, which is the cause that sometimes we see them not before Christmas or the hardest time in winter." Mr. Stevenson, the author of the "Birds of Norfolk," the classic of local ornithology, says that this account written by the learned Norwich physician in the days

of Queen Elizabeth agrees most accurately with modern experience of the visits of the wild swan, since, with one exception, he had no trustworthy record of their being killed in the county before December, and then only when there was an early beginning of frost and snow. All the very severe winters are noted as "great swan years" in Norfolk, and the birds then often stay till as late as March. By that time they are scattered in small flocks round the coast and salt-marshes. But in the first week in March they gather into "herds" and fly straight northwards, passing right across the county in a straight line for that part of the Arctic Circle in which they intend to nest.

There is something particularly interesting and suggestive both in the appearance and the life of these grave and stately strangers from the hyperborean lands. They are the largest of all the Northern birds, and infinitely the most striking in form and hue. They are among the very few birds of pure white plumage in summer and winter alike. They are absolutely harmless, though possessed of great strength and power of flight; and they depend for their existence on the fact that they make their nest and rear their young in lands where no man dwells, or where those relentless enemies of animal life, the savage and the semi-savage, are so rarely found that these great, helpless, ground-nesting birds are in a measure free from their molestation.

It is said that the hooper swans once nested in the Orkneys. But at the present time these, the commonest

of our wild swan visitors, breed in the farthest North, in Iceland, in Lapland, and on the enormous fringe of tundra which runs along the rim of the Old World from the White Sea eastwards. When the late Mr. Seebohm and Mr. Harvie-Brown were waiting together on the Petchora River to see and mark the arrival of the birds from the South to nest in the Arctic tundras, almost the first birds to come were the wild swans. These would not be the birds from Norfolk, but possibly those which had spent the winter on the Caspian Sea. In the spring each pair flies some thousand miles north, probably to nest on or near the spot where its ancestors reared their cygnets centuries ago. In the valley of the Yenisei, where Mr. Seebohm saw them when he accompanied Captain Wiggins on one of his bold adventures through the Kara Sea, the hoopers appeared on 5th May. On the Petchora they arrived in pairs on 11th May, flying high overhead, and soon settled down in the willow scrub which covered the islands, and there built their great nests of sedge and reared their young.

Besides the hooper, we are visited in hard winters by a smaller wild species, which the old naturalist Pallas identified a century ago. It is known as Bewick's swan, and though smaller than the hooper, comes from even more distant lands. Like certain other species, this bird vanishes from all human knowledge in the spring, as if it had become transformed into the snow-clouds with which Northern fancy identified its race. It is now known to nest on lands so profoundly remote that the previous

uncertainty as to its origin is easily accounted for. It breeds in the tundras west of the White Sea, lands absolutely unvisited by ordinary travellers, and inhabited only by scattered Samoyeds, whose interest in natural history is confined to trapping the birds upon their nests and stealing their eggs, or to organising swan drives when the unfortunate birds have shed their flight feathers and are helpless. The numbers of men and of swans and wild geese in these distant Arctic lands vary inversely. Swans and geese, unlike nearly all other birds, shed most of their flight feathers at the same time, and remain unable to fly till the fresh quills have grown. At such times the "native," if unfortunately he happens to be in the neighbourhood, takes the opportunity to kill the birds.

The Bewick's swans, though reared at such a vast distance in the farthest North and East, come in numbers to the shores of Ireland, where the numerous estuaries and bays offer them a safe and congenial winter home. It is among the curiosities of natural history that while these two birds fly north to nest in such high latitudes, the wild mute swans, the originals of our domesticated birds, nest at least a thousand miles farther south, and never visit our shores. They do not breed west of the Rhine, or farther north than Denmark and the south of Sweden.

The flight of these, which are probably the largest of all swans, is a most beautiful sight; but owing to the foolish and cruel custom of pinioning all swans on the Thames, it is not so often enjoyed as it might be. There are now so many swans on



“THEY FLY IN ORDERED RANKS, AND EACH STROKE OF THE WINGS MAKES A CLEAR AND MUSICAL SOUND.”

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the lower reaches of the river that in severe winters they are half starved; but as they cannot fly, it is impossible for the poor birds to move away in search of food, and they often get pinched and hurt by the moving ice. Apart from the cruelty to the birds of depriving them of their power of flight, the loss to the river scenery can only be realised by those who have lived near a colony of half-wild swans and seen them constantly in flight. The birds fly in ordered ranks, if in any number, and each stroke of the wings makes a clear and musical sound. The stretch of the pinions is often as much as eight and a half feet across, and though its flight is not apparently fast, the progress of the bird is very rapid. This may be seen almost any day on some of the south coast estuaries, and a flight of swans out over the bay is a sight not to be forgotten. Their great size and snowy plumage keep them in sight longer than any other birds could possibly be visible to the eye. Their flight looks like the beginning of a journey into infinity, and Tennyson's description of a rock-built palace that—

“Lent broad view to distant lands,
Far as the wild swan wings, to where the sky
Dips down to sea and sands,”

is admirably appropriate.

Whence the legend of the swan song came is not very certain. It was one of the tales of the ancients; but, unlike most other fables concerning birds and beasts, was very early questioned. Even Pliny, in his great reservoir of nonsense about animals, doubted it;

and so did Athenæus and others. Sir Thomas Browne noted it among his "vulgar errors." But the call of the hooper swan as it flies is very striking, and when uttered by night may well have given rise to the story.

The mute swan, now seen either tame or half wild all over England, is believed to have been first brought from Cyprus by Richard Cœur-de-Lion. Consequently, as the visits of the wild Arctic swans were mainly confined to the coast, there was little material in England for the growth of idealisation such as the beauty, dignity, and whiteness of the birds suggest. The early swan legends are all of Northern origin. Norse story made them the sacred birds of the goddess Freyr, and identified them with the form and colour of her chariot in the clouds. The whiteness and purity of the bird's colour naturally gave rise to the myth of the swan maidens, too good for any one in this world, and able at will to transform their shape and take wing to the virginal snows. Lohengrin's mysterious arrival and departure in the boat drawn by a swan may naturally be traced to the riddle of the silent and sudden coming and going of the migrating swans, "coming no man knoweth whence, and going no man knoweth whither." In the legend of Helias all the other six brothers and sisters were changed into swans—in other words, were given the power of safety and flight at will—while the known confidence of the birds in man (in the South, where they were early half domesticated) typified their willingness to return to human shape.

It is perhaps not generally known that Edward I. of England took the swan for his badge or totem. When his son the Prince of Wales was knighted, and then conferred the Order on three hundred of his companions of noble birth, two swans are said to have been brought into the hall "gorgeously caparisoned, and with their beaks gilded, a most pleasing sight to all beholders," and upon these swans the King swore before all his Court to avenge the death of Comyn, whom Robert Bruce had stabbed in the church where he had appointed a meeting to settle their claims to the Scotch throne.

CHAPTER XII

TAME CYGNETS

WHEN swans were more highly thought of as property than they are now, a swan-owner brought an action against another swan-owner to assert his rights to halve the cygnets of a brood. He proved by the swan-marks that though one parent belonged to the rival claimant, the other belonged to him, and suggested a division. The case was taken before Lord Chief Justice Coke, who based his decision on the high moral and domestic character of swans, evidence of which was adduced to his complete satisfaction. "The swan," he said, "is the husband of one wife, and remains so until death. Consequently, the children are of undeniable parentage." As the two parents belonged in this case to different owners, he decided, with a wisdom that Solomon could not have excelled, that the offspring of swans sprung from these mixed marriages should be divided, the odd cygnet, if there was one, going to the owner of the hen swan.

The reputation for conjugal constancy so set up, and with some justice, for the swans does not, it is to be feared, extend to them in their relation as parents, which leaves very much to be desired. They show, in fact, an odd mixture of instinctive sense and in-

credible stupidity about their nesting and nursery arrangements. When one sees a hen swan reaching out her neck as she sits on her eggs, and steadily building up her nest, while heavy rain threatens and there is a chance of a flood, it suggests sense and foresight. Yet the same swan will never think of picking up her cygnets and replacing them in the nest if they fall out into the wet grass, and lie there dying of cold, while she stolidly tries to hatch off an addled egg. And an old cock swan will often kill every one of his children in the autumn if they are left on the same isolated piece of water with him.

The curious limitation of swan character and brains does not so seriously affect their offspring when the nest is built on the flat banks of a shallow lake or on a tideless stream. There the cygnets can almost take care of themselves; but if they get into any sort of dilemma, the old birds seem to have no idea of helping them out of it.

The two swans which make Chiswick Eyot their headquarters, and are the pair which nest lower down the Thames, *i.e.* nearer to the City of London, than any other, have exceptional difficulties to contend with. The tide falls some fifteen feet, and at low water, if they have a brood, and insist on taking the little birds up on to the eyot, they have to scramble up a very high and steep bank, with weltering pools of mud below. For several years these birds built a nest and sat with a patience that deserved success, and yet the eggs were always stolen or addled. Then four cygnets were hatched, but only survived a day, for

they got out of the nest while the hen swan calmly sat on, and, though replaced twice by kind friends who got very wet and muddy in doing so, they fell out again before night, and as neither swan thought of picking them up, they were all dead next morning. Next year the swans refused to use a good high nest made for them, which would have raised their eggs out of reach of the spring-tides, and kept to one of their own. The result was that the bird was twice floated off her nest and all the eggs but one spoiled. Strange to say, this egg hatched, and for a whole day it was just possible to hear the little piping voice of the cygnet, which the bird kept under her. Next day she left the nest at high water and took the little bird for a swim. When a cygnet is tired its instinct is to climb on to the old swan's back, but the stupid swan did not give it a "leg up" (swans do this by putting out their broad webbed foot, on to which the cygnets first scramble), but kept giving the cygnet her "wash." She soon returned to the island, and as the tide was still high, the infant managed to scramble up after her and into the nest.

Next day the swan brought the cygnet down to the river at half ebb, and kept it there until the channel below was dry, and the steep bank, about twenty times as high as the cygnet, had to be climbed. The little creature scrambled up part of the way, and then rolled down and fell on its back in the mud. Now, little swans are built like a flat-iron or a Dutch barge, and when once on their backs can no more get up than can a fat sheep, a fact which we discovered soon after we

began to rear this one. It was quite helpless when on its back even when two months old, and could only lie and kick. The old swans looked on to see how long it would go on kicking, but otherwise took no interest in the proceedings, even when the cygnet was rescued, nearly suffocated, from the mud. All they did after it was restored to them was to take it up the slope and let it roll down again. So the baby was once more rescued, and after this had happened three times it was taken indoors, washed clean, dried, and put to bed with a hot-water bottle. When it awoke it was quite dry and warm, with a coat like grey plush, and a good appetite. Unfortunately, though it called out loudly for food, it would not eat a morsel of anything which was given to it. One might as well have offered a baby an omelette or a mutton-chop as try to induce the cygnet to feed except in its own particular way.

What this way is, is rather interesting. If an old hen swan with her newly hatched brood is watched, it will be noticed that she pulls up water-weeds from below the surface and strews them on the water, making a kind of call to the cygnets. It has been said that the swan is "feeding its young on water-weeds." She is doing nothing of the kind. She is giving them these weeds in order that they may suck off them the slime, and eggs of the *entomostraca* and other invisible creatures in the water. Also, there is often a number of the eggs of fish on these weeds, with the larvæ of snails and other molluscs and insects. All this, a kind of natural river soup or "frame food," forms the pap on which an infant swan is brought up, and it won't

be happy till it gets it. In addition, it will only get it in its own peculiar way, which is by "bibbling," to use the words of the Norfolk gunners. It takes the weed in its beak and sucks and works it between its mandibles, just as ducks "bibble" in the muddy margin of a ditch.

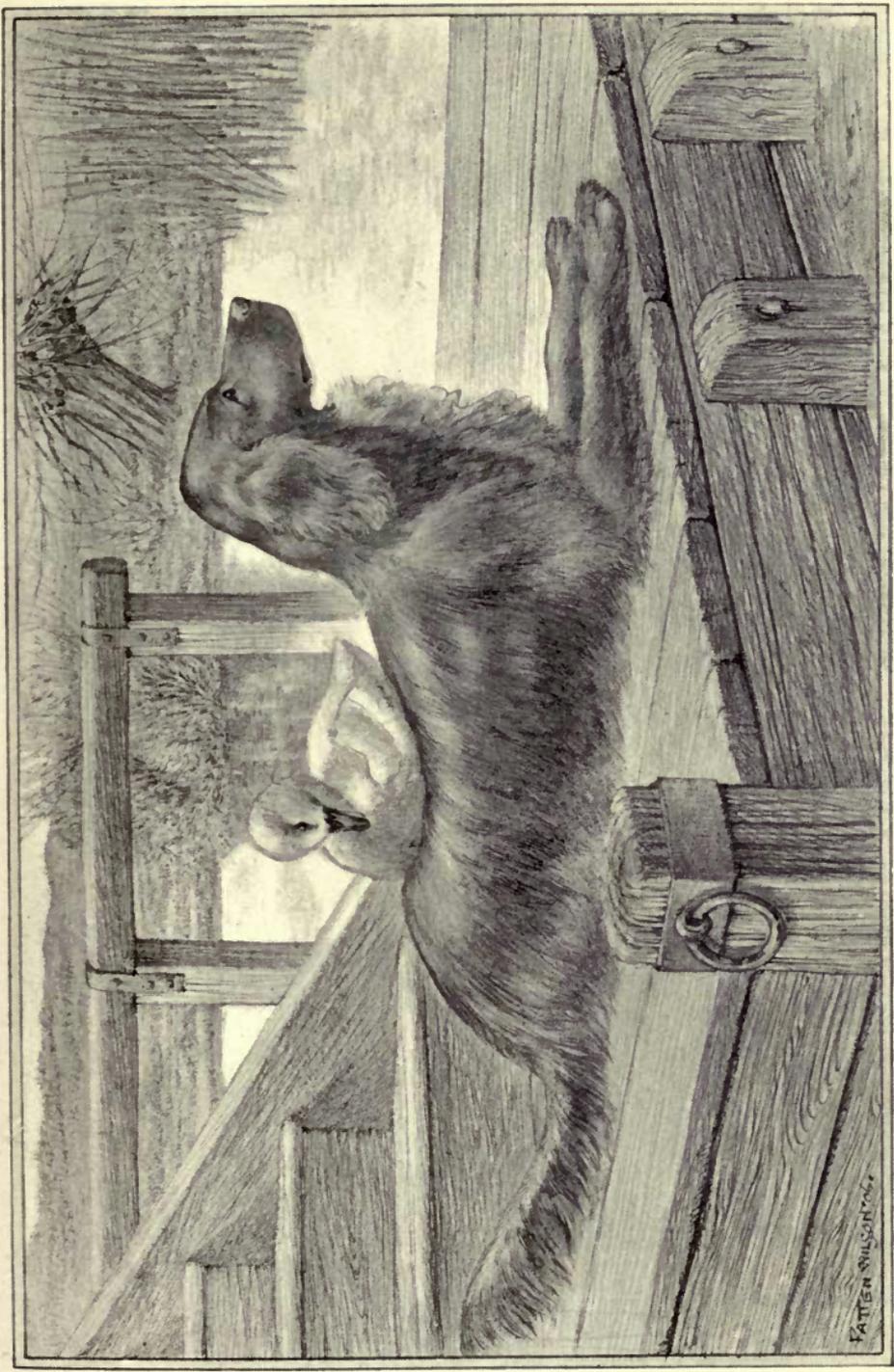
To improvise the eggs of *entomostraca* and put them on water-weeds is simply an impossibility, and though we gave our cygnet the tips of rose-bushes covered with green blight, which it at once washed and "bibbled" and sucked so long as any blight was left, this was a poor and scanty substitute. So it had to be fed, *i.e.* crammed, with a weak mixture of Gilbertson and Page's duck-meal, specially made for young wild-ducks, and muddy Thames water. As it threw away every scrap which it could, and as far as it could, this was a messy and troublesome process. The lady who fed it had to wear an apron up to her chin. Also, as the little swan was intensely distressed if it got any meal on its fluff, and made desperate efforts to clean itself, instead of even trying to swallow the food, it had to have a bib too, to keep it clean and not too miserable. As it would take very little food at a time, and woke up complaining bitterly at all times of the night, the first three days were rather critical, both for the cygnet and its mistress, who began to show signs of exhaustion about the same time as the little swan began to show equal evidence that it had "turned the corner" and was going to live to be an ornament to its country. As it sat out on the lawn with all the gravity of a swan

of twenty summers, we noticed that it put down its beak to taste the drops which had fallen after a shower. Hitherto it had resolutely refused to drink water, or to swallow anything, without compulsion. But when we saw it drink we promptly got a saucer, mixed a pinch of duck-meal with plenty of water, put it down before the cygnet, and dipped its beak in. It squeaked resentfully, but seemed to like it. Presently it sat down before the saucer and babbled away as if it had known how to do it all its life. From that hour there was no more trouble with it so far as food was concerned, or indeed in any other respect. It would take its saucer of duck-meal, mixed very weak, always sitting down to eat it; after which it would get up, shake its ridiculous little wings, and either walk off to its basket or sit down by the person who had fed it.

As probably very few people have had a cygnet under close observation, not only by day but by night, until it grew into a swan, perhaps the following notes of its habits may be new. When hatched it weighed about 6 oz. It did not begin to grow for a week, and then gained about 4 oz. per week. Until it weighed 6 lb. its wing-bones were quite rudimentary, like those of a penguin. The cygnet's plumage consisted entirely of soft grey down, and the first signs of feathers appeared round its eyes. It carefully oiled and brushed itself several times a day, using not only its beak but the back of its head as a brush, and rubbing every part of its body over with this, especially the flanks. If it were too wet

to get dry quickly, it was pleased to be dried with a towel. It liked to swim in the bath, but shrieked if it could not see over the top. This leads up to a very interesting instinct in the young swan. The great danger of its life is being unable to get out of the water when tired. This was the danger which had nearly killed it when we saved it. A deeply seated instinct prompts the little creature to climb up any obstacle. It climbs on to its mother's back, and climbs up the banks of rivers or ponds. To aid it to do this it has quite sharp claws. But it is never happy till it has clambered to the top of anything on which it happens to be. If taken on a lady's lap it would generally try to climb up higher, and would be quite contented when it got on to her shoulder. In the same way it was quite ready to climb on to the back of the setter which was its companion for a time.

Its last meal was supper, at 11 P.M., which it always ate by lamplight on a balcony. It was then quite ready to go to sleep in a basket of hay, with the lid shut down, in which it would talk itself to sleep. For one of the most curious points in this little swan's behaviour was that, unlike the grown-ups, which are known by the scientific name of "mute swan," it was very seldom quiet. It had all sorts and kinds of notes, from a most contented little pipe up to a doleful and complaining shriek, as, for instance, when it first saw a cat. The happier it was the more syllables it used, until when very contented and half asleep it almost twittered like a swallow. It did this when half awake,



"THE CYGNET WOULD CLIMB ON TO THE BACK OF A SETTER WHICH WAS ITS COMPANION."

too, or if a candle was lighted at night when it was sleeping.

It was quite obvious that its parents would kill it by leading it up the steep bank which it could not climb if it were given back to them. But when it was shown to them safe and sound on the bank they seemed so anxious to have it back that another larger cygnet was fetched up from Brading Harbour in the Isle of Wight, and after being kept with the little one for a day to rest after its journey, was handed over to the old swans. At first they made a great fuss over it, adopted it, and swam about in a family way; but within half-an-hour afterwards the cock swan attacked it and tried to drown it, running it down as a big ship might a little one. So that bird also had to be rescued, and for a day or two was kept with the baby swan, which was about one-fifth of its size. It was ridiculous to see the way in which the civilised infant patronised it, showed it how to eat duck-meal out of a soup-plate, and pecked it when it was not wanted. Then the bigger cygnet was sent back to its father and mother and four brothers and sisters in the Isle of Wight, and for a week all went well. But a few days later the father swan, tired perhaps of its stories of London life, attacked the unfortunate cygnet; which, after living alone for some days up a ditch, was again rescued and taken back to live as the humble follower and admirer of its friend the foundling cygnet, in the most happy circumstances, with a garden and pool all to themselves.

CHAPTER XIII

THIRSTY BIRDS

AT the end of a recent summer drought, after weeks of burning sunshine and dusty haze, the atmosphere underwent such a change, prophetic of rain, that the windows of Windsor Castle could be counted from the Great Western line near Slough. Then the thirsty birds also began to show signs that rain was at hand. They twittered and sang while the clouds gathered, and when after a night of continuous downpour the tempest ceased, they crowded to the pools and puddles, or to the lakelets left in the depressions of lead roofs, and there drank and bathed and splashed the water over their heads and backs as if they never could have enough of it. It is a sad "come-down" for a respectable family blackbird which has lived in the same garden for years to have to wash in the overflow of the garden hose, as he had been doing lately, while in places where no such appliances are found the birds had been suffering from a water famine of a very serious kind.

Possibly because their powers of flight enable even desert species to drink at least once daily, most birds do not seem to have acquired the power of going without water which several mammals possess. They gener-

ally drink at least three times a day in summer—in the morning about nine o'clock, again between half-past twelve and one, and again before they go to roost.

It might be thought that the birds of heaths and commons, such as whinchats, stonechats, wheatears, and the meadow pipit, which is often found on very waterless ground, do not drink often. But if the watering places near such heaths are watched, it will be seen that these birds fly considerable distances to visit them. Between the sea-marshes of Orford, on the Suffolk coast, and the fine old park of Campsea Ash, some miles inland, lies the wild and desolate tract of Tunstall Heath, over which the road passes. In a hollow close by the road is a pool, which only dries up entirely in very hot weather. To this pond there fly from the different parts of this dry and heathery tract birds of all kinds, especially the heath birds proper, as well as such species as yellow-hammers, linnets, chaffinches, and the small warblers. Each bird comes alone, flies down to the water, drinks repeatedly, and then wings its way back to its own particular haunt. When the pool dries up they still fly there for a few days to see if any water is left, and finding none, hang round the spot for some time, apparently at a loss where to go next.

In a long drought, and almost equally in a protracted frost, English birds suffer much from thirst. They may be seen sitting with their beaks wide open at such times, exhibiting every sign of discomfort, and possibly of suffering. Rooks and jackdaws are among the thirstiest, if we may judge from their behaviour. Jackdaws are ready to drink at almost any hour of the day,

and being clever and inquisitive birds, are highly ingenious at finding out where water is kept. Unfortunately, they are not equally thoughtful as to the means of reaching it, and both tame jackdaws and wild ones are constantly "found drowned" in sheep-tanks and garden water-carriers into which they have fallen in endeavouring to drink.

On the downs, whither most of the rooks from the lower ground move at the close of summer, they may be seen, together with the starlings, sitting in long lines in the evening, waiting to drink up what the sheep leave in the troughs. The scene at such times is often quite amusing. The shepherds are at the draw-well, three hundred feet deep, winding up the buckets. The sheep crowd densely round them in a solid mass, often jumping over each other's backs, or *on to* the packed flock, in the hope of wedging into a place. The starlings, eager to drink too, fly on to the sheep's backs and heads, and peer over into the troughs, while the rooks, equally thirsty but less bold, wait their turn for the "leavings" till the flock is driven off to be folded for the night.

For the ground birds, especially the young ones unable to fly, or only capable of moving by means of their wings for short distances, long droughts are a very serious matter. On many parts of the downs most of the ponds dry up, and all that the little partridges find to drink are the drops of dew in the morning. The result is a great mortality, which also occurs on waterless parts of moors among the young grouse. On many partridge manors tin troughs or

earthenware pans are set down in accessible places beside the fields, and the keeper drives a water-cart round to fill them daily. If one of these temporary drinking-places is watched, it will be found that the various broods in the neighbourhood visit it punctually every day at 12.30, each bird taking several sips at the water before it runs off again into the corn.

On the Lockinge Estate, both on the hills and also in the large meadows in the vale, a regular system of water-supply was constructed by the late Lord Wantage for the use of the cattle on these extensive pastures. There were large reservoirs, supplied partly by wind-mill pumps on the hills, and from these the water was carried to circular stone tanks, like a well-head ten feet across, which were so supplied as to be usually almost brimful. Both these and the reservoirs were ideal drinking-places for the birds. The wood-pigeons flew from all parts of the downs to drink at the sloping sides of the reservoirs (which were carefully railed and netted round at some distance from the water, to prevent sheep or hares and rabbits from getting in and being drowned); while smaller birds, and also partridges, used the tanks when full. One of these was regarded by a covey of very tame partridges as their especial property. They used to dust and sun themselves on one side of the tank, and go round to the other to lie in the shade at midday. When thirsty the whole covey would fly up on to the rim of the tank, and, bending down, would alternately sip the water, and then raise their heads to "say grace," in a very pretty and amusing way.

As with human beings, so with birds it is easy to reach the water-side, but not always so easy to obtain a position from which to drink. Men, cattle, and even birds, except the swallows, which often drink on the wing (unless they are only seizing gnats' eggs, which the way that they dip their beaks again and again at the same place seems rather to negative), need proper "watering-places." Even on a river like the Thames you will only find regular birds' drinking-places at considerable intervals, and the same is often the case on small streams if the banks are at all steep, and by the drains of fresh-water marshes. The bird needs a platform almost level with the water from which to bend down its head and drink. It also very much dislikes drinking in any place where there is a steep bank *behind* it. Thus on the Thames cautious birds, such as rooks, pigeons, and peewits, will not drink at the foot of the ordinary steep bank three or four feet high, but nearly always select a cattle watering-place with a smooth adit. Otherwise they are liable to surprise by persons coming suddenly up behind them.

In the tropical forest it is believed that the birds living on the tops of the gigantic trees find part of their drinking water in the cups of the large pitcher-shaped flowers and fungi which grow on them, in which even small molluscs and other water creatures are found.

It is a great mistake, and a cause of much unintentional cruelty, to think that parrots never drink. They do, and require clean water, and plenty of it.

Even such desert-loving birds as the sand-grouse fly daily to the drinking-pools. Mr. J. A. Bryden gives a

charming description of the coming of the flocks of these swift and swallow-like birds to the "pans" in the dried-up veldt of South Africa, whither they fly in thousands to drink.

Water-birds drink quite as eagerly as others. When an eminent Yorkshire politician and Temperance leader was delivering a more than usually eloquent speech, one of the audience remarked admiringly: "Eh! he's 'ad a sup o' warter to-day, has Ed'ard!" Whatever its stimulating effects in this instance, there seems no doubt that ducks of all kinds regard a "sup o' warter" as an indispensable preliminary to any enterprise whatever. They drink and turn up their eyes in ecstasy when they enter the water, and again before leaving it; before eating, and after eating; before beginning a water tournament, and after it. Medical men say that sipping water gently stimulates the brain. Apparently the ducks think so too.

CHAPTER XIV

HOW ANIMALS LEARNT TO CLIMB

AMONG the forest tribes of India there is one "parish" which elects its chief on principles not mentioned in the most exhaustive treatise on village communities. It is set deep in the forest, and in the centre of the clearing stands one enormous tree, with a branchless trunk running up straight for some 150 feet. This giant tree supplies what may be called the communal fund of the tribe, for among its branches the wild bees have built their combs for generations, and as the tree and the village grow older together, and the claimants on the fund increase, so do the number and weight of the combs from the labour of the procreant bees. The only human work needed to gather the harvest of wax—the honey they value little—is that required to climb the towering tree, and when once there, to smoke the bees and shake down the wax. Consequently, the election of the headman is determined in the first instance by his skill as a climber; and though after election he usually succeeds in investing his office with religious or magical sanction, and endeavours to bequeath it to his son, there is no reason why the post should not be put up to free competition, and awarded, at least in its qualifying

stages, to the man who "did" the tree in the best time on record.

Climbing runs in families, for steeple-jacks are often the sons of fathers who were in the business; but it is somewhat odd that man, though he learns to swim so well that armed only with a knife he can encounter a shark in its native element, and, judged by the extent of his mining operations in comparison with his own size, is a good worker underground, has never become a good climber, or shown the slightest tendency to become arboreal, as he has become aquatic and subterranean.

South Sea babies that cannot walk will roll into the sea and swim; collier boys at fourteen will take pick and lamp and descend into the mine almost as naturally as young moles; but we believe that, in spite of the danger from wild beasts in forest regions, and the fact that in such places there is ten times more life on the level of the tree-tops than on the ground, there is no single instance of a tribe which, properly speaking, has become arboreal and learnt to climb like monkeys. Though not a few make huts in trees, they approach these by ladders; and unless in their huts, which they use as a refuge and sleeping-place, they spend their time on the ground.

Even in forests where the upper levels of the trees are so closely laced together that a comparatively slight adaptation would enable the Indians to progress from tree to tree, and where nearly the whole of the fruit, and the greater part of the birds and animals used for food are found only in this "upper story," man is not,

and always refuses to become, a "climbing animal." Natural repugnance to this form of enterprise seems characteristic of savage men, and even of animals which run no risks whatever.

African natives who have only lived in one-storied huts show the greatest dislike to going up stairs, and have been known to creep up on hands and knees, while large dogs when required to ascend stairs for the first time often refuse to do so except under strong persuasion and with evident reluctance. A half-bred greyhound, now immortalised in a well-known statue of Artemis, would refuse absolutely to descend the stairs when she had once gone up, and had to be *carried* down.

In the case of the dog, this dislike to the very modified form of climbing needed for ascending a staircase can be accounted for on physical grounds. A very slight fall, even a jump from a cart, will snap a dog's foreleg below the shoulder, and it seems aware of the danger. A fox has not the slightest disinclination to run these risks; it climbs easily and leaps down lightly, and though not equipped like a cat for "swarming" a trunk, one was seen by Mr. Tom Smith, when Master of the Craven hounds, sitting at a height of 17 feet in a straight-stemmed beech-tree with only small horizontal branches to aid the climb.

That this art was acquired by animals with far greater difficulty and effort than that of swimming, is evident by the limited number in the same class which have managed to become expert climbers. All the

rodents, including even the guinea-pig, are good swimmers. The number which can climb is far more limited, and the line seems drawn not by lack of physical equipment, but by lack of experience, or possibly of the desire to do so. There is, for instance, a regular series, from the tree squirrels through the ground squirrels to the prairie-dogs and marmots, of very closely allied rodents. The squirrels are at the head of the second rank of climbers, though the lack of "swinging power" in their arms puts them below the monkeys. The ground squirrels can climb trees well enough, though they are terrestrial. But the prairie-dogs and marmots, though the former are almost as well equipped for climbing as a rat, have never properly learnt the art, and though not afraid to try, the former come to most lamentable grief in their experiments. Probably the prairie-dogs, which live mainly on level and treeless plains, never have occasion in their lives either to jump or to climb. When loose in a house they try to do both. Being well equipped with claws, and very active, they manage the climbing well enough. But as they have never learnt either to jump or to judge distance, or that smooth upright surfaces offer no hold on alighting, they generally miss their object, and fall violently to the ground. This would not matter, were it not that, as they have large and heavy heads, they usually fall on these, and either stun themselves or break their teeth.

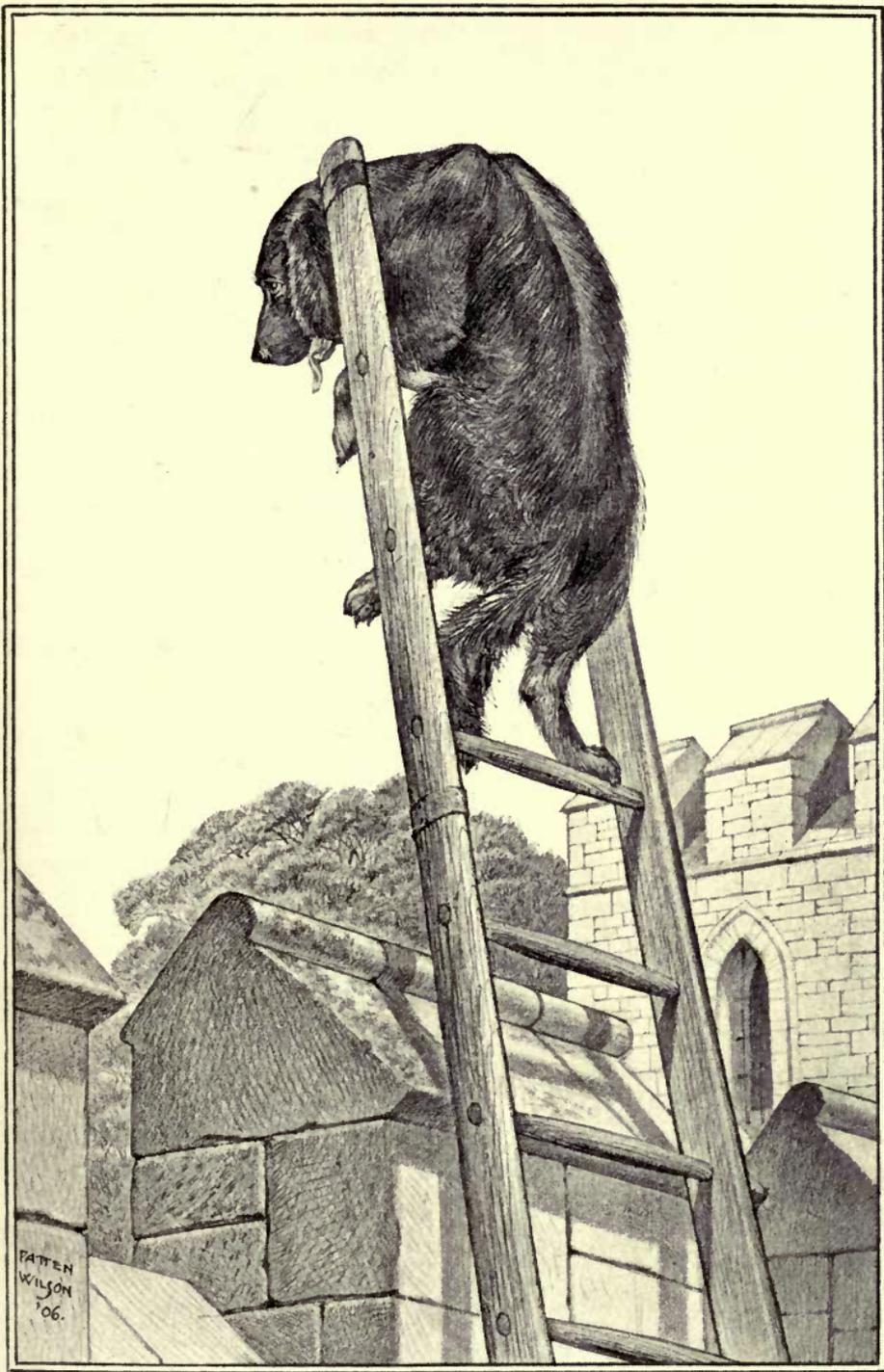
This instance of climbing in the experimental stage would be more interesting did we know how the Australian rabbits first learnt to climb, and whether

they incurred similar failures and accidents. There is no doubt that the great difficulty of the second stage of their acquirement of the art was to learn how to climb down again. Some climbing animals have even now not learnt to come down properly, though adepts at going up. The bear always descends a vertical trunk "stern foremost," just as a man does; so do some of the opossums, the racoon (generally), and the domestic cat, though a leopard will run down a vertical trunk with no more hesitation than a nut-hatch would show. A frightened cat will run up into a position from which it cannot descend at all, either among the small branches of a tree or on buildings.

In the same way a cocker spaniel belonging to the writer once followed him unnoticed up a ladder leading on to the roof of a high building. The end of the ladder stuck up for some feet above the level of the roof, and when poor Jessie reached the top she remained there, almost paralysed with fear, unable to turn back, and afraid to jump between the rungs on to the leads. Her terrified yelps soon drew attention to her position, but of course she had to be carried down the ladder that she had so readily ascended.

Lateral movement among trees is for all animals a far more difficult feat than vertical ascent or descent. Unless the boughs of one tree touch those of another, the creature must learn to jump, with the certainty of a fall if it misses, either on alighting or in "taking off." The "take off" is, we believe, the main diffi-

... ..



“UNABLE TO TURN BACK AND AFRAID TO JUMP ON TO THE LEADS.”

culty. Except in the case of the tree-kangaroo, a considerable modification of the hind-foot into something like the palm of a hand, or an equipment of sharp claws, to act like the nails in an Alpine climber's boots and prevent slipping, is usual in the creatures which excel in lateral climbing. The cat and the bear, the lynx, stoat, ferret, and rat are all as yet imperfect in this branch of their business. The marten, on the other hand, excels even the squirrel in this acrobatic feat, for the squirrel naturally seeks to escape the marten or sable in this way, yet these small carnivora make the squirrel their principal food.

Tigers probably refuse to climb because their weight is so great as to make any fall dangerous to a limb. The bears, of which the grizzly climbs little, would run the same danger had not they acquired a special facility for rolling up first their limbs, and then their bodies, into something like the initial curve of a collapsing hedgehog, which preserves the bones from injury. A bear will voluntarily roll over almost precipitous rocks and pick itself up at the bottom no worse for its fall.

No animal with hoofs can climb a tree, though a goat very nearly succeeds in this, and the writer has seen a pig climb out of a sty over a paling of boards six feet high, with interstices between each of the boards, and three cross-pieces of wood. The pig scrambled up just as a dog might, and when the fore-feet were over the top of the fence, gave itself a hoist and a wriggle and rolled over, dropping on its feet.

The climbing birds seem past masters of their busi-

ness, with the exception of some of the parrots. These are clearly not yet fully accustomed to the work; for every grey parrot climbs with the aid of its beak; and so dependent is it on this, that, even when crawling on the ground, a parrot will pull itself along from one projection or piece of furniture to another by laying hold with its bill.

CHAPTER XV

CROSSBILLS AT WORK

THOUGH comparatively few persons in this country have ever seen a wild crossbill, no mediæval legend is better known than that which dates its metamorphosis from the scene on Calvary, and claims that its crossed bill and blood-red breast were gained on the day when the bird tried to wrench the nails from the feet of the crucified Redeemer. Buffon termed the beak of the crossbill a deformity of Nature, but Yarrell watched the birds at work in captivity, and described the means by which the crossed and loosely jointed beak is used to extract the seeds from the close-set and unyielding segments of the cones of the Northern pine.

Few birds found in these islands are more interesting, or more suggestive of other types and climates, than the crossbills. Though they belong by rights to the Northern forest, they are ever ready to establish and maintain themselves wherever their favourite, and almost sole food in winter—the pine seeds—can be found. They have a colony in the high Pyrenees, and others in the Alps. They inhabit the great pine forests which run from Central Europe across Siberia, and haunt the pine mountains of Japan and the uplands

of Formosa. In Great Britain their main home is in the woods of Sutherlandshire, while others have dwelt for centuries in the remains of the great Caledonian forest near Rothiemurchus.

But at all times the crossbills are the very gipsies of the bird world, ready at any moment to wander into the most distant lands, where their strange forms and unfamiliar plumage are at once the object of comment and chronicle. Matthew Paris recorded an invasion of birds with red plumage and beaks like forceps, beaks which they used to cut apples in two and eat the pips; and in the early autumn of 1822, 1825, and 1826 they appeared in flocks, like red and green parrots, in Denmark, Holland, and France. In one of these gipsy movements made recently the crossbills seem to have come to the South of England, and there to have discovered certain places in which they propose to stop. One of these is the Royal Forest of Parkhurst in the Isle of Wight, a wood largely planted with Scotch firs. The other is the great pine-wood of Bournemouth.

Their presence among the Bournemouth woods was recorded some ten years ago in the *Spectator*; and there is little doubt that though their quiet movements, the height of the pines, and the peculiar adaptation of their plumage, brilliant as it is, to the reds and greens of pine shoots and leaves, have caused them to escape the notice of the residents there, their numbers have continued to increase. From the Bournemouth cliffs to the Isle of Wight and Parkhurst Forest is a natural autumn excursion for the birds, and in the latter they



CROSSBILLS AT WORK.

now enjoy the benefit of complete protection by a special Order made by the Secretary of State. Thence small flocks now roam into different parts of the island in early autumn. With one of these companies of crossbills the writer was recently able to spend a whole summer day, in surroundings which made it possible to watch their "life and conversation" very closely.

The flock of crossbills numbered twenty-three, and were at once distinguished from other birds by their flight, their notes, and by the brilliant red plumage of the old cock birds. Even in the matter of colour the crossbills are much more like parrots than any other European bird, and their movements and way of feeding suggest the same idea. Closer observation shows differences; but, on the whole, the resemblance is so strong as to make a day with the crossbills suggest scenes very different from those in which they were found.

Three small groups of young pine-trees, from 12 feet to 20 feet high, were the attraction which drew them to the spot. When disturbed in one group they flew to the next, except at 10 A.M. and 2 P.M., when the whole company flew off like a flock of snow-buntings and rested in some oaks near. When feeding they were so tame as to continue at work within a few feet of those who watched them, and the trees seemed full of the birds. They worked silently, the only sounds being the fluttering of their wings as they fell through the branches still holding a cone which had broken as they were examining it, the dry rustle of falling cones, and a husking sound, exactly like

that made by parrots feeding on bird-seed. When tired of work they would run out on to the outer tufts of the pine branches and sun themselves quietly for a few minutes before resuming operations.

Their striking and characteristic plumage was then clearly seen. The general character of the colouring of these Northern substitutes for parrots is that the male birds are a more or less brilliant rosy red. The shades vary through all grades from rose colour to rusty brown or orange-brown, but an old cock cross-bill *ought* to carry rose colour in many parts of his plumage, especially on those parts of the back above the tail and under the long feathers of the wing. Many of these Isle of Wight crossbills wore this garment in most resplendent fashion, the brightest and most brilliant tint showing constantly when they fluttered their wings and showed the parts beneath, as they tried to balance themselves on the tips of the pine shoots. Others sitting sunning themselves looked like big red fruit on the trees.

The females and young birds were all green, like a greenfinch, but with a very marked difference. The plumage is not compact like that of other finches, but soft, and with no edges or shapes of feathers showing anywhere. The dull mossy green of the head, and especially of the breast, was marked with blurred stripes like those on the long-eared owl—also a pine-haunting bird, and closely resembling the colour and markings of some of the odd New Zealand parrots which live among mosses and ferns. This striped loose plumage harmonises so exactly with the tint of the pine-needles

that the birds are almost invisible when at work, while even the red and orange-brown of the cocks is much less visible than might be supposed, for this matches the bright red-brown of the young pine-shoots and the bark of the branches.

In the low trees among which the crossbills spent their day it was possible to see at close quarters their method of dealing with the fir-cones and extracting the seed.

Many of the cones had fallen and were lying on the ground. These the birds carefully searched for. Half-a-dozen, both red and green birds, would descend on to the bed of pine-needles and inspect the cones. We do not remember to have read any account of crossbills working on the ground. They are less parrot-like than when in the branches, for they hop instead of creeping like a parrot. But if a cone is searched where it lies, the bird throws one foot over it just as a parrot does, rests its breast across it, and thrusts its mandibles very deliberately into the interstices, just like a parrot feeding. Often the bird picks up a cone in its beak and flies into a low branch of a pine to extract the seeds there. When feeding on the tree itself, the bird holds the cone firmly in one foot, trying not to detach it from the bough, and searches every side, sometimes hanging head downwards, sometimes tail downwards, and if the cone becomes detached, keeping its grasp, and fluttering down through the pine-tufts till it can catch hold of one with its disengaged foot.

This constant fluttering and falling would break stiffer and closer feathers than those of the crossbill. As it is, the looser ones give way, while the stiff tail and wing feathers do become ragged and broken.

While the flock were at work the grove was quite silent, except for the constant fluttering, and the falling of the cones which they had detached by accident or finished searching. So close were the birds that they could be seen "husking" the seeds when extracted, and it was noticed that their beaks showed various degrees of length and crossing of the mandible. In more than one the tips did not project beyond the depth of the other mandible, and it was only when the bird looked "full face" at its visitors that the crossing was visible. About one-sixteenth of an inch was the average overlap.

The difficulty of extracting the seed by any other means than those provided by the peculiar bill of these birds must be very great. So tough and rigid are the *louvres* of the cone that, unless they gape from ripeness, the seed cannot be extracted without the greatest difficulty even with a strong knife. Beyond the fortification of these rigid *louvres* of wood, the seed itself lies in a special little socket, in the very core of the cone. According to Yarrell, the bird first opens its beak until the points do *not* cross, this being possible because the mandibles have some lateral play. It then pushes this in like a wedge, wrenches the mandibles crosswise again, and so prising open the crack, extracts the seed.

The seed itself lies at the base of a little wing, like

that of a small dragon-fly, and the birds manage to extract this without breaking it, or the light husk which envelops the kernel. They could be seen "husking" this, and pushing the "wing" and the husk out of their mouths with their tongues, just as a parrot does. The kernel, when extracted, is no larger than a mustard seed, and tastes like a morsel of Brazil-nut flavoured with turpentine. The crossbills evidently consider it very delicious, and would not taste buckwheat seeds, which were inserted into cones as an experiment. The apples which they are usually accused of destroying were perhaps not ripe enough to attract them, for neither these nor the peaches which were hanging in numbers on the walls close by could tempt them from the resinous dainty of the pine-trees.

CHAPTER XVI

THE SENSE OF DIRECTION

WHEN the pageant of the year is almost over, and autumn decks the leaves in their brightest colours to say farewell, we watch the twittering swallows gather in companies on our roofs, ere they pass in the night and are no more seen. And year after year, when the cold and darkness of winter are past and the hum of insects is heard again in the air, the warmth-loving birds come once more back to nest under the very eaves which gave them welcome before.

But though years of patient inquiry have taught where they go when they leave us, and even the routes they travel by are known, we know not what power impels them unerringly forward, straight to the far-distant point they have chosen as their winter home.

So far as we can see, they must possess *a sense of direction*, shared by all migratory birds, and in a lesser degree by some other animals and certain races of men. The possession of such a sense would account equally well for the long flights of homing pigeons, and to many people seems the only possible explanation of their performances. But one of the highest practical authorities on the subject has always emphasised the rational side of the homing pigeons' flight, and maintaining that they require training over

the whole of the distance they are to fly, draws a broad distinction between the homing of individual birds and the instinct which directs migration, common to every individual of a species. It is doubtful if this distinction can be maintained, for not only are there well-authenticated cases in which untrained pigeons have "homed" long distances, but the very methods of pigeon-training go far to show that the birds possess a sense of direction.

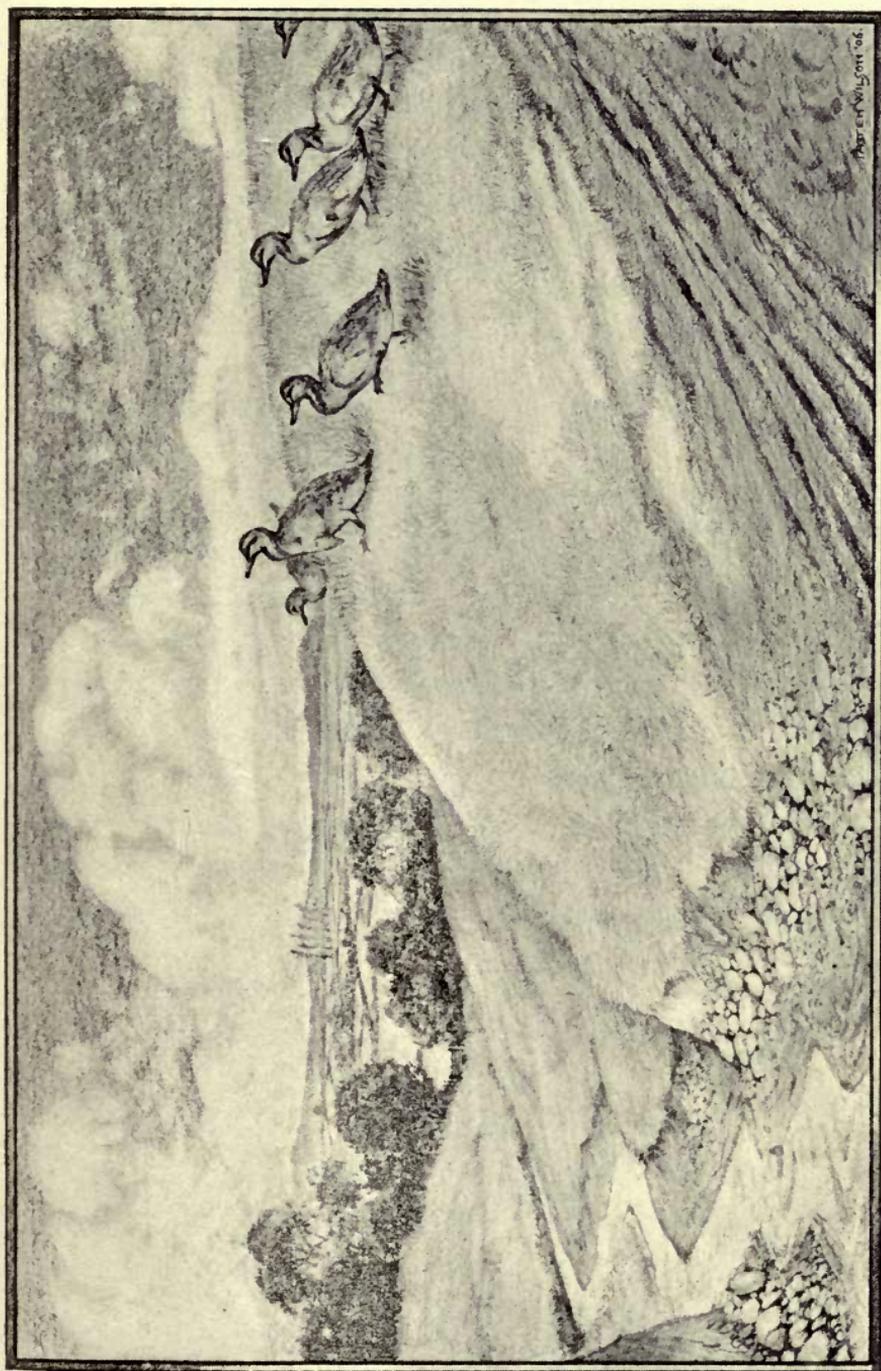
If homers were only trained over short stages, say, eight to ten miles at a time, they might actually learn the whole of their route by sight; but they are occasionally flown from Brighton to London at the first toss without any intermediate stages, so that if they are not guided by any sense of direction, they must be conceded powers of sight which would be at least as wonderful. Under perfect atmospheric conditions it would, no doubt, be possible from a height of only a few hundred feet above Brighton to see on the horizon a dark mass which would represent London; but how, failing a sense of direction, could a bird which had never seen the great city from such an aspect before possibly know what that mass represented, much less recognise in it any particular London landmarks? Moreover, if the best authenticated examples of the homing instinct in various birds and animals are graded and classified, we believe that the results will show, on a graduated scale, the connection between the least remarkable instances which can be explained by reference to experience or reasoning power, and the most remarkable, such as the migration of birds by night across wide intervals of sea, in

which the sense of sight is in abeyance, and some other guiding power independent of visible landmarks must be assumed to exist.

A rather striking, but not inexplicable, group of cases comprises most instances of foxes, dogs, and other quadrupeds which, after removal to considerable distances, have found their way back to their original homes. The Duke of Beaufort's vixen, which returned from Badminton across the Severn to its old quarters in the Forest of Dean, is typical of this class of "returning animals," though this case is far less extraordinary than that of a fox which returned from Sussex to its original home on Lord Hothfield's estate in Northumberland. Both the fox and the dog are exceptionally intelligent animals; and given a strong original faculty for finding their way across country, the roaming propensity of foxes at certain seasons and the reasoning powers of the dog must be held to account for much of their success in returning home from exile. Probably the following instance of homing by young wild-ducks should come into the same group, as the distance traversed was comparatively short, and the little birds may have been able to ask their way.

The ducklings, numbering about three hundred, were hatched in incubators, reared under hens, and kept in a rearing field with young pheasants, away from any pond, until about five weeks old. They were then packed in hampers, placed in a cart, and driven along a rather circuitous route to a large pond in a park about half a mile away. Between the park and the rearing field there are large kitchen-gardens intersected by several

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“THE DUCKLINGS TOOK A BEE LINE STRAIGHT FOR THEIR DESTINATION.”

walls, and beyond those a farm homestead, a small wood, two or three fields, and a high-road with banks and hedges on each side of it. By the evening most of the ducklings were back in the rearing field, too exhausted to quack, and others on their way; but *none* of them returned along the road they had gone by, and as far as obstacles would allow, they took a bee-line straight for their destination.

In the second class of instances experience plays a large part; but an original faculty prior to experience is conceded by the most competent observers. In this group are comprised all the feats of the domesticated homing pigeons, of whose original and surviving faculty of return, unaided by experience, the following two examples, given by Mr. James Huie of Glasgow, in a paper on the Antwerp carrier-pigeon which appeared in the *Journal of Horticulture*, may be quoted. Some Antwerp homing pigeons, brought from the Continent, were kept by Mr. Huie in Glasgow. After three years some young birds were sent from Glasgow, *viâ* Manchester, to Ledbury in Herefordshire. At Ledbury these pigeons were kept confined until they were sitting on a second brood of eggs. Then they were liberated, and were found back at their home in Glasgow two days later. They had never been trained, and their experience of the journey was limited to what they could ascertain from inside their hamper. In the *Fanciers' Chronicle* of August 20, 1880, a still more striking instance of a long return-flight of an untrained pigeon was recorded by Mr. J. P. Taylor of Moss Croft, Gateshead-on-Tyne. He bought some homing

pigeons of a Mr. Mills in Brussels in February 1879. On 8th August 1880 one of these birds was set at liberty, and on the morning of 11th August it was back in its loft in Brussels, a distance of four hundred miles. This pigeon was a hen bird three years old.

While training seems to be nearly always necessary, and the above cases are rather exceptional, they still indicate the direction in which the origin of the homing power is to be sought. It is instinct modified by domestication. It *occasionally* survives in full force even in so long domesticated a species as the pigeon; but as a rule it is only the capacity for training which is transmitted. Incidentally it should be noticed that this acquired, or regained, faculty is transmitted; for whereas sixty years ago twenty-five miles was considered a creditable flight, the birds are now easily trained up to one hundred miles in their first season.

A third class of examples comprises the instances of the homing faculty in man. The instances have for a general feature the fact that this faculty is most developed in the least "reasoning" races, and seems, if not purely instinctive, to proceed from intuition to action, without any intervening process of reason or debate.

One instance shows clearly how common reasoning kills the faculty. We quote Mr. Stillman's account of his early experiences in the forest of the Adirondacks, where by much solitary adventure he had gained the homing faculty without reference to landmarks.

"I had set out with my skiff to explore the course of a stream which meandered through a forest

absolutely unexplored. I abandoned the boat and the stream to ascertain if a short cut and 'carry' might not lead to an unencumbered continuation of navigation, and suddenly came on a stream (the same, of course), running, as it seemed, in a contrary direction. In less time than I could tell it I lost all sense of direction, and though the sun was still several hours high, I could not convince myself that it was not shining out of the north, and that to get back to my boat I must go in the direction contrary to that in which I had left it. . . . The agitation which supervened in an instant was little short of insanity." The ordinary course in such an emergency would be to torture the brain with recollection and inferences, and recover the track by an appeal to reason. The traveller, having in his previous wanderings in the forest acquired the "sense of direction," did exactly the opposite. "I sat down, covered my eyes, and had still sufficient command of my nerves to *wait for will to regain the power over reason*; and when I opened my eyes I had my compass again correctly."

The sun was shining, so that by abandoning the minor promptings of reason the traveller might still have regained his course by referring to the sun as guide. But the point is that he regained the sense of direction without it. This instance would be peculiarly interesting in any case, because the homing instinct is seldom developed in a civilised man, and more rarely still in one who is educated and able to record his experiences.

In uncivilised man it is far commoner, and the

following instance of its manifestation in an Australian aboriginal occurred a few years ago in Yorkshire. A gentleman who was interested in ethnology, and had been for some time resident in Australia, when returning to England with his family brought also an aboriginal girl as a domestic servant. They stayed at a house at B—— in the East Riding, and after a few weeks moved on to another house at C——, some fourteen miles away as the crow flies. The journey was made in a closed carriage, and the road was circuitous. A few days later the girl disappeared, and news arrived that she had come back to B——. She had not returned by the road, and did not explain how she found her way, merely stating that she wanted to return there and had come; but such an unusual-looking woman had naturally attracted some attention on the way, and inquiries elsewhere proved that she had come straight across country from one house to the other. There are no large natural obstacles between the two houses, but the country is rather flat and intersected by large ditches, too deep to ford and too wide for most horses to jump. The girl could not cross these except at certain points, but apparently did not lose her way in spite of these diversions.

A correspondent familiar with the Central American forests states that the Indians there rely on experience to find their path. Mr. Selous, on the other hand, declares that "there is one faculty which the Bushmen possess in a remarkable degree, which enables them to find their way, by day or night, through level, pathless forests, where there are no landmarks

whatever, to any point they wish to reach where they have ever been before." This is the homing instinct exactly as we see it developed in animals, and it seems entirely to coincide with the kind of mental projection of the attention to a definite known point, which the "sense of direction" supposes. There is nothing in the *observed* phenomena of the successful homing of wild man in the forest to contradict the assumption that, when once he has mentally fixed the point at which he desires to arrive, he keeps it before him in his mental vision, and "goes for it" without conscious reference to particular landmarks, tokens, or signs. It is open to him to use all these, as the traveller uses the stars when crossing the desert by night; but we believe that in many cases the "homing" man projects himself by a mental effort, which abstracts his attention from landmarks, yet carries him surely to the goal. Into this abstraction particulars and inferences only introduce confusion, as in the position described by Mr. Stillman. The homing of Australian birds over one thousand miles of intervening ocean to the islands of New Zealand, does not seem very far removed in kind from that of the Bushmen, or of Mr. Stillman in his acquired disuse of reasoning, or from the isolated cases of the return of untrained pigeons from a distance. No one acquainted with the recent records of migration claims to have discovered a solution of the faculty of return to a given spot across the open seas. What guides the old birds is the problem at present offered for solution. The case of the young, who are said

to travel back to their parents' home before these start on their journey, we must set aside at present, until it can be proved that the route and time of their migration are separate and distinct.

But given that the bird, flying from Australia to New Zealand, knows, like the Bushman, the place to which it desires to go, the graduated instances of the exercise of the faculty which accomplishes this desire hint the direction in which the answer must be sought. If a civilised Englishman, planted on the sea-sands, can, when blindfolded, walk for some fifty yards almost straight in the direction of a point on which he has previously fixed his gaze, we must assume that he has the sense of direction in its rudimentary form. The ability to do this depends, first, on the actual or mental selection of a point to aim at; secondly, on a sensibility to any deviation from the straight line towards this point. This sensibility is subjective and not objective, and is only liable to distraction and disturbance by landmarks. It should work best in a vacuum. The migrating bird, as it launches itself from the land into the upper air, enjoys a high degree of freedom from those suggestions and hints to the reason supplied by material objects. In its flight by *night* the isolation from physical reminders between the starting-point and the goal is almost complete; and it should be noted that the main source of error to the birds is precisely the occurrence of these material signs, such as the lighthouse on Heligoland, and other beacons set in the sea.

CHAPTER XVII

THE "SIXTH SENSE"

THE recent disaster at San Francisco was so overwhelming, and the destruction which followed it so complete, that all side issues have for the time been forgotten, and as yet no one seems to have troubled to inquire whether either men or animals in the doomed city experienced premonitory symptoms of unrest and apprehension similar to those remembered in the case of other great disturbances of earth or air.

But judging by the history of recent but less serious natural catastrophes, such warnings could scarcely have been absent. The day before the landslide at Amalfi, a lady who had been staying in the hotel refused to remain there for another night because she felt certain that the earth was moving; and a number of cases are on record in which horses, dogs, a monkey, and even ducks, showed signs of panic for a day, two days, or even longer, before the great earthquake on the Riviera in 1897. A lady at Nice remarked the bad condition of the horse she usually drove, and told her coachman to take it home and to bring another in a brougham from the livery-stables for her. The hired horse seemed as timid and as

weak as her own. The driver then said that all the animals were "off their feed." A monkey and other pets at a villa near Villefranche, on Shrove-Tuesday, the day before the shock which destroyed much life and property, refused to enter the house where they were generally anxious to come. They were all spiritless, dull, and scared. A small lapdog which usually sat on the arm of its master's chair at meals refused to occupy its usual seat.

But perhaps the most striking evidence that the animals were in a state of fear was that the cows in the dairies supplying the coast resorts seemed terrified, and the quantity and quality of the milk suffered. As the farmers and peasants of that district are noted for their skill and knowledge in dairying, small facts of this kind affecting the yield of milk and butter would almost certainly be noticed and remembered.

The *Daily News* correspondent was probably quite right in attributing to the lady who refused to stay longer in the hotel at Amalfi a share in the same prescience exhibited by the animals. The high degree of sensibility, more common in woman than in man, would account for this. This sensitiveness to earth-tremors is necessarily uncommon among persons not living in the earthquake zones. They might feel a sense of insecurity and of impending danger, but be unable, owing to previous inexperience, to assign a definite reason for their *malaise*. But after the first shocks of earthquake in that particular disturbance in the Riviera, those who had experienced it instantly became intensely sensitive to the approach of the sub-

sequent shocks, of which there were many. In other words, the same "prescience" was acquired in an incredibly short time, and became a source of great nervous depression and anxiety.

If human beings, with their many interests and pre-occupations, become acutely sensitive to these earth-tremors, it is more than probable that animals, with their few and simple objects of thought to distract their minds from the physical world, and especially domestic animals, which are free from the two anxieties which do occupy the minds of wild animals—namely, the fear of enemies and the search for food—should be instantaneously aware of these coming disturbances. Moreover, earthquake has a peculiarly terrifying effect on animals. They fear the actual movement of the earth, and the terror which some dogs exhibit in thunderstorms is attributable in all probability not to the sound, but to the vibration which this sets up.

In very heavy thunderstorms in the Alps the Swiss cattle, which wander at will on the upper pastures, come galloping down the rocky paths to their milking ground, the example being usually set by *la mère*, the mistress cow of the herd. The goats and sheep often follow them, and it is noted that they do this as a rule only when there is very severe thunder—not in ordinary rainstorms.

During the disastrous series of earthquakes which took place at Agram each shock was preceded first by a general crowing of the cocks, and next by the howls of dogs and of cats, the latter animals for once losing their wonted superiority to every-

day events and making a doleful tumult. This outcry of fear in the animal world before earthquakes has obviously been part of the ordinary tradition of Italy for twenty centuries :—

“Sub pedibus mugire solum et juga cœpta moveri
 Silvarum, visæque canes ululare per umbram
 Adventante dea.”

In the Himalayas the hillmen believe that the animals are endowed with prescience of earthquakes that they may warn mankind. There is some curious evidence that even in this country animals are aware of earthquake shocks when these are not detected by our unexpectant and blunter senses. Not long ago it was reported that there was a shock of earthquake one night at Newmarket. The report met with very little credence; but evidence of a curious kind came from some of the racing stables. It was asserted by the “boys” and some of the men there employed that the horses were extremely and unaccountably uneasy, that they kicked and neighed in an unusual way, and that some were obviously frightened and upset next morning.

We do not know whether the chalk range which runs from Reading, down the Chilterns, and across the East Midlands towards Newmarket, is reputed to be more subject than other parts of England to earth-tremors; but there is some reason to think that this is the case, the evidence being partly based on the movements of water and partly derived from the behaviour of animals. At Shirburn Castle, near

Watlington, under the Chilterns, the shock of the earthquake at Lisbon was distinctly felt, and the waters of the deep moat which surrounds the house were seen to rise on one side and sink on another.

What the effect of this earthquake shock may have been upon domestic animals kept near the castle is not recorded. But on the same chalk range, which overhangs Shirburn and extends along the Thames as far as Caversham, one of the most extraordinary and universal panics ever known among domestic animals in this country occurred quite recently, a panic which can only be explained on the supposition that they felt the premonition of an earthquake, or one of those subterranean sounds which sometimes precede earthquakes.

These hills are a series of sheep farms, the flocks being part of the regular local system of agriculture. One morning the greater number of the flocks, which had been left safe in their folds, were found to have broken out. In some cases they were scattered or had wandered to a distance, but little loss resulted. It is not uncommon for sheep to stampede at night. They will do so if an escaped stag comes to look at the flock, or if strange dogs approach the fold. But when the shepherds met at the next big sheep fair and compared notes, it was found that the range of country over which this panic had occurred was far too extensive for any such explanation to be possible. Nor could it have been mere coincidence. The local papers contented themselves with chronicling the fact, without suggesting a reason. That no earthquake

shock was felt does not make it impossible that the sheep felt or heard some of the common premonitions of earthquake. The roaring sound which sometimes precedes a shock has been heard by human ears at a distance of nearly one hundred and sixty miles from the disturbed area. It is known also that these sounds were once heard for a month in Mexico, with no subsequent shock at all.

It is well known that many sounds, such as the squeaking of bats and the rustle of the grasshopper, are not audible to the ears of some persons, though easily heard by others. Nothing is more probable than that the whisperings of earth and air, to which we are deaf, are heard by the keener animal ears. The supposition that they have a "sixth sense," a hypothesis which arouses a degree of irritation difficult to account for in some minds, need not be raised in this case any more than in the instances in which animals are obviously conscious of coming storms. If many human beings are uneasy at such times, and declare that they "feel" a thunderstorm coming, there need be no doubt whatever that many animals are far longer, earlier, and more acutely alive to the heat and electric tension before a coming cyclone.

CHAPTER XVIII

THE MIND OF A GARDENING ANT

A COLONY of gardening ants was recently established for some time in the insect house at the Zoo. They came from Trinidad, originally in two colonies, but the queen of one died. The two communities were then persuaded to join, and fed up their queen to the dimensions of a house spider. The rest of the society consisted of small yellow working ants, and big policemen ants with large heads. The latter keep the others to their work, and act as foremen. If a ray of sunshine comes in on a cold day, and a dozen workers stop and "loaf" in the warmth, the foremen soon run up and send them about their business, if necessary carrying them some part of the way in their mouths.

The work in which these creatures were mainly occupied was cutting out circular discs of rose-leaf, about the size of the top of a pencil, and carrying them across a long bridge to the nest, to make their garden. As they carry these upright, or sloping over their heads, they have been called "parasol ants." But as they do this when there is no sun at all, it is clear that it is convenience, not shelter from sun, which suggests the position. Arrived at the nest, they go through the whole of the astonishing agricultural

operations which Mr. Belt described in the "Naturalist in Nicaragua," and of which Herr Alfred Möllen collected a number of similar examples among other South American ants. They pulp the rose-leaves, roll them into balls, and heap them in masses in the nest. On these "mushroom-beds" grows a fungus or mould, and on this the ants live. The mushroom-bed, and the process of preparation and growth, could be seen through the glass top of the box in which the ants at the Zoological Gardens were kept. Mr. Belt, after clearly describing the object of these labours, in the book already referred to, reserves his opinion as to the intelligence which directs them. "Many of these actions," he writes, "such as those of two relays of workmen to carry out the ant-food, can scarcely be blind instinct;" and he gives instances of the mistakes made by the ants and of their correction. But he prefers to state the facts rather than to hazard a theory to account for them.

The interesting question suggested by the activities of the gardener ant is whether it consciously uses its intelligence, or, if not, how far "instinct" and reason are working side by side. In endeavouring to solve it, we are confronted at the outset with this difficulty, that the insect mind works on lines remote from our own experience, and exhibits its methods by indications very hard for us to interpret. The aloofness of the insect mind from apprehension by vertebrates' brains perplexes all inquirers. We can range ourselves side by side with the constructive bird, or the engineering beaver. There is sympathy between us and them

both in intelligence and feelings. But the mute and expressionless being which animates the metallic shell of some social insect lives out of relation to our lines of thought. Man and dog may take common action on the same grounds: but we cannot see practical problems eye to eye with an ant.

Our sympathy and common share in the emotions of birds and beasts has very largely helped us to infer their intellectual processes. The border line where love, fear, wants, and desires originate action is common to us with them; and we know that many animals also share with us the æsthetic sense.

In endeavouring to understand the process of thought in insects, we have to subtract the whole of this common ground, and to approach the subject almost—not quite—as if it were working in a different medium. What we do know of their senses seems in some instances to keep us at this impossible distance. Physical inquiry accentuates these differences.

We know, for instance, that the compound eyes of many insects must present objects to them in a different form from that in which we see them. Some ants have no eyes at all, yet go about their daily business quite as well as if they saw. Sir John Lubbock's experiments show that they can smell; but, on the other hand, they cannot hear—or, rather, do not hear the sounds which we hear. They appear also to be mute; but it is quite likely that they utter sounds which we cannot hear. Thus the human world of sounds is non-existent for the ant, and very probably the ant brain is busy with sounds which are

non-existent for us. At the same time they have a different quality of sight, which, if transferred to us, would make us unable to find the Nelson Column in Trafalgar Square.

The result of the gap between the mind of the man who observes and the mind of the insect whose activities he watches has always tended to produce one of two contradictory forms of interpretation.

The first was to assume that, because social bees or ants were engaged in exactly the same activities as human communities, their minds were practically the same as our own; that, in fact, there was something equivalent to human intelligence of a very high order, with necessarily corresponding moral qualities, in the bee; and that for the purposes of this life there was, in fact, a tiny "soul" in each working member of the hive. That soul, if the conclusions of the early naturalists are examined, was clearly a human intelligence metamorphosed. This assumption would explain quite logically the astonishing and incredible perfection of the material side of the life of social insects. It also accounted for the apparently moral ideas of subordination, self-sacrifice, and devotion to duty which their life exhibits. The difficulty in its acceptance was the limitation of this intelligence to a narrow class of actions, outside which this astonishingly brilliant intellect ceased to work at all; and the absence of any evidence beyond that set of acts to show the processes of thought.

This absence of evidence of any thought originating and directing the work of social insects led

also to an exactly opposite conclusion. The actions performed demanded so much mental power, and the evidence of mental action was so slight, and our powers of apprehending functions so aloof from our sensations so limited, that the whole of their complicated life and actions was set down as purely automatic. Every action ascribable to reason, from the making of the hexagonal cell of the honey-bee—in which the utmost carrying capacity is obtained with the least expenditure of material—to the making of “mushroom-beds” by the parasol ants, is thus ascribed to blind obedience to inherited instinct, or knowledge “prior to experience.”

In the light of this conclusion, the ants which make such admirable dwellings and storehouses that they arrest the germination of seeds, or, when needed, permit them to sprout and undergo the exact chemical change needed to turn them into ants' food, and arrest this again at the proper stage; and whose cities are peopled with dependants living on the “crumbs which fall from their table”—there are three hundred species of such ant parasites in Germany alone—are to-day as brainless as the newly hatched cuckoo, which when still blind and naked, at once addresses itself to the task of ejecting its fellow-nestlings.

Both the one and the other of these extreme views are, we think, due mainly to the initial difficulty of apprehending the mental processes of insects in the absence of the signs and tokens by which we understand the working of the brain of vertebrates. It is as if we were trying to receive a message in aerial

telegraphy on a sensitive plate wrongly set. That we can see no evidence of conscious organisation, or of the transmission of ideas, does not prove that work undertaken jointly is not concerted. In the case of bees and ants there is evidence of communication by contact and touch; but many of the more important acts of the community are done without visible communication. There is not the slightest reason to conclude from this that they do *not* communicate. Two wrens are building a nest in a bank. They settle, without conversation of any kind, that they will make the whole of the outside of dead leaves, to match other masses of dead leaves which have been drifted into corners of the bank. The same pair of wrens next year make their nest in a haystack, and decide to make the whole exterior of hay, to match the surroundings. It is an intellectual process, understood by both, carried into action jointly, and without visible communication.

Two years ago some bees swarmed near Holkham Park. The whole swarm took flight, and traversed the park at a considerable height, followed by their owner, who kept them well in sight. They flew on, above the tree-tops, until they came over a certain oak, when the whole flight dropped like a flock of starlings, and entered a small hole leading into a hollow in this tree. They went "in a bee-line" for the tree from the hive in the garden whence they came. No one could possibly credit that there was not some bee to take them there, who had been there before, or that the swarm did not know what they

were doing. This was one of the very rare instances in which our senses suggest what was probably in the minds of the insects. But what of the thousand instances in which this is at present hidden from us?

Another source of error, which supports the theory that insects are machines "wound up to go of themselves," is the fictitious appearance of mechanism, and the likeness to automata which well-organised industrial work usually presents, whether carried on by men or insects. When the object is purely material—and this is the case in a bee-hive as much as in an engineering shop or a pin factory—the more perfect the organisation the more automatic it appears to be. A dozen men at similar machines going through the same movements, or thirty girls rolling cigarettes, if seen through a diminishing-glass reducing them to the size of white ants, would look very mechanical creatures indeed. An enlarged ant, with a pair of unimproved eyes, looking down on thousands of acres of Indian paddy-fields, with brown-skinned creatures creeping about all day mending little banks, and going at night into little huts on bigger banks, might easily conceive them to be mere unintelligent insects, working successfully, on some inherited but now perfectly unintelligent system, to prolong their existence, increase, and multiply.

CHAPTER XIX

THE POWER OF FASCINATION

THE evident facility with which certain animals can capture and kill others which are stronger, fleetier, and to all appearance generally better equipped than themselves, has led to a belief that the latter fall victims to a mysterious form of fascination. Serpents in particular, which have ever been objects of suspicion, are popularly supposed to exercise some baleful influence on their prey; but actual instances of such fascination have seldom been recorded by competent observers. Recently, however, a correspondent in Natal witnessed what seemed to be an instance of complete paralysis by a snake, which he described as follows:—

“Our attention was first attracted by something moving on the branch of a tree, about ten feet above the ground. We then saw it was a Cape cobra, of the deadly kind, standing erect with only the lowest coils of its tail round the branch, with its hood expanded, and swaying from side to side. On going nearer we saw, what we had not noticed before, a pigeon, sitting on the branch, about a yard from the snake. It was perfectly motionless, not crouched on the bough, but standing up, and made not the slightest attempt to fly away. We shot the snake, but neither the fall

of the creature nor the report seemed to 'unfreeze' the pigeon at first. Then it did not fly, but slowly walked along the bough into the centre of the tree, where I suppose it remained until it had recovered from the shock to its nerves."

The above is authentic, and a very uncommon instance of what is generally understood by the popular belief in the power of serpents to exercise this influence on their prey. But it is possible, even in this case, that the bird had been already slightly bitten by the cobra, and that the paralysis may have been physical and not nervous. This idea did not occur to the witness of the scene, and he did not wait to see whether the pigeon ultimately recovered. Its partial recovery when the snake was shot he did see.

If, as is probable, there are occasional instances of suspension of faculties caused by the sudden appearance of so deadly a foe as the snake, they can be accounted for, step by step, by a natural process of emotion and results. But before endeavouring to trace the degrees of such suspension of the natural impulses of flight and escape, it is well to state that cases even of apparent fascination are uncommon, and confined to a very few of the creatures on which snakes feed. The frogs, ducks, and mice on which various serpents at the Zoo are fed are said usually to show no fear at all, and a duck will walk over the python's coils and quack before the creature moves its head to seize it. Rabbits, which are paralysed with fear, and in a sense "fascinated" by the stoat, seem insensible to the danger from the serpent. That, however, may well be because

English rabbits have had no experience of large serpents. In India there is at least one rat which goes in such fear of its life from them that it blocks up its hole with stones when "at home," as it is thought, to keep them out.

The creatures which are said to be the usual objects of fascination by snakes are birds and monkeys. In this selection common belief has probability on its side, because both small birds and monkeys are intensely emotional, quick, and sensitive creatures. Moreover, they have for all time been the prey of tree-climbing snakes. Mr. Kipling's "Hunting of Kaa" puts the idea into dramatic form. There may be evidence that the python goes "hunting," though if he does not, but remains, as "Eha," the Anglo-Indian field-naturalist, says, quiet, and waiting till he can seize a passing jackal or monkey, it does not spoil the story. It is, however, on record that a monkey has been known to drop down in a dead faint when suddenly shown a serpent; and more than one description represents a brood of fledged young birds fluttering and apparently powerless to fly before a snake, with the parent bird dashing so close past its jaws that it is caught.

This can only be accounted for on the same grounds as the impulse which makes persons inclined to throw themselves over precipices. It arises from the momentary breakdown of resolution in the face of an overwhelming danger, or from the rebound of overstretched precaution, which starts back to the furthest limits of abhorrence and then rushes into the jaws of peril. But the temporary paralysis of

faculties is an instance of moral failure in what, up till then, has been a series of reasoned acts.

All weaker creatures pay intense attention to the appearance of a natural enemy. Their first impulse is to *watch* it most intently. Deer, hares, and birds all do this. Concurrently with this watching impulse is that of standing absolutely still. In some cases this develops into crouching, or "sitting" motionless, so that the creature may, while never taking its eye off its enemy, be at the same time invisible. Paralysis of faculties often so far accompanies this attitude that the creature, in its intense apprehension of one danger, becomes oblivious of another. A mountain hare, for instance, watching an eagle, has allowed itself to be picked up by the hand.

The extra "voltage" of fear engendered by the horror of the serpent would be sufficient, when exercised on the nerves of highly sensitive creatures like the smaller birds, so to strain the first series of reasonable acts of watching, immobility, and crouching, that the final logical act, that of flight when discovered, is impossible, the will-power having broken down. The converse of this feeling in the hunted may sometimes be seen in the hunter. Very well-bred pointers have so elaborated the point, which was originally the pause to determine exactly where the bird or hare was sitting, that they often cannot be induced to "break" it and move on to flush the game.

It is not difficult to guess why some dangerous animals induce this paralysing fear in their prey, while others do not. It varies largely in proportion to

the deadly nature of the creature, and its weapons or mode of pursuit. The cat is a more formidable animal than the stoat. But a rabbit or hare shows no more than ordinary fear of the cat. The stoat, on the contrary, often "fascinates," or rather paralyzes, the mental faculties of the rabbit, or even of the courageous rat. It does not always happen, but instances are so common that we need not quote them. A rabbit hunted by a stoat will sit down and squeak till the stoat leisurely kills it; and a rat will often make no fight at all against the same enemy, though it would defend itself against a ferret, which is larger than the stoat. It is the remorseless bloodthirst and courage of the stoat which has won this ascendancy.

There is a common jungle legend that leopards and tigers can fascinate peacocks. Colonel Tytler had an experience which showed that the natives believe in the story. When stalking a peacock he was rather surprised to see how near it allowed him to approach. The bird paid no attention to him, but was gazing intently, as if fascinated, at a little patch of jungle just in front. Looking in the same direction, he saw a leopard stealing on its belly towards the bird, which continued to remain still in the same position. He was greatly surprised, for he had never even heard of leopards in that neighbourhood; but his astonishment was greater when, on his raising his gun, one barrel of which was loaded with ball, and covering the animal, the leopard threw up its paws, and shrieked in a voice hoarse with terror: "Nehin, sahib, nehin; mut chulao" (No, sir, no; don't fire). He said that for a moment he

thought he must be going mad, and all the Indian tales of enchanted princes and fairies, werewolves, and the like flashed through his recollection. The next moment he saw a man very cleverly disguised in a leopard's skin, with a well-stuffed head, and a bow and arrow in one paw, standing before him. The man so dressed was a professional fowler, who said that in that disguise he could always approach near enough to shoot the birds with a bow and arrow, and sometimes to catch them in his hand.

As a cat, when left in a room with a caged bird, can *always* kill it if it gives way to temptation, it is commonly believed that the cat "fascinates" the bird. "How else," asks the sorrowing owner, "could it have hurt the bird, when the cage was so large that its occupant could easily have remained safe in the middle?" The fact is that the cat does exactly the contrary. It frightens the bird into violent movements, and makes it dash from side to side of the cage. Its persecutor strikes with lightning speed at the bird as it dashes against the bars, first on one side and then on the other, until it is wounded and weakened and can be clutched and dragged out. If a bird is killed or injured by a cat when in its cage, quantities of feathers will be found lying about, the result of this clutching and buffeting, whereas when a cat kills a bird in the open it is scarcely "feathered" at all. If the cage is small, the cat climbs on to the top, lies on its belly, and hanging a foreleg down on either side, pursues the same tactics.

Some instances of seeming fascination are simply

due to a curious indifference to danger. Others are real fascination, not caused by fear, but by an irresistible attraction or curiosity which renders the animal subjected to it indifferent to fear.

The behaviour of fish in the presence of pike and crocodiles, creatures most obviously dangerous and most repulsive in appearance, looks like fascination, but is really due to their limited intelligence. Many readers must often have watched the boldness or insensibility of shoals of fish when a big pike is lying close by. The monster, weighing perhaps six or eight pounds, lies perfectly motionless, except for the gentle vibration of its fins, in a clear pond while roach or carp are being fed. The whole shoal, of many score in number, swim past the pike, and struggle for bread within a yard of its jaws, until one slightly injured, or engaged in swallowing an unusually large piece of bread, passes close by. Then the pike makes a rush like a rocket, all the fish start off explosively, leaving one victim in the jaws of the monster, and in two minutes all the survivors will be feeding again.

The crocodile's methods are almost identical. But unlike the pike, which is very conspicuous from the *side*, which is the point of view it presents to the fish, and which any one may see in a good aquarium, the alligator is exactly the colour of the dark mud of tropical rivers, a tint which is imitated by many other water creatures, down to certain tropical water-snails. It seems fully aware of its semi-invisibility, and takes advantage of it in its methods of attack.

Instances of the real fascination exercised by unusual objects on animals of all kinds, from deer to birds, fish, and insects, are extremely common. Carrying lamps for night shooting is about to be prohibited in some States of the Union, so destructive is it to the deer, which *will* approach the light though they have been constantly shot for the greater part of a century by this device. "Lark glitters" seem as irresistible as ever to the migrating flocks passing across France from the North in winter. The Northern larks, which have never seen anything more glittering than a Scandinavian waterfall, hover enchanted over the revolving spindle set with brilliant looking-glass, while the Continental sportsman pours in shot as fast as he can load at the arrested flocks.

CHAPTER XX

THE COURAGE OF THE SMALLER ANIMALS

AMONG animals courage seems to bear no relation to size. Many of the smaller creatures exhibit courage in an astonishing degree, and though in a few animals such as the lemming—which, though no bigger than a field-vole, will attack and bite the boots of any one who interferes with it—or the Tasmanian “devil” this may be due to low brain-power, a great proportion of the smaller creatures are endowed with a large share of brains and courage combined. The weasel tribe, all of which are small animals, are almost the most courageous of any. Unfortunately they are also the most bloodthirsty, and the greater number of their victims are harmless and defenceless creatures. But there are abundant instances on record in which they have attacked, without the slightest hesitation, either man or any large animal whom they considered to be at all likely to do them an injury. The story of Thomas Edwards’s encounter with a polecat in a cave near the coast was written as evidence of the courage of the naturalist. We have always regarded it, from the polecat’s point of view, as an instance of astonishing courage in so small a creature.

In North America one of the largest of the weasel

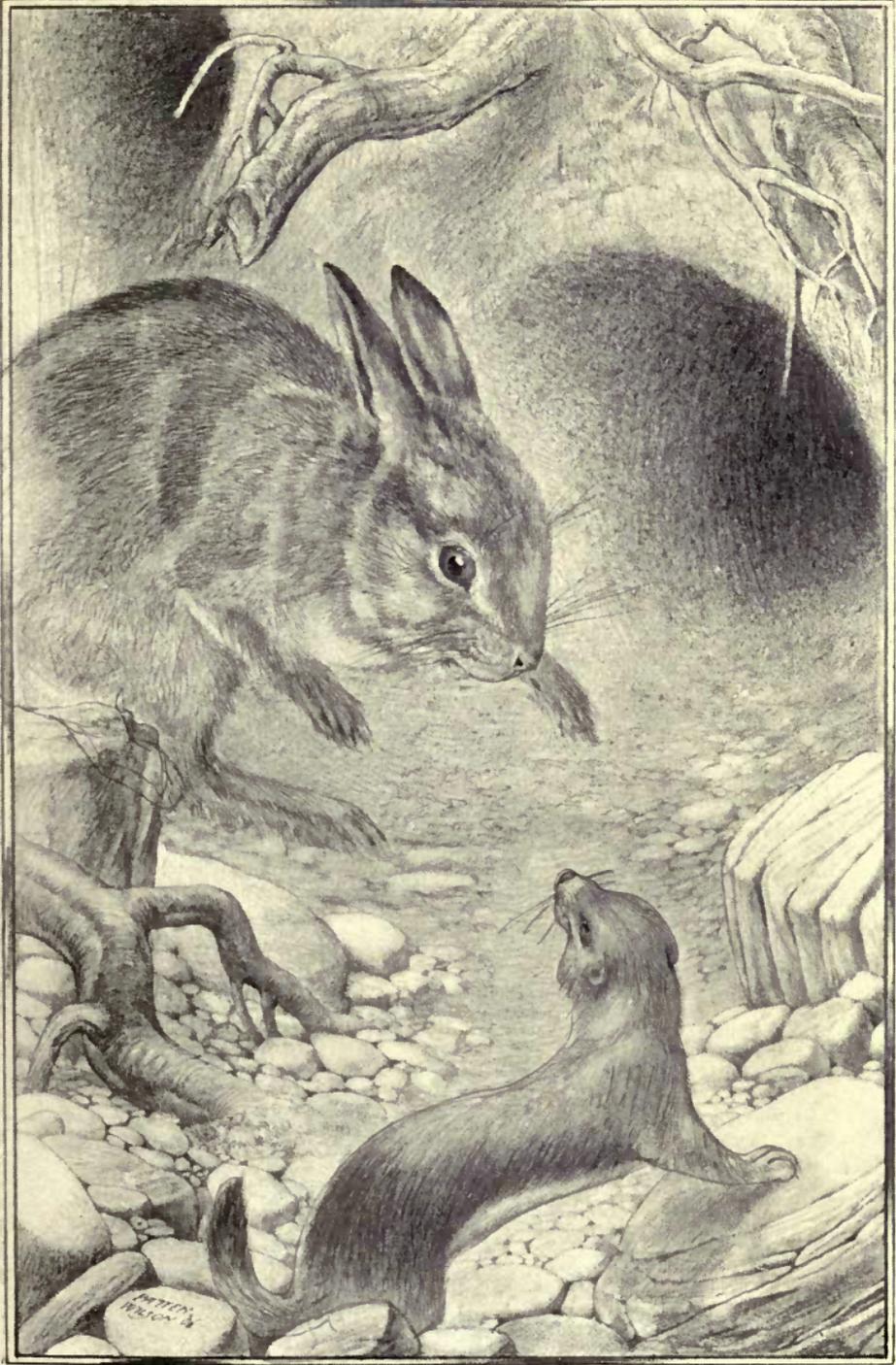
family is the "fisher," a very large, long-furred polecat, living mainly by the water-side, and, like many others of the tribe, very partial to fish. It weighs about 16 lb., and its long, richly coloured fur is exported in great quantities to different parts of Europe, though until recently it was not often used in this country. A trapped fisher will attack any one who comes within reach of the trap chain, and when free will beat off any dog of twice its size. But perhaps the most striking example of the courage of the smaller species yet recorded is that shown by a small variety of jungle cat known as the fishing cat, which, though no relation of the Canadian "fisher," is quite as courageous. One of these, which was kept in a menagerie, broke through into the next cage, and there attacked and killed a leopard, which was three times its own size.

The Indian mongoose possesses all the courage of the polecats, together with amiability and a "regulated" mind. It turns its pluck and prowess to good ends, and we imagine it to stand at the head of the list of the smaller animals if quality as well as quantity is demanded as a mark of intrepidity. There is little doubt that the mongoose realises the deadly nature of the cobra's bite. Its intense excitement is strong evidence of this. But a mongoose has been known to fight just as bravely against other foes. One was seen to attack and drive off a large greyhound which it fancied was hostile to it.

As most of the other small animals know how hopeless is a contest against the strength and per-

tinacity of the weasel tribe, instances of resistance on their part must be classed as courage of a high order. The following example of a rabbit attacking a stoat rests on the first-hand observation of a trustworthy field-naturalist. He was sitting on a log in Gunton Park in Norfolk, near some nettles, when he heard a curious grunting noise in the nettle-bed. Presently a stoat ran out, and almost immediately a rabbit rushed from the nettle-bed and knocked the stoat over. The rabbit then ran back a little, and repeated the odd noise which had been heard before. The stoat picked itself up and ran, not at the rabbit, but towards the nettles. The rabbit rushed at it again, and upset it before it could enter the nettle-bed. It did this four times in all before the stoat was able to get past. When it did so it almost immediately caught and killed a very young rabbit, which the doe had evidently been trying to protect.

The courage of many birds is very remarkable, if allowance is made for their small size and slight means of offence or defence. As a rule size makes no difference whatever in their personal prowess. Many of the smallest are the most intrepid. In the defence of their eggs the blue-tits are the most determined of any English birds. A blue-tit will sit on its nest, though there is plenty of time and opportunity to escape, and wait until its visitor's hand reaches it, when it will at once bite the intruding fingers with the greatest vigour and courage. As most blue-tits' nests are made at the bottom of holes and hollows, there is sometimes no chance for the bird



RABBIT ATTACKING A STOAT.

to leave the eggs. But in the majority of cases there is ample room in the hollow for the little bird to shift to one side, or leave altogether by another entrance. But it scarcely ever chooses to do this. It is not difficult to realise the terrors which the tiny little tit so boldly faces. She sees an enormous arm, some ten times larger round than her own body, coming slowly towards her with outstretched fingers, exactly as the story-books represent the hand of the giant stretched out to catch Tom Thumb. She abides its awful approach without shrinking, and attacks it with all the courage of the Giant-killer himself. The great tit, cole-tit, and marsh-tit are nearly, though not quite, as courageous.

We remember no other British bird which equals them, except perhaps the puffin. But as the puffin has no means of escape when her hole is discovered, she naturally fights and bites "for all she is worth" before allowing herself to be pulled out, or leaving her eggs. Jackdaws, on the other hand, which, like the tits, build in holes, but are large and strong birds, do not attempt to defend their eggs against man; and though owls sometimes offer a sleepy, semi-somnolent resistance, they make little more than a formal protest against ejection.

That any bird should have the courage to do so is sufficiently remarkable; but the courage of the diminutive species is the more astonishing because most small birds have highly nervous temperaments. Their courage is not the result of low brain-power. They thoroughly realise what danger is, and suffer

acutely from nervous apprehension. Cases in which birds have died of fright are well authenticated. The writer has seen an instance of it in the case of a greenfinch seized by a sparrow-hawk. The finch, though not injured by the hawk, which had merely picked it up in its claw, died of fright a few minutes after the hawk was shot. A canary has also been known to die from the same cause when a cat climbed on to its cage.

Next to the snake, the cat is the worst hereditary enemy of the race of birds, and the fear of cats is an inherited instinct with all wild birds. Yet in Argentina there is one species, no larger than a blackbird, which will attack and drive off a cat in the open, if near its nest. This is the oven-bird, which is about the same size as a blackbird, and makes a nest of clay, which is soon baked by the sun into a vessel as hard as pottery. One who resided for some years near Buenos Ayres informed the writer that he has seen an oven-bird with a nest of newly fledged young attack a cat, fly straight at its face, peck and buffet it, and after returning twice to the attack, rout the cat and chase it into the bushes. The cat was "upset" by the attack, not being used to this kind of thing, and tried to avoid the bird.

Such animals as are by temperament suited for domestication are not, as a rule, marked by special traits of courage. The dog is an exception, for most breeds, whether large or small, are very courageous. One of the pluckiest animals we ever knew was a Yorkshire terrier weighing only a few pounds. He

was an indefatigable ratter, and on one occasion went to ground and refused to come out for so long that we began to be seriously alarmed for his safety. When he did appear he was quite unrecognisable, temporarily blind, and scarcely able to walk; for the sticky soil in which he had been working had matted and caked on his long hair till he looked like a lump of yellow clay.

It is true that he was only doing battle with rats, but these must be sufficiently alarming opponents for a dog of a petted lapdog breed, and in his own way he was almost as plucky as the bigger terriers used to drive the badger to the end of his hole and keep him there while the trenches are made to dig the animal out. Far underground, faced by a very much larger and better armed foe, in darkness, heat, and during the last part of the digging in scenes of half-subterranean battle, amid dust and commotion, the terrier meets the charges of the badger, and "holds him up" by barking and demonstration, even if the latter has bitten him badly. Nineteen couple of the Cleveland pack once attacked a badger in the open without doing him any harm whatever before they were whipped off, though many of them were badly bitten. What, then, must be the courage of the diminutive terrier who descends into the ground and faces the badger in the galleries and mines of his own digging?

As a rule we naturally avoid any attempt at domesticating the fighting breeds, and turn our attention to the milder-tempered species: but it is amusing

to note how in these creatures the loss of the fear of man by contact and kindness induces courage. Even the tame dove and domestic pigeon will fight hard against the hand which tries to remove their eggs, pecking vigorously, though when wild the corresponding species take instant flight from the nest. Cases in which domestic poultry have attacked persons whom they considered to be intruders are often noted. But it is less generally known that the game-fowl show a marked degree of courage when in contact with hostile species. The hens are as bold as the cocks; and it is stated that on some of the Scotch islands the only poultry which are kept successfully are game-fowl, as these alone will fight the grey crows, and so protect their eggs and young.

CHAPTER XXI

BENEVOLENCE IN MAN AND BEAST

WITHIN the limits of animal character good qualities so predominate over bad that the world has become almost exacting in its expectations of excellence in their imperfect intelligences. Traits of courage, good temper, fidelity, intense family affection, and a great capacity for friendship, which in cases deserves the name of love, for man, have raised an expectation of other qualities which we should expect to correspond with them.

It is commonly regretted, for instance, that in their society instances of benevolence and practical sympathy with other animals are so rare, a regret based on the assumption that there ought to be a sentiment between one animal and another equivalent to "philanthropy" among mankind.

This feeling scarcely takes into account the complex nature of benevolence, or the lateness of its development in man, or the limits to the possibilities of its development in animal minds. It does not follow that the very general absence of benevolence towards other animals, related or non-related, discredits the animal disposition as it would that of some human community where the sentiment of philanthropy was

unknown. A very slight acquaintance with the history of mankind shows that benevolence is not one of the primitive virtues at all. It appears very late in the history of human progress. Even there its survival and maintenance is always threatened by any rude disturbance of the delicate machinery of daily well-being. It survives and is brought into prominence after temporary calamities. A sudden catastrophe, like the West Indian hurricane, for example, stimulates the sentiment. But in long and enduring suffering, the incidence of which is general, it is matter of common knowledge that the impulse of good-will tends to disappear. This tendency is among the first and more deplorable symptoms caused by any violent collapse of the organised well-being of society.

The instances in which this demoralisation has been kept at bay, and which national pride dwells upon most fondly, are in nearly every case evidence that the sentiment is strongest where it exists both by inheritance and training. The unselfish devotion to others shown by the beleaguered garrisons in the Mutiny, was strengthened and supported by the fact that the greater number of adult non-combatants were English ladies, and that among the men the proportion of those belonging to a class whose standard of moral obligation is a high one was unusually large.

This is not the place to analyse the motives which prompt and maintain such magnificent devotion. But it is certain that few or none of the inducements are other than complex and slowly acquired notions of honour, duty, self-respect, religion, or patriotism, which

are utterly beyond the limits of the animal mind in Nature, except perhaps that of duty, which is only learnt in relation to man by at most one or two animals.

Without multiplying instances of the acquired character of the benevolent impulse in man, it is worth remembering that even civilised races relapse with astonishing pertinacity to the non-benevolent state; and that in cultured Athens the horrible human sacrifices with which the story of ancient Greece is replete survived as a national institution, and that every year a man and a woman were whipped through the streets and then burnt alive to satisfy some such impulse as prompts similar acts among the Congo negroes. At the present moment, the absence of benevolence in any form among the non-developed races of to-day needs no better illustration than the fact, recorded by Captain Hinde, that on the Upper Congo no negro lives beyond forty; that being the age at which their fellow-men directly or indirectly cause their death.

If analogy demands the exercise of benevolence by one animal towards another, it is not quite clear in what sphere this sentiment is to find its realisation. It is clear that we cannot expect it from all animals to all other animals, for the carnivorous creatures naturally act "after their kind." Probably those who would at any rate desire to see this trait would expect to see either a general tendency to mutual aid and comfort among the non-carnivorous warm-blooded creatures, or at least a desire to perform such

good offices among those of the same species. We speak now of animals in a state of Nature, not domesticated. The former is probably an idea quite beyond the range of the ordinary animal mind. It is possible that those of one species feel sorrow when those of another are in trouble or pain. But there is no evidence whatever that wild animals ever do this. There is a kind of chance association on the same feeding-ground, or sometimes under stress of flood or fire. But we can recall no single instance, for example, of a wild animal of one species attempting to *defend* an animal of another, even when they are quite competent to do so. It is doubtful if a case has been recorded of buffaloes charging to protect a wounded antelope, though they will do so to save a wounded member of their own herd; or of elephants, or baboons, or other creatures which live in society, attempting to protect the wounded young of any other species but their own.

Among the creatures which seem to assume the rôle of sentries for the protection of other animals, there is one, the rhinoceros bird, whose behaviour almost justifies the belief that it feels some duty to the antelope or buffalo on whose insect enemies it is feeding; so extraordinary, and apparently organised, is the watch which it maintains. But this is a very restless, active bird, and it is quite possible that its familiarity with the species on whose backs it finds food makes it identify itself to some extent with them. It probably imagines the buffalo to be almost a part of itself. In any case, the instances of in-

difference are so overwhelming that we may set aside the assumption that there is a common sympathy among non-related animals, even when not carnivorous. It is not a defect of character, but of comprehension.

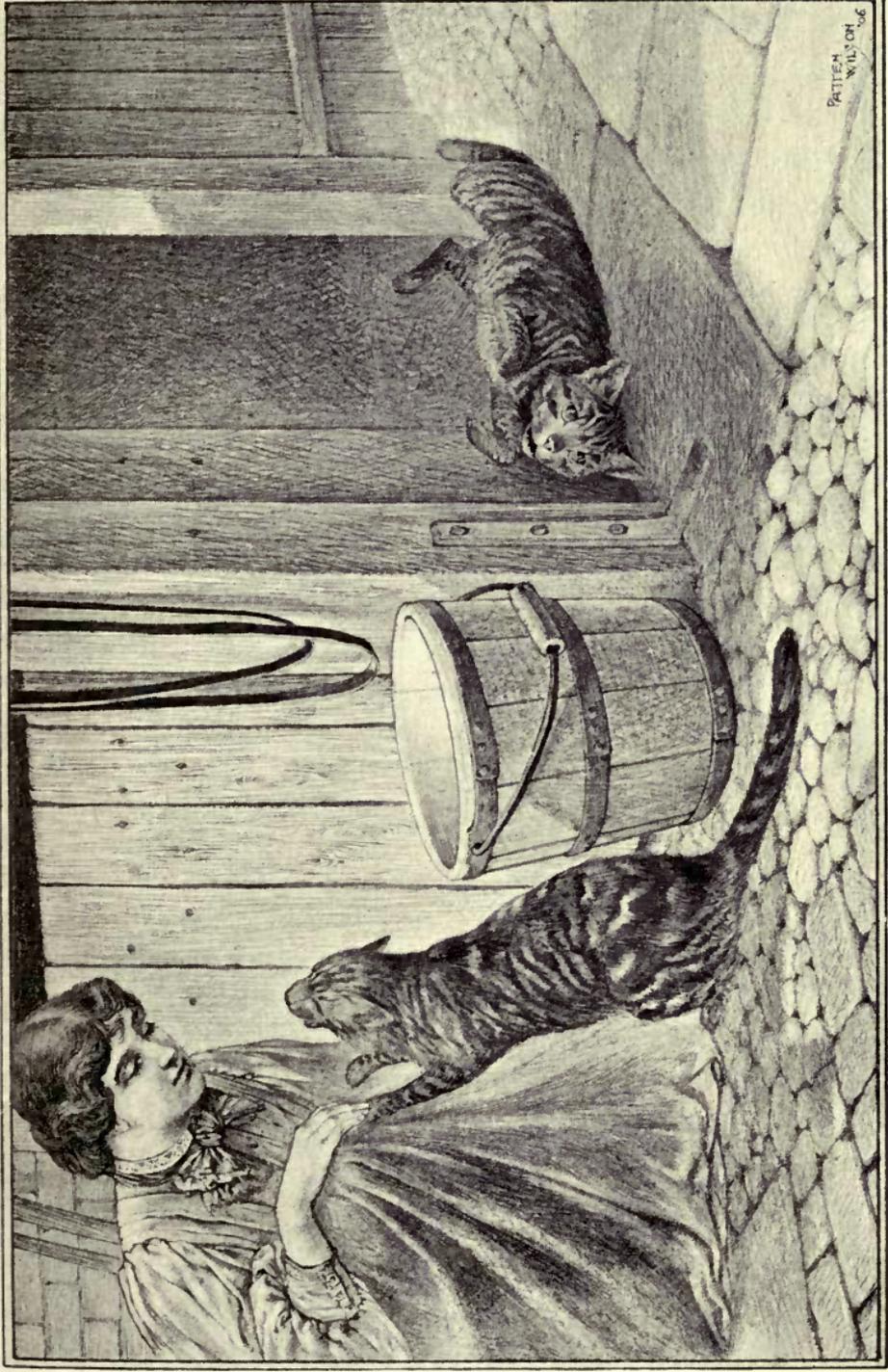
The relations between those of the same species are closer, though exhibitions of helpfulness are by no means general, and instances of positive ill-treatment are common. In spite of this, they are probably exceptional. The monkeys who drown the objectionably sick by shoving them off trees into the river are certainly rather worse than the Greeks who "marooned" Philoctetes for the same reason. But with this should be contrasted Brehm's story of the rescue of the young baboon from his dogs by a patriarch of the troop, and the encouragement given by an older stag to a young one which feared to jump a fence. Lord Lovat gives an admirable description of the latter scene in the volume of the Badminton Library on "Deer-stalking." The old stag reached over towards the young one at last, and "actually kissed him"; but the youngster would not jump.

Animals are so "helpless" themselves when anything goes amiss, especially in cases of accident, that they can hardly be expected to do much for others. But the *impulse* is often there in the related kinds, though it is not extended to the non-related. Otters run round a trapped otter all night. Cats and foxes visit the bodies of their dead, and so do stoats and weasels. It is a rule with trappers to leave these near a trap; so we may conclude that these animals

probably visit their fellows when trapped. The writer once saw an odd instance of this ineffectual concern—probably not very deep, for the actors were sparrows. A brick trap had been set in a yard, and a sparrow caught. All the sparrows in the neighbourhood had learnt it, and were sitting in crowds on hedges, cucumber frames, sheds, and buildings, discussing the situation, or staring moodily at the trap where the captive was imprisoned, but quite invisible. Next day a robin was caught, but the sparrows showed no concern whatever.

This tendency among the wild races finds definite expression among the domesticated animals, though instances are not very common. We have seen a small pig, stuck in a paling through which it had tried to squeeze, assisted by an elder one inside. Attracted by its cries, it took the small pig's head in its mouth and tried to pull it through, in doing which it almost pulled the sufferer's head off. In another case a cat deliberately fetched its owner to assist another cat which was lying helpless in a fit. Moreover, domesticated animals are to some extent "progressive," and have realised the notion of common good among other creatures than their own stock. There is a good deal of service and benevolence among very different domesticated animals, especially in the form of protection, sharing of food, and forbearance. Specialised instances in which dogs or cats have taken food to others could doubtless be authenticated, though the writer has not witnessed a case. But there is the strongest of all evidence that they have a

Illustration



A FRIEND IN NEED.

tendency to perform these and other services to other animals, because the domesticated creatures *voluntarily offer these services of benevolence to man*. How can any one doubt that animals (in domestication) are willing to feed each other, when there are cats all over England and Scotland which delight in bringing food *as presents* to their owners! We need not go back to the historic cat which caught a pigeon every day and brought it to its master when a prisoner in the Tower.

It is the natural impulse, usually of male cats, to do this. The writer has seen it constantly; and if references are needed we need only turn to St. John, who mentions a Highland shepherd whose cat brought him something edible nearly every day in the year.

Not the least interesting fact in the growth of the sense of benevolence in animals is that when it *is* engendered (usually in a rudimentary form, but the same in kind as the virtue which we understand by the word), it is at once diverted naturally from other animals and directed by preference to the service of man. Thus the other creatures benefit only in the smallest degree. Proud of its new idea of being serviceable and beneficent, the animal devotes itself not to other animals, but to its master, who unconsciously absorbs all the benefits which the new "virtue" in the beast prompts it to bestow.

CHAPTER XXII

ODD FRIENDSHIPS

ODD friendships between animals of different kinds are often seen, but an adventure recorded in *Nature* by Mr. L. C. Hurst is rather out of the common. It often happens that among all the domestic animals of a farm the donkey is the cleverest, and takes the lead when anything interesting is going on. One of these sharp-witted donkeys, kept in Derbyshire, had learnt how to open gates, a not uncommon accomplishment of his tribe. Being shut up in a field with two ponies, he soon wanted a change of scene and company, and so opened the gate of his own meadow and walked out with the ponies. He appears to have wished to find another set of companions, for he opened three other gates in order to reach another field where a mare, a foal, and a yearling, all old friends of his, were placed. They no doubt were very pleased to see him, and the whole party went out for a walk. They were then joined by a mastiff, and they went on their way together exactly as animals are supposed to do in story-books—dog, donkey, ponies, mare, yearling, and foal—"until they met a man," to adopt the style consecrated to adventures of this kind. Unfortunately the man knew

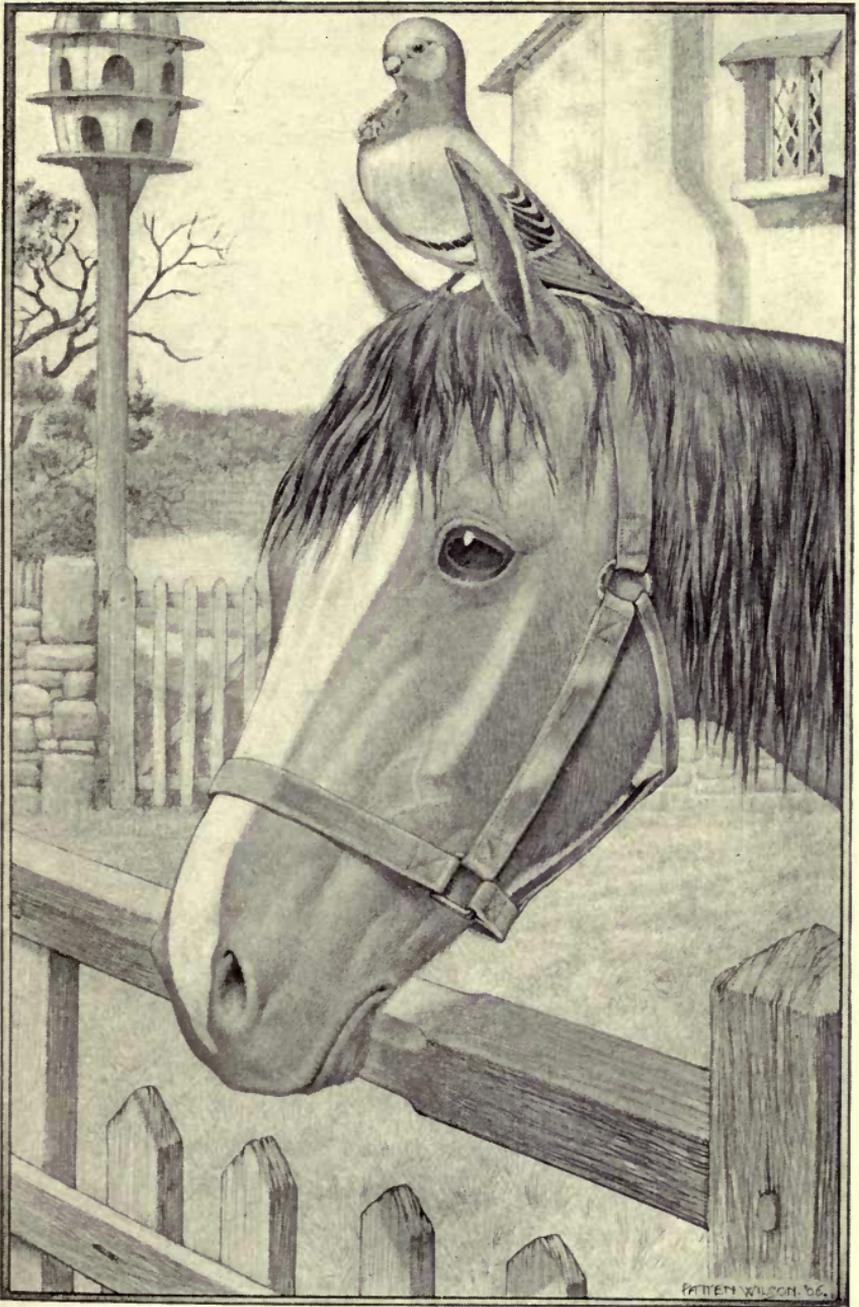
the horses and foal. There are men in the country who will even recognise particular pigs when straying, and the eye for identifying horses seems part of the inheritance of most rustics. He unkindly interfered with the walking tour, and rounded up the equine members of it. The donkey, deprived of his friends, then returned home; but the mastiff accompanied him in an entirely detached manner so far as its original owners went, so great was this donkey's power of making friends, and also of keeping them.

As a rule, domestic animals which are much with people prefer their company to that of other animals of any kind. They think them more interesting and distinguished. An "owl" pigeon, named "Pip," because, like the hero of "Great Expectations," he had been brought up by hand, always preferred human society to that of his own kind. He lived in the house whenever he could, though there were plenty of pigeons outside; and though he occasionally found a mate and set up housekeeping for a time, his domestic arrangements were seldom a success, because he never allowed them to interfere with what he conceived to be his social duties. So long as he was only surrounded by other pigeons he would go on with the nest-building or incubating in a quite exemplary fashion, but immediately a human acquaintance appeared he always stopped work and flew down for a little conversation.

The same bird became very friendly with a horse, and used to sit on his back or between his ears for hours at a time. This was the more curious, because

in a general way it is only animals which are rather disregarded by those about the house that are particularly likely to strike up curious friendships with what would apparently be very unsuitable companions. There was recently at Clifton Hampden, on the Thames, a dog which lived at the Bridge House, but was not in the least interested either in people or in boating. Instead of barking and being important when parties arrived at the boating-raft, or helping to take the tolls at the bridge, or generally taking the active and fussy interest in the business of his master which most dogs show, he preferred to associate entirely with a horse and a donkey kept in a meadow next to the bridge.

The three friends used to spend all day out in the field, the dog lying quietly curled up asleep in the grass if it were fine, or watching the others graze. If it rained he would go and lie against the back of a shed, where he could see the horse, and to which the latter sometimes also came for shelter. He only appeared at the house when the horse was fetched to be harnessed, when he would trot with the cart, and as soon as the horse returned and was unharnessed, would return with it to the field. In time this dog became so extremely "horsey" in his tastes that he took to eating oats when his friend was fed. It was the custom to put the horse's feed of oats in a tin pan and set this on the floating landing-stage or raft used by boating parties, in order to get the old horse to stand in the water for the benefit of his legs; while at the same time the donkey,



“HE BECAME VERY FRIENDLY WITH A HORSE, AND USED TO SIT
BETWEEN HIS EARS FOR HOURS AT A TIME.”

1875

which hated water, could not steal the oats. The dog always went down to the raft, and sat on it close to the tin pan while the horse was eating. He would then pick up the spilled-out grains, and carefully crack and swallow them. Both picking up and cracking an oat-corn are rather difficult feats for a dog's mouth and teeth to manage. But he was very expert at this, and used to sit and eat oats till the horse had finished. The latter died rather suddenly a short time ago, and the dog only survived his friend for a few months, so this scene by the bridge, which used to take place regularly every summer evening, has ceased.

The thoroughness and routine with which this dog-and-horse friendship continued could probably be paralleled in many other cases. There seems to be a natural liking between these two very different species, just as there is a natural antipathy between dogs and cattle. The latter is sometimes explained by an inherited recollection of the destruction of their calves by the dog's relation, the wolf. But as wolves are at least as destructive to foals where horses run loose, the explanation does not seem adequate.

The dog's natural attitude towards the sheep is strictly that of a hungry man towards a leg of mutton. He only becomes its guide, philosopher, and friend by training. Yet between shepherd dogs of the best class—such as those on the Northern fells—and their sheep, there exists a much closer link than between the ordinary sheep-driving dogs of the South and their flocks. These fell sheep are very bright, alert creatures, with

all their wits about them, and scarcely need more than a hint from the dog as to where they should go. In Penrith on market-days in autumn there is a great invasion of sheep, often lambs of the year, which, being bred on the fells, are sold for keeping on the lower ground in winter. Of the three parties to the visit—sheep, dogs, and shepherds—the first are usually quite composed, the dogs almost as much at their ease, and the only members who lose their heads completely are the shepherds, who shriek and scream at their dogs and flocks as if demented. At a cross-road, or if there is much traffic, a sheep sometimes becomes separated from the rest, while the shepherd is frantically waving his arms and stick. The writer has seen one quietly run up beside the dog and push against it, as if to inquire what it had best do. The dog, looking up with his tongue out, evidently concluded that his master did not know either; but after waiting still a minute, he trotted off with the sheep alongside of him to the flock.

Perhaps the most incongruous pair of animal friends at present in England belong to the late Lord Lilford's collection of cranes and wildfowl, still maintained at Lilford Hall, near Oundle. A large crane was selected as the object of an intense and jealous affection by a goose. The goose, which was of a curious Australian species, with a very short bill and speckled body, practically annexed the crane altogether. When the writer last saw it, it was feeding close by the tall crane, and never went more than a few yards from it, or allowed it to be out of its sight for a

minute. If any other crane came near, or any visitor, the goose rushed at it and made as if it would bite. The cranes it did bite, seizing their legs. A mate was found for the crane, and for six months it was kept elsewhere, unseen by the goose. The fresh bird died, and the goose, to whose enclosure the crane returned, at once renewed the friendship. It was quite a personal liking, for there was an unrivalled selection of other cranes to choose from.

When a cat and dog become chums, one or the other is generally a young one. Their chief object in associating seems to be play or boisterous romps, in which the cat submits to very rough treatment as the dog grows more excited, and always seems to enjoy the sport the rougher it is. We have seen a small cat almost swallowed by a full-grown young bloodhound, picked up and flung into the air, and swung almost from one side of the room to the other, still renewing the mimic fight, until, when quite exhausted, she would slip under a bureau to get breath. It seemed as if her bones must get broken, yet she was not damaged.

An Australian opossum and a setter became most excellent comrades, the opossum lying asleep by the setter on the hearthrug by day, and playing with him in the evening. The dog even submitted, though he did not like it, to the opossum washing his face, which it did by licking it all over while it solicitously held the dog's muzzle in its sharp-clawed little paws. The first advances in this case came from the opossum; but the setter was not a normally minded dog, being rather

given to seek friends among the cats, with which he would play at any hour.

Mr. Hagenbeck in his Hamburg Menagerie, partly for the pleasure of the German sight-seer, and partly to make the animals more cheerful by society, has for many years made "happy families" of the largest carnivora in single cages. The greater part do not do much more than tolerate each other, but the social cement of the whole party is given by the dogs, large but young boarhounds, which are full of play and good humour, and seem to keep the others in spirits by their example.

Probably, as dogs are the most companionable creatures to man, they also possess the gift of attracting the liking of other animals. One of the most extraordinary instances of this recently noted was described and illustrated in *Country Life*. A fox cub was brought up among a number of dogs at a house in Wales, with a park and rough cover close to the garden, the latter being a favourite place for the wild foxes to lie by day. The dogs were often taken to draw this cover and rout out the fox. The cub, when full-grown, used to accompany them; and when the fox was started would rush after it in company with the dogs, which were giving tongue and enjoying all the excitement of a brief fox-hunt.

CHAPTER XXIII

DECOY ANIMALS

AMONG the surviving industries of dogs is one dating from an age when the observation of animal idiosyncrasies was sharpened by the keenest sense of their value as aids to man. The decoy-man's dog is the creature which holds this unique position. There are not more than thirty decoys remaining in England, and in these we may assume that there are not more than the same number of trained decoy-men's dogs. Consequently, of the animals brought up to this once flourishing business, this country does not possess more than enough to supply the ordinary demand for pets in the families of a suburban street.

The work which the dog has to do has often been described in books of sport. He appears from behind the screens at the mouth of the little canal or "pipe" leading from the main pool on which the ducks alight, and runs up along the side of the pipe, jumping in and out from behind the screens. The ducks swim after him, "attracted by curiosity," as the authorities on wild-fowling say; and the dog, well trained by his master, leads the dance up the pipe until the birds are driven under the netting. A custom still prevailing at one

of the two last of the Yorkshire duck-decoys suggests a more probable explanation of this use of the dog, and of the odd attraction which its appearance has for the ducks. This particular decoy has preserved apparently a very primitive tradition of decoy-dog training. Before being sent out to show itself to the ducks and to pop in and out from between the screens, the dog is *dressed up like a fox*. It is fitted with a fox's skin and a fox's brush, and then, arrayed as the arch-enemy of all ducks since the Creation, it appears at the mouth of the pipe, and the ducks follow it as gaily as the rats did the Pied Piper of Hamelin. It is usual, by tradition, to use red or liver-coloured dogs for this work. But the use and practice of the Yorkshire decoy shows its origin. It is well known that birds of many kinds which can fly will always "mob" a fox, and plovers will often "mob" a red dog by mistake. But for ducks the fox's presence has a perfect fascination. They cannot help watching it when in sight, and when it is moving away, as the supposed fox does, up the pipe, they swim after it to see where it is going and to take care that it does not steal a march on them.¹

The decoy-ducks which lie out on the lake itself are only tamed wild-ducks, which the others join from the gregarious instinct so strong in birds. The advantage taken of instinct in this case is far less ingenious

¹ There is little doubt that dogs could be employed to decoy cattle in much the same way as ducks. If a strange dog is taken into a pasture where a herd of unhandled steers or heifers are running, they invariably "mob" it, and will follow wherever it goes.

than the original observation which suggested the use of the pseudo-fox as decoy. The knowledge that birds instinctively join other birds of the same kind led to the use of the whole race of "call birds" employed by bird-catchers and fowlers. Their aid is invoked successfully even by amateurs in the everyday business of pigeon-keeping. If a stray pigeon visits a house it generally perches on some part of the roof, whence it takes a survey of the garden, dogs, cats, and other pigeons there. If a little corn is scattered on a window-sill where the latter are used to be fed, and one of the home birds is thrown up on to the roof, it is certain to fly down again to the food, and with it comes the visitor, who cannot endure to be left alone.

If a hawk or falcon is lost, or refuses to come down from a tree, the loosing of another hawk will often bring it again to the lure. Hawks and crows, as well as many small birds, seem to entertain a curious spite against any of their tribe which seem to be in difficulties. If one is taken and pegged down on its back with its feet upwards, another bird of the same species is almost certain to descend upon it and attack it. This is possibly because it imagines that the other bird is offering battle, for if a crow, hawk, or owl is fighting on the ground it generally throws itself on its back, so as to present its most easily defended side to the foe. Readers of Mr. Rudyard Kipling's story of the Hindoo colony of the living dead, will recall the means taken by the prisoners to catch crows for food, and the same method is

practised in England to-day by people who wish to catch kestrels. The bird fastened to the ground instantly grips the other with its claws, partly to defend itself, and partly, perhaps, to obtain a purchase by which it may raise itself from the ground to which it adheres in some way quite incomprehensible to its experience. Parrots are taken in this way in Australia, and there is very little doubt that if a tame eagle were used as a decoy and "pegged out" without hurting it, on its back on the eagle-haunted hills of Spain, others would be caught in the same way. A couple of these birds which found their way to the Zoo were actually taken when locked in this curious embrace after a fight upon the ground.

The progress from the use of these unconscious instruments, to the training of animals to become intelligent assistants in decoying others into the power of man, makes an advance of very many steps up the intellectual ladder of animal intelligence. Yet it is not invariably the creatures credited with higher brain-power than others which are so used. On the cattle ranches of the great West, one of the great difficulties of the cowboys is to induce the animals to enter a train quietly. They can be rounded up and driven to the siding by the ordinary manœuvres of the profession, but to induce a mob of obstinate bullocks and cows to entrain themselves quietly is so difficult that it is not yet understood even in Ireland; and the question has caused a good deal of correspondence in the papers devoted to the great live-stock industry of the island. In Texas they manage this by the use of a trained

decoy. Bullocks are there called "bogeys" for some unexplained reason, and the decoy bogey is as necessary at a station as a stationmaster. It leads each lot of cattle into the small loading pen next the truck which is to be filled, and having taken them in, backs out, stern foremost, at the word of command, when down goes the slip rail and the "lot" are driven on board.

It may be, that the most intelligent and astonishing of all animal collaborators with man in the work of reducing their kind to be his servants, are now as rare as the decoy-men's dogs in England. So little has been heard of the old system lately that it is quite possible that it is no longer in use in India, and that *keddah* work has entirely taken its place. We allude to the method of capturing single wild male elephants by means of trained female decoys. The wild elephants were not necessarily savage or outcasts, but were usually pursued when away from the herd. The decoys carried coils of rope attached to their necks. Their owners rode them till near the scene of action, and they were used whether by day or night. Night was preferred, for the wild elephant was less suspicious, and was easily found by the noise he made when feeding, and by the sound of his striking the grass which he pulled up against his forelegs to get rid of the earth which clung to it. If discovered by day, the tame animals slipped their riders at some distance, and then fed up to the wild one until they could approach and caress him. Then they "kept him in tow" while the noosers slipped up and got the rope fastened to the decoy's neck round the leg of the wild elephant, the

decoy actually assisting in the operation. Something of the kind is done with the half-wild elephants of the King of Siam, when these are driven up for their annual inspection at Ayuthia.

It may be asked, what is the inducement of animals in captivity to take a conscious share in reducing others of their species to the same condition? To us it suggests an act of treachery, or at least of servile submission. The answer is, first, that as long as animals in captivity are given *employment* they do not as a rule think themselves unhappy, or dislike their position. On the contrary, they are proud of their association with man, and prefer his company almost invariably to that of their own kind. Even domestic pigeons, when made pets of, will remain with their owners in preference to going with their kind. The more intelligent animals become eager to serve, and proud of their power to be useful. Like the negro in "Peter Simple" who hands a stick to the sailor, remarking that it will do to "keep off de oder dam nigger," they are pleased to bring others of their race into line with themselves, and take a pride and interest in working to that end. There are many dogs which, if they knew how, would become regular slave-drivers to other animals, and none of them have the slightest compunction in using all their faculties to bring them into the power of the superior being whom they serve.

CHAPTER XXIV

BULLS AND BULL-FIGHTS

THE popular interest which King Alphonso's courtship and marriage aroused in all things Spanish was from the beginning widespread and sincere, and since the fateful wedding-day, which so nearly ended in cruellest tragedy, the popularity of the young king and his bride is such that the British people would fain look upon his country and all its institutions with a favouring eye. But in spite of this the Spanish bull-fight still meets with unqualified disapproval, and when it was announced that the young queen was to attend a State performance on the Sunday after the marriage, it was feared that she might find the ordeal of blood in the Plaza de Toros almost as terrible as the ordeal of fire in the Calle Mayor.

But there is some reason to suppose that, in deference to the feelings of the English princess, the more objectionable features of the Spanish bull-fight were somewhat mitigated on that occasion, for it is significant that photographs of the performance show bulls which are not of the true fighting race. A stuffed specimen of that breed may be seen at the Natural History Museum at South Kensington. It

is a small black animal, as active and determined-looking as our little Jerseys, which indeed it closely resembles. But the bulls shown in the pictures of the recent State bull-fights are wide-horned, light-coloured, and clumsily built, far bigger and heavier than the black breed, but, judging by the analogy of our own light and heavy varieties of cattle, as inferior in fighting power as a Cochin-China fowl is to a gamecock. The unfortunate horses, whose sufferings are such a revolting feature of the bull-fight, would have a much better chance of evading the charge of a comparatively heavy slow animal, and in the absence of the true fighting bulls far fewer horses would be mutilated and sacrificed.

Of late years it seems to have been rather forgotten that bull-fighting is not even now an institution peculiar to Spain. It is not very long since bull-baiting, a peculiarly cruel and cowardly form of pastime, in which the bull was almost powerless to defend himself, was one of our own national amusements; and the ring where bulls were tied up to be worried by dogs on public holidays is still to be seen at Brading, and probably at other towns besides. Such encounters were the more to be condemned because dogs and not men were the bulls' opponents, and it could not be urged in their favour that human prowess or agility were in any way developed by them. Yet all the Latin races seem agreed to see in the bull, the one animal whose courage and strength make it a worthy antagonist for a man just sufficiently armed to supplement quickness and skill to the extent

necessary to protect him from the piercing horns; and though the Spaniards have in modern times invested the encounter in that country with circumstances of revolting cruelty, the form of duel between man and bull as practised elsewhere is by no means the odious and unequal combat which the name now suggests.

In the "Maremma" of Italy it was a natural growth from the main occupation of that strange district. Throughout the line of flat pestilential plains and swamps which stretches along the western coast of the Peninsula, through the Pontine Marshes, down to the extremity of Calabria, huge herds of semi-wild cattle and wild buffaloes are tended by mounted *vaccari* and *buffalari*, armed with long lances to protect themselves from the bulls, which are there at least as savage and dangerous as those kept in the "reserves" of the Spanish nobles to supply the bull-rings of Murcia, Carthagená, or Madrid. In the days of the temporal power of the popes it was the privilege of the boldest of the *vaccari*, after driving their cattle into the towns for sale, to give an exhibition of their skill in facing or checking the furious bulls, and the proceeds of this performance formed part of their remuneration.

In Rome the Anfiteatro Correa, built partly from the materials of the Mausoleum of Augustus in the Campus Martius, was the scene of the *giostra*, as these combats were called. The bulls were kept in the vaults which had once held the ashes of the Cæsars, and in the centre of the arena was the pyramid that was once crowned by the statue of

Augustus. The Italian bull-fight was a fine exhibition of courage on the part of the *giostratori*, with none of the cruelty of the Spanish arena. The men, dressed in white, with red sashes, and armed only with short sticks tipped with flags, faced the bull the moment it was released from the den; the only place of refuge available being a stout post placed in the centre of the ring, round which a bull might be dodged for a short time until another performer distracted its attention. If the animal persevered in following a single man, he escaped by means of iron rings let into the barrier wall. When the bull was tired of pursuit the den was thrown open, and it was allowed to re-enter. The courage of men who, armed only with a stick, braved these Pontine and Campagnan bulls, fresh from their free life and as active as wild animals, seems greater than that called for in any form of athletic competition known to the Teutonic races. The speed and quickness of these animals is such that a well-mounted man has often difficulty in escaping their charge in their native plains. Sir Walter Scott's fine lines on the rush of the wild white bull of Cadzow Chase:—

“ Mightiest of all the beasts of chase
That roam in woody Caledon,
Crashing the forest in his race,
The mountain bull comes thundering on.

Fierce, on the hunter's quivered band
He rolls his eyes of swarthy glow,
Spurns, with black hoof and horn, the sand,
And tosses high his mane of snow,”—

describe the onset of an animal inferior in size, though not in courage, to the smooth-skinned, long-horned, high-crested giants of the Southern plains.

In Portugal bull-fighting is almost as much a national institution as in Spain, but with a mitigation of its brutality. The bull's horns are supposed to be padded, and the animal is not killed after the exhibition, but allowed to "live to fight another day." Still, the injuries done to horses are often fatal, in spite of the precautions taken to render the horns of the bull less dangerous, and the sufferings of the horses are the most cruel part of the performance, when this is held in the great bull-rings of the large towns.

But the entertainment is by no means confined to the principal cities. It is there that the popular heroes of the ring perform, and the skill of the banderillo and the matador is seen in perfection. But every little country town converts its *plaza* into a bull-ring at least once a year, and there the exhibition of native pluck and strength, whether of bulls or men, is seen in an even more picturesque form than among the *vaccari* of the Maremma. "First catch your bull" is the necessary preliminary to these rustic encounters; and the forests have to be scoured in order to secure suitable animals. Every one who has a horse to ride, or even a mule, delights to join in these expeditions. Armed with strong, blunt goads, they divide into two parties and scour the woods until the herds with which the old bulls are keeping company are discovered. In the great forest of the Alemtejo the bulls live a life so free and wild that for

years they are often undisputed masters of large areas in which they seldom see a human being. To separate these creatures from the herd, and drive them for miles surrounded by horsemen armed only with iron-shod poles, is a feat of skill and danger far greater than any which the South American Spaniard undertakes when armed with the bolas or the lasso. Each bull is successively enticed into pursuit of some rider, and then diverted into following a second, until it loses the herd. The whole of those thus separated are then united, and driven in a tumult of pursuit, retreat, dust, and occasional disaster into an enclosure in the town. Next day they are driven into the square, which has been fitted up as a bull-ring, and the fight begins. There is no apparatus or ordered succession of attacks, but the picadors face the bulls on foot, without the aid of the central goal, which in the old Italian *giostra* gave some shelter to the men, and they are armed with darts instead of sticks as a means of defence. When men and animals are tired out the performance ends, and the bulls, subdued by their two days' combat, are kept for use in agriculture.

According to Spanish tradition, the bull-fight in its full development, as seen in Madrid, Carthagena, Murcia, or any of the great provincial capitals, was borrowed from the Moors; with the exception that the Moors of Granada did not kill their bulls, and were too anxious to display their horsemanship to allow their steeds to be injured. There is clearly no likelihood of an institution so dear to the whole nation being abolished; but it is much to be hoped

that the humaner and more sportsmanlike customs of the Moorish bull-fight may be re-established. As a display of horsemanship, for which it was originally intended, the Spanish version of the bull-fight is a sorry spectacle. The horses are broken-down creatures, destined to be gored by the bull, and so poor in condition that they have not a chance of escape.

Yet, properly used, the horse can always hold its own against the greater strength of the bull. "The strength of the horse as compared to that of the bullock is quite astonishing," writes Charles Darwin in his description of the Pampas. "A man on horse-back, having thrown his lasso round the horns of a beast, can drag it anywhere he chooses. The animal, ploughing up the ground with outstretched legs in vain efforts to resist the force, generally dashes at full speed to one side; but the horse, immediately turning to receive the shock, stands so firmly that the bullock is almost always thrown down, and it is surprising that their necks are not broken." The struggle is, however, not one of fair strength; the horse's girth being matched against the bullock's neck. Yet even the miserable horses of the bull-ring, with their backs against the barrier, will often sustain the bull's charge, which is turned by the united weight of horse and rider bearing on the blunt spear.

The Pope has forbidden priests to attend the bull-fights, but the order has been interpreted as an injunction against appearing in clerical costume. Before going the *padre* doffs his cassock and his shovel-hat. It would be difficult totally to forbid the attendance

of clerics at a national pastime which occupies the thoughts of the ordinary public for months before and months after it has taken place. In Madrid the Plaza de Toros holds 12,000 people, and seats cost from two shillings to two pounds. A Spanish workman will live on bread and grapes or water-melon for weeks to save enough money for a front seat, and if the fatal sword be planted in the deadly spot he will fling his money, his tobacco, and his knife into the ring at the feet of the successful champion. All Seville went into mourning recently for the death of a famous toreador, and his funeral was a semi-public ceremony. A great nobleman who will keep the breed of black bulls pure enough and savage enough to satisfy the audience gains more popular applause than the owner of a Derby winner in England; and in a recent disastrous railway accident public opinion was strongly aroused against the railway company, not on account of the loss of human life, but because the bulls which were on their way to the approaching bull-fight were thrown upon the line, and besides injuring one or two passengers, which did not matter, were in some cases injured themselves, which was felt to be a public calamity.

CHAPTER XXV

MOLES AND MOLE-SKINS

THE increasing taste for furs in ladies' dress has brought mole-skin into fashion once more; and for a time it was so popular, and garments made of it were so expensive, that the skins of rabbits, squirrels, musk-rats, and any other animals whose fur could be treated and made to resemble the moles' were more than doubled in value. Except the practically extinct marten, the mole has the finest fur of any English animal; but the "little gentleman in black velvet," who was toasted by the Jacobites because William of Orange broke his collar-bone in a fall caused by a mole-hill at Hampton Court, had been almost forgotten by town dwellers until the recent change of fashion brought him so much into request. Hundreds of thousands of mole-skins must have been used in the first few years of this century, yet the little miners of our meadows do not seem to have decreased to any appreciable extent.

Mole's fur is not only beautifully fine and soft, but it is set on perpendicularly like moss without any inclination backwards. Its softness and the absence of friction thus aid the moles to pass through their burrows either backwards or forwards. The regula-

tion price for mole-skins has for years been twopence each. It is the dressing and sewing which cost money, and as English furriers have taken a hint from the Chinese work sent over by Li Hung Chang, and cut the skins to a diamond shape, the make-up is of skins covering about seven square inches.

The injury caused by moles to farmers does not amount to much, except on meadow-land if they are too numerous. Grass grows in hard-pressed soil, weeds in loose soil. As many moles will soon loosen all the surface-soil on an acre, weeds grow there and grass decreases. The good which moles do by draining land is due not to their surface operations, but to their deep burrows. These tunnels are the most permanent of animal highways in this country. They have a complete system of what may be called "trunk lines," which probably are connected up over a whole parish where there is enough meadow-land to make it worth while for the moles to work it. They keep mainly to old pastures, because it is there that the worms are most numerous, worming in ground constantly disturbed by ploughing or digging being a slow business, quickly abandoned by all but young and inexperienced moles. But where there is a line of sound meadows the moles stick to it as persistently as the Johannesburgers do to the line of the main reef, and work it both near the surface and in the deep levels with incessant industry. From the main drives they make temporary worm-hunting burrows, which merely represent their excursions in search of food. These are marked by the mole-hills. The

high-roads, being ancient excavations, are not marked by mounds, unless some obstruction has been caused.

If the lines of these highways are examined and traced, it will be found that they are carried round or under very considerable obstacles. In one case lately noticed the tunnel entered a garden from the hedge, and passed under a very ancient grass path, which is known to have been made and in existence for a hundred and fifty years. The site of the mole-run is marked by a depression some two or more inches deep, running across the path, the turf having gradually sunk there owing to successive clearances of earth by the moles from this their main tunnel to the magnificent worming grounds in the paddock and orchard beyond. This trunk-line skirts a paddock, mainly in the fence, and is then carried round an orchard. It plunges under a carriage drive, where there are at least two and a half feet of solid macadam and broken bricks, with hard-rolled gravel on the top, and emerges on the other side, where it runs round the edge of a lawn. This lawn ends in a semi-circular sunk fence of brick, and the moles have run their tunnel round, just under the edge of the bricks. They seem quite aware that they must not meddle with the lawn, and never throw up a hill there, but go on to another meadow beyond.

It is in these main burrows that the mole-catcher sets his traps. Though the animals have such ill-developed eyes that when a mole is skinned the eye will often "come off" with the skin, so small is the organ and so weakly set in the head, they are very

sensitive to light. In replacing the sod which covers the mole-trap the greatest care has to be taken to fill in any possible chinks where light might penetrate into the earth.

Either moles are very thirsty creatures, or else they find a specially good store of worms by the margin of water, for their tunnels generally have an adit to the water-level of a wet ditch or of a pond. In the very dry summer of 1899 they could be seen hunting round the edges of the water, the earth moving just above their backs. A half-grown mole captured while thus engaged was let loose in a room. He tried desperately to dig a hole in the carpet, but could not. He then scrambled to the side of the room, turned round, and dug under the edge of the carpet. Under this he disappeared, and his course could be traced as he burrowed, much to his satisfaction, between the floor and the thick Turkey fabric above him, which needed to be taken up before he could be caught. This determination and energy are characteristic of moles. They are dauntless little creatures, and almost the hardest workers in the world. They are said to take five or six hours' sleep in the middle of the day, but the rest of the twenty-four hours they seem to spend in burrowing, eating, and drinking. The desperate struggles of a mole to escape must be felt to be appreciated. If held in the hand behind its fore-legs, it will assuredly struggle out unless it is grasped so hard as to injure its ribs. Once on the ground, it instantly uses its nose as a kind of divining-rod to find a workable

spot of ground, thrusting it rapidly this way and that and trying the surface; and then, working its paws like paddles, starts its shaft at once and soon sinks out of sight.

Most accounts of the excavation of the feeding alleys from which the mole-hills are thrown up seem to assume that the method is obvious. "The earth is excavated and thrown up into hillocks." If moles worked like nearly all other burrowing creatures, this would mean that the animal entered the ground from above and threw out the earth behind it, as a rabbit does, with its hind-feet. But the mole when throwing up its hillock never comes above ground at all; neither does it throw out the earth behind it. At the same time, it cannot push a cylinder of earth in front of it, as the pith is pushed by a stick out of a length of elder. What can be seen of its methods when first sinking its burrow shows that it digs, loosens the earth, and then pushes its way through. But mere compression of loosened earth does not give space enough for the animal to pass, except when it is working only just below the surface, when it lifts the earth into a half-cylindrical arch above it. The progress of the mole below ground seems, for it cannot be watched, to be achieved as follows. It scratches away and loosens the earth in front of it *probably* to rather more than its own length, passing it backwards into the permanent highway tunnel. This gives it a certain length of run in which to work freely, and by constantly passing the earth backwards it can make a tunnel of any length

it pleases. But should it wish to turn back, it would be obliged to burrow again through this mass of loosened soil. It therefore at intervals makes a shaft upwards to the open air, and turning round, *pushes the loosened earth before it* out of the shaft. As all the earth lying farthest from the shaft has to be pushed up through the lengthened funnel of the mole-hill, this must be arduous work. But the enormous strength and resolution of the mole make light of this difficulty.

In winter and hard weather they mainly work in banks and in woods and copses. In spring, to use the phrase of the mole-catchers, they "begin to run," issuing into the fields on every side. Each mole is believed to have a rather elaborate house, which is its headquarters in winter, where it makes a bed, as described by M. Le Court, who was both a scientific naturalist and also the inventor of the modern iron mole-trap. It is said that there is a great predominance of males among moles. But it seems more probable that it is the males which are generally caught. All mole-catchers know that the females are much more difficult to trap, whereas the bulldog courage of the male moles hurries them into danger.

An English mole-catcher named Jackson, quoted by Professor Bell, stated that moles dig wells for water, sinking perpendicular shafts in which water always stands. They are also said to store worms, so bitten as to make them unable to crawl; but this seems uncertain. Their appetite is so voracious that a very short fast kills them. Male moles have been

found lying dead by the side of trapped females, the assumption being that grief and fasting have hastened their end.

Moles were distinguished by two very ancient names, by both of which they are locally known—"want" and "mouldewarp." The former is the Wessex name. "Paid for wanting Ardington Meade, 2 shillings," appears in an entry of a vicar of Lockinge made nearly two centuries ago. "Mouldewarp" is the Yorkshire name, meaning the piler up of mould. The "warplands" of the coast recall the old verb.

CHAPTER XXVI

CANARY CULTURE

CANARIES are probably the smallest of any animals habitually bred and exhibited for profit. They are also the latest in date of any domesticated creature—perhaps the only one the date of whose domestication is recorded. Yet they are so popular that at the great shows in the autumn the number exhibited often exceeds a thousand; though the extraordinary and permanent differences of colour and form acquired by these little birds since they became the household pets of Europe may be seen, perhaps, better in a small collection than in one where the specimens of each kind are numbered by scores.

The chance by which a little greenish finch, from an insignificant group of islands on the West African trade-route, has been adopted as the pet cage-bird of every European nation, is one of the accidents of domestication. Neither the plumage nor the song of the canary in its wild state are such as to mark it out specially for selection as a pet; though, as compared with the tropical birds met farther south along the West African coast, its linnets-like song is an echo of the bird-voices of the gardens of Europe. The Portuguese and Spanish sailors, in their first ad-

venturous voyages, were keenly on the watch to discover in the new countries some familiar bird or flower, and Columbus's journals are dotted with entries of the song of "river sparrows" and "finches," "like those we hear in Spain." Italian voyagers are credited with being the first to bring the canary-birds to Europe. They are said to have been brought over early in the sixteenth century as part of the cargo of a vessel bound for Leghorn. The ship was wrecked, and many of the birds were released and flew to the nearest land, which happened to be the island of Elba. There they found a climate so like that of their native land that they nested, and would have become naturalised. But the greater number were recaptured, and sold in the coast towns of Western Italy. There the tame canary was first established; and it is said that its portrait may be found introduced into more than one of the works of old Italian painters, depicted in the sober colours in which it first made its appearance in the peninsula. The peculiar beauty of the plumage was the soft merging of the green on the back into a beautiful warm grey beneath, a tint which may still be found in the "mules," and which seems to reappear in the "cinnamon" and "lizard" canaries.

The splendid bright yellow of the modern birds was gained by carefully mating all those in which the yellow colour showed most conspicuously. But there are equally beautiful varieties which are neither green nor yellow, and yet have been established for nearly two centuries. To a naturalist the permanence of the

variations should be almost as interesting as the permanence of type. The "lizard" canaries, for example, are spangled all over the breast, back, and shoulders with elegant spots of silver or golden tints. The "cinnamons" are of a most beautiful mixed tint of orange and mealy grey. Norwich canaries without crests are a brilliant yellow. Others are yellow or buff, with crests as regular as a crop of hair cut round the rim of a barber's basin.

Most of the best known breeds of the present time existed as early as the end of the seventeenth century; for Mr. G. Barnesby, in his work on the canary, mentions a book published in 1709 in which twenty-eight varieties are mentioned, comprising nearly all those known at the present day.

When perfection of form has been attained, perfection of colour becomes the object of the canary exhibitor. Some of the little birds appear in orange plumage, which exceeds in depth and richness the colours of the orioles or tropical tanagers. "Buff" is the name by which this tint is known to "the fancy," who, like most specialists, attach a different set of meanings to words in common use when applied to the mysteries of their craft. The means by which this beautiful tint is conveyed to the plumage of a pale, almost primrose-yellow, bird like the "Norwich plain" canary is so mechanical that if it were not for the part played by Nature in transferring pigment from food to feathers, it would deserve classing with the manufacture of green carnations and blue roses by steeping the stems in dyed liquids.

When about nine or ten weeks old, the young bird moults its first feathers completely, and acquires the plumage of adult canaryhood. At this period the owner devotes all the cosmetic experience acquired in a thousand generations of canary-colouring to artificially darkening and enriching the tint of the new feathers. Probably there is no other creature in the world, not excluding the beauties of the East, which goes so thoroughly into training to gain a complexion; for the moult lasts for a couple of months, and during the whole time the cosmetic process is never neglected. It consists entirely in feeding the bird on food containing yellow colouring matter, mainly from natural vegetable dyes. The first step is to induce it to eat the flowers of marigolds. Canaries, like most other finches, are fond of pulling to pieces and eating the petals of flowers, and there is seldom much difficulty in teaching them to eat the brilliant blossoms. No morsel of green leaves is allowed in the cage, but fresh marigolds are given as long as they will touch them, the ardent "fancier" being recommended to grow the flowers in relays in his garden. Saffron-cake and saffron-water form the solid and liquid accompaniments of the marigold flowers, to which cayenne-pepper is sometimes added. This gives an almost scarlet shade to some of the feathers, but sometimes injures the health of the bird. But saffron seems perfectly harmless, and the canary eats and drinks the yellow-dyed food as gaily as the sparrows steal the saffron fibres from the crocuses themselves in the early spring. Various patent colour-

ings are also used, and are exhibited in front of the birds which have thrived on them like Mellin's food and Nestlé's milk at a show of prize babies. Cochineal water is perhaps the deepest in tint of any food given, but this does not impart the characteristic red which it produces as a dye.

As the shades of orange and yellow suffer from dust and dirt, canaries are most carefully bathed before exhibition. A shaving-brush, warm water, and soft soap are the usual means employed; and a practical hand will wash canaries by the dozen, at the rate of seven or eight minutes each, transferring each bird after its final douche and rubbing with a soft cloth into the drying-cage, which stands before the fire. Precision and "boldness of attack" are the qualities for a successful washer; canaries, like babies, being apt to catch cold and become miserable if the process be unduly prolonged.

Singing canaries are treated on different principles. Their qualities are more suited for private appreciation than for exhibition, or contests like those held by the London bird-fanciers between cock chaffinches, in which the bird wins which repeats its song the greatest number of times. Yet it is by its song, rather than its plumage, that the domesticated canary can rightly claim to be almost the best, as it is the most popular, of cage-birds. The Norwich and Yorkshire breeds are said to be the best songsters among the English varieties, *if well taught*. But neither of these are equal to the German birds, which, perhaps from living among a naturally musical race, have a correctness of

ear and a memory of sound unrivalled by any other species of canary, or indeed by any bird at all. It is said that some German canaries have known and habitually reproduced the complete song of twenty-two other species of bird, including the nightingale, the skylark, the goldfinch, the woodlark, and the linnet. These German birds seldom live long in this country, but are bought at high prices to put among young canaries, to whom they act as tutors, singing, like Orpheus, till they die. Sometimes in the ecstasy of song these birds actually cause their own deaths—bursting a blood-vessel by the extraordinary effort to compass some loud or unusual note.

It would be interesting to know whether the English canary is so completely domesticated as to have lost the power of returning to the wild life, and of rearing its young in sufficient numbers to make the experiment of reversion to the original form possible. Those that escape from cages do not seem happy in their freedom, even if the scene of their wanderings be English country gardens in summer-time. Probably the winter would be too severe for them to survive in this country. But the result of releasing a few dozen cheap yellow canaries in their own islands would be worth observing by those European residents who now make the islands not only a winter resort but a permanent home.

CHAPTER XXVII

HUMOURS OF THE "FANCY"

THE honorary secretary of the National Mouse Club was recently presented with £8 in subscriptions as a mark of appreciation of his work for this club. The journal which gives this item of news is not an "extreme" fancier's organ, but a very humane one. Even the remedies for some ailments of pugs are advertised with the attractive heading of "No Starving." It also records some interesting details of how the mouse classes are doing at shows.

It appears that in the Midlands a district Fur and Feather Society's annual show was remarkable for the quality of these classes. "A very pretty Dutch mouse won, and its owner took a V.H.C. [very highly commended] with a lovely white one." Another well-known exhibitor "sent a very fat fawn one, but his fur was not in very good condition." A sable mouse, with the best of ears, was third; and a lovely black-and-tan, catalogued at £20, was second. The writer does not know the points of a mouse, though £20 is a price calculated to make beginners envious. But this pitch of excellence is not obtained without intense thought and expenditure of energy, as plainly appears from the regrets expressed that one well-known

exhibitor, "who never failed to take leading honours wherever she showed," has given it up because she has married.

It would be wrong to laugh at the National Mouse Club, because it leads to higher things. It is difficult to draw the line at which the fancier ends and the stock-breeder begins. In the preliminary remarks printed and circulated before a sale of one of the premier herds of pedigree cattle in this county, the auctioneer noted that the owner "had been marked out early for distinction. A natural taste from boyhood for live-stock, first with canaries, later with rabbits, and then with Langshan poultry, with all of which champion prizes and challenge cups were won, led him to extend his taste," with results of the happiest kind, and the creation of a transatlantic reputation. The parallel of Dandie Dinmont's terriers occurs, they being entered first to "stots and rottens, then to tods and brocks."

The chief difference between the "fancy" and the stock-breeders is the vivacity and vigour with which the devotees of the former differ on the subjects most dear to them. Their surplus energy is immense, and their loyalty to their leaders unstinted. The tributes paid, in works devoted to their special animals, to the organisers or founders of the fancy are of the floridly generous but perfectly sincere order. The personal sacrifices, unremitting single-minded zeal, unswerving devotion, and singular rectitude of these pioneers and pilots are dwelt upon in pages of heartfelt laudation. Their portraits

embellish the text; and there can be no doubt, from the expression of their countenances, that they are the kind of leaders who never swerve from the stern path of duty. What that duty is, and the trials which beset them by the way, every fancier knows too well.

Fancies are like other cults. For a time they are pursued with a single mind. Then divisions arise, because different and conflicting ideals grow up insensibly, not from any suggestion of the fanciers, but from the nature of things. Some one has a rabbit or a pigeon or a guinea-pig showing marked features differing from the true type, yet so excellent in themselves that he cannot set the animal aside. In time he begins to prize these very differences, and then he gathers his friends, who perhaps have animals like it, and starts a schism.

Now, in the heavy lines of genuine stock-breeding, such as shorthorns, or Southdowns, or Shire horses, or Tamworth pigs, every one is so absolutely convinced that he is right and every one else wrong that he treats suggestions of change with contempt. In the "fancy" matters are different, or, rather, when the parties differ the dissidence is very marked, and embodied not only in correspondence, but in the permanent pages of the organs devoted to the fancy. On the Turf there are scandals; in agriculture, questions. In the fancy there are "rows." These rows are generally epoch-making, as they lead to the creation of two lines of some breed instead of one; so perhaps on the whole they are beneficial. Every one hurls himself into the fray and does his level

best, and no one who observes these dissensions with a proper sense of what they may lead to fails to remember them. There was the great Black-and-Tan Row, which may serve as a specimen. It was some years ago, probably ten, so feeling has cooled. Some one had the great good fortune to find a "sport" among various kinds of rabbits turned out to run wild, which was like a wild rabbit, but was coloured black-and-tan. This was promptly domesticated, and a new and desirable breed, just like wild rabbits, only black-and-tan, was founded.

All their points were maintained, even "the wild expression of the eye." But people could not let them alone, and began to exhibit black-and-tans with lop-ears and so forth, degrading them to mere hutch-rabbits. The grand old original black-and-tans were threatened with extinction or degradation, and it was feared that all the wild character would be lost. These are the moments which prove the true leaders of the fancy. Then comes the trial of character and constancy, which wins the devotion of loyal followers. In this case the leaders, if the writer's recollection serves, went opposite ways, and there were for a time two black-and-tan clubs, the members of which were not on speaking terms.

Then there was the great Grit Row, and another, too bitter and too dreadful to name, in connection with a certain breed of chickens. The great Grit Row originated spontaneously. Some one had very superior chickens, which won endless prizes, which he accounted for by the fact that he gave them

“grit,” which he pounded up himself. The grit idea “caught on,” as they say. Very many people thought grit was the thing. They almost fed their chickens on grit. They had it in sizes, and put saucers of small grit about as large as gunpowder before callow chickens, and of large grit as big as maize for grown-up cocks and hens. All the fowls acquired a taste for grit, even if they had it not already. Then an opposition arose who hardly let their chickens look at grit. One leader and breeder of prize-winners wrote to say that his lived on bare boards, where there was no possibility of picking up grit, and so forth, and insinuated the darkest motives as against the advocates of the grit, who sold no end of it at a very handsome rate, considering the abundance of the article in nature. It was about twice as dear as the best oilcake.

Of the terrible division which recently arose in poultry circles brief mention only can be made. A fancier discovered a new breed of chickens of the useful kind. Now, it is well known that any one who discovers a new chicken expects by its means to benefit mankind and solve the cottage problem and the rural emigration question. Conceive, then, the feelings of a fancier who sees a chicken which might and ought to do this being turned into a “show” variety, and the judges lending themselves to this course. Making a chicken or pigeon into a “show” bird means that if it has long legs you make them longer, while if it has short legs you make them almost disappear, or some such treatment, without

caring in the least whether it will be useful or able to lay eggs or good to eat. Where, then, is the solution of the cottage problem and the benefit to humanity? Gone for ever. There were many and bitter protests, and the result was a third kind of chicken of a highly useful character.

But the fanciers do excellent work in providing amusement, and even profit, for numbers of people who would otherwise have no scope for surplus energy. They create a demand for other people to supply. When prize Belgian hares are sold for £60, and even larger sums, and guinea-pigs for £20, to go to America and the Colonies, while breeding prize pigeons and canaries has become a national industry, it is difficult to foresee the future limits of the fancy. We imagine that fish or iguanas may eventually find a place beside the birds and rabbits, the cavies and the mice. To suggest new objects for clubs and associations to raise to the dignity of a "class" in shows, and later to have shows all to themselves, is one of the dreams of good fanciers. Generally the animals taken up are in some way neglected breeds, or poor relations of others which have either reached perfection or have been so spoiled by "over showing" that they are no longer admired, and show their unfitness for survival by failing to survive at all. Most people who are not in the fancy think that carrier pigeons are pigeons which can carry messages. But carrier pigeons had wattles, and these were so developed by the show breeders that at last they needed to have their

eyes opened for them every morning, because the wattles shut them up. Then the pigeons which had not been patronised, and could fly with messages, were called "homers," and not carriers. These were then bred for shows, and became perfectly useless; so now they are called "show" homers, and those which can fly are "flying" homers, about as distinctive a title, one would say, as walking postmen. Other "very high-class fancy" are bred with such short beaks that they cannot feed their own young ones and always need nurse pigeons to bring them up.

Thus there is no fear that the fancy will ever be quite stationary, as it kills off its own protégés. Even the dogs, or some of the breeds, may come to a bad end at their hands. An American man of science was recently on a visit to England for the purpose of studying teeth, because he has long heard it imputed against his countrymen and countrywomen that they lose theirs abnormally soon. Almost the first discovery he made was that the modern British prize bulldog has such ridiculous front teeth that he cannot bite properly, and if he did the teeth would be squeezed out.

CHAPTER XXVIII

THE FEAR OF MAN

IN a previous volume, "Animals of To-day," some account was given of the evidence collected by ancient and modern naturalists, from Don Felix d'Azara to Mr. Hudson, that the puma, the second largest of the big cats of South America, neither feared man nor regarded human beings as its prey, but on the contrary sought their society, and even protected man from the attacks of the jaguar. Trustworthy facts which lend additional confirmation to this interesting question must necessarily be slowly acquired; but the following anecdote, which comes at first hand from one long resident in British Guiana, supports the belief that the puma seeks the society of man instead of attacking or fearing him. When making an expedition up one of the large rivers in a steam-launch, our friend gave a passage to an elderly Cornish miner who was anxious to reach the goldfields. Not wishing to intrude upon his hosts, he did not sleep on board the launch, but always slung his hammock between two trees on shore. As climbing into a high-slung hammock is not easy, he usually fastened it rather low, and his weight probably brought it to within three feet of the ground at the bottom of the curve. One morning, being asked

how he had slept, he complained that "the frogs had made such a noise underneath his hammock that they had kept him awake." Some Indians of the crew who were folding up the hammock laughed a good deal when they heard this, and being asked the reason, said, still laughing, "Oh, 'tiger' sleep with old man last night." They had found under the hammock the marks of where a puma had lain. The noise which had kept the occupier of the hammock awake was probably the purring of the puma, pleased at occupying the "next berth" below a man. As these Guiana Indians have, in addition to the unerring eye of the forest-dweller, a special liking and capacity for taming animals, it can hardly be doubted that their conclusion was correct. Such an absence of fear, and liking for human society, could only be paralleled by the behaviour of some domestic cats. Yet in the case of the puma it can only be a survival of a primitive disposition, which has already been lost in a great measure by the same species in North America.

Are we, then, to suppose that the absence of that fear of man so general among even the large carnivora was the rule in the primitive world? If it was, we shall have to account for the survival of man in the presence of creatures which did not fear him, and possessed a far more effective physical equipment for attack than man possessed for defence; for we cannot suppose that the benevolent neutrality which can safely be attributed to the puma was exhibited by the other carnivora. The evidence that fear is not the natural attitude of animals towards man is mainly of two

kinds—the notes of explorers who have pushed into the few regions of earth where animals were numerous but man had not trodden, and the results of the very latest experiments of to-day in districts where the killing of animals has been absolutely prohibited. In other words, we must compare the behaviour of the creatures in the Arctic seas in the days of Willoughby and Barents, or in the voyage of Weddell to the Antarctic, with the latest reports from Yellowstone Park. The results show a striking agreement in the demeanour of the beasts when first confronted with the new creature, man. Few of them exhibited fear, so far as the records show. When Barents's crew were on their first voyage a polar bear, who probably had never seen men before, took one of the crew who was lying down by the back of the neck, and after dragging him some way, bit the top of his head off. Even now the polar bear is the least shy of his race, though so constantly hunted.

The general tendency of wild animals kept in large reserves and never molested points to the same conclusion, though for obvious reasons none of the most dangerous carnivora can be maintained in such places. The fear of man is lost, by creatures wild and free but unmolested, so quickly as to be matter of surprise to those most conversant with animals in captivity. Reports published in the United States newspapers dwell repeatedly on the loss of the fear of man by all animals in Yellowstone Park, where the deer (both wapiti and black-tailed deer) come to the houses to be fed, and even eat the flowers from the window-boxes.

Brown bears hang round the hotels, and come daily to eat the refuse carted into the woods close by, and many of the smaller rodents are absolutely fearless.

In menageries and zoological gardens the fear of man is lost mainly by constant and daily contact, with no power to escape, and by the remembrance that it is man who provides their food. But here the conditions are abnormal, and it would be useless to draw conclusions from the behaviour towards man of animals in captivity, and apply them to the solution of the earlier problem of the innate or acquired character of their fear of human beings. It is, however, matter of general knowledge that where man is weak and beasts strong and numerous, as in the country watered by the Zambesi and Shiré rivers, the boldness of the animals leads to serious disasters. In the present day the only frequent reports of attacks of lions and leopards on men for food, and not in self-defence or fright, come from these districts, though the story is as old as the rebuilding of Samaria.

African lions are, beyond question, the boldest of all predatory animals, and those of Mashonaland and Uganda are perhaps the boldest of all. During the night, their natural hunting-time, they attack draught animals, or even men, within a few yards of the camp-fires, and are a constant and serious danger to travellers in districts remote from the main tracks of traders. From the Zambesi, through Mashonaland, and south to the Limpopo, a chorus of complaints rises in the pages of recent travellers, whose cattle or followers have suffered from their attacks. Mr. Selous

has recorded the pursuit of the post from Salisbury by a lion and the loss of the mail-bags, which the animal tore from the back of the pack-horse.

Mr. Millais, who crossed the Nuanetsi River with a team of eight donkeys to draw his waggon—the oxen being left behind on account of the proximity of the “fly” country—lost three in one night by a lion attack, carried out with the utmost contempt for human beings, whether white or black. He was awakened by the lion’s roar, and almost immediately saw one of the tethered donkeys knocked over. It was not five yards from the fire, but in the darkness and dazzle of the fire he could not see the attacker. “We knew instinctively that a lion had killed the donkey, and was standing over him not five yards from where we were, but it was hopeless to fire unless we saw something, or at least could make certain of his whereabouts.” This odd scene continued for some moments; the actors being four or five black men, two white men, a pony, seven live donkeys and a dead one, and the lion standing over the latter, with a fire partly lighting up the figures, until a couple more donkeys broke loose. They rushed into a mealie-field, and there the party heard the lion chasing first one donkey and then another, as excited and as little afraid as a dog chasing rabbits in a field of barley. “At every bound the lion emitted a subdued ‘boo-uff’ as his forelegs struck the ground, but the two did not go far. There was presently a loud scuffle, a crack, and the sound of a heavy body falling; then all was still.” The lion chased the third donkey

round the camp, killed and ate it, and was next day shot by an ingenious trap, made by tying a rifle to posts, and fastening a string to the trigger, which the lion struck when revisiting its "kill." The un-sportsmanlike method of compassing its death is excused by Captain Millais on the obvious ground of necessity. This lion was ten feet long from the tip of the nose to the tip of the tail, was in perfect health, and immensely formidable. But besides the "waggon and kraal business," which occupied it at the time of its last attack, it had taken to killing native women when game and native goats were scarce and travelling teams had not yet come up-country. Six women had been killed by it from one village.

If, as seems probable, the animal fear of man was acquired and is not natural to their minds, it is not very clear how the early tribes of men, when the larger carnivorous animals were far more numerous than now, escaped destruction and survived long enough to impress on the animal world the sense of fear by which man now dominates it. Regarded merely as a conflict between one class of animal and another, the result should not have been doubtful. Man ought to have disappeared from the face of the earth, or, in any case, to have retreated to remote strongholds in regions not frequented by the beasts. That he did not do so, but turned the tables on the better equipped offensive creatures, is fair presumptive evidence that original man never was on a level with the animals in intelligence, but was equipped with the predominant

brain-power which has put him ahead in the race ever since.

Primitive man, literally speaking, "lived by his wits," for he could have owed his survival to little else. He was not, for example, nearly so well equipped as the monkeys for physical defence or flight, though their survival is not altogether easy to explain on purely physical grounds. Their power of using their arms and hands as a means of swinging rapidly from branch to branch gives them an advantage over all the tree-climbing cats. Their habit of throwing missiles is also very disconcerting to other animals; though this art is only practised by certain monkeys, and may even have been acquired in imitation of man. But their rapid and intelligent combination for defence, menace, and look-out duty has contributed quite as much to their survival as their speed and activity. In tropical America even the monkeys are hard put to it to escape the attacks of such active and formidable foes as the harpy eagle and the ocelot. But it cannot be proved that even the most debased or physically weakest of mankind has ever been the "natural prey" of that "natural enemy" which, according to Sir Samuel Baker, is the nightmare of nearly every species of non-carnivorous animal.

The causes which make exceptions to this rule are temporary and narrowly local. Even the Greenlander and the Esquimau are the masters of the polar bear, and probably always have been, though little better armed than primitive man; and the pigmies of the Central

African forests are mighty hunters. It may even be that the neighbourhood of fierce animals aided the early development of man; for the least developed races are largely found in such places as Tierra del Fuego, where, in the absence of savage beasts, savage man had no inducement to arm and equip himself.

But man has had an even more potent ally than his own ingenuity which from remote antiquity has invested him in the mind of the animal world with something of the *supernatural*. He, and he alone, is ever accompanied by the one element which the animal mind cannot create, cannot understand, lives in constant awe of, and dreads by night, when its courage is greatest and that of man least steady. Fire—that pillar of cloud and flame which precedes not the aggregate human host, but the smallest fragment of the invading army, the constant and dreaded harbinger of human presence, springing up, as the beasts must think, automatically from the earth wherever man rests his body, guarding him in sleeping and waking, and always associated with his abode—this, above all his attributes, has for ages terrified and subdued the beasts.

Since the first appearance of man in any given region of the earth he has been teaching the beast to fear him; and it is not until to-day, when he is absolutely their master, and has in many instances totally destroyed them, that he thinks of restoring on a tiny scale, and on a few spots on the earth's surface, the "state of Nature;" and allowing those creatures which he dares to experiment with, once more to lay aside that acquired terror which makes them flee his presence.

CHAPTER XXIX

POLYGLOT ANIMALS

A RECENT discussion on the use of Welsh in working sheep-dogs is abundant proof that the revival of the Celtic tongues, recently advocated, will meet with no resistance from the canine population of Wales. They have many of them been brought up to understand Welsh from whatever corresponds to the cradle in a canine nursery. On the confines of the Highlands the dogs often understand both Gaelic and English. But these polyglot collies are not very common, and the greater part of the orders given to them, except such ordinary phrases as "Go home!" "Lie down!" or "Come here!" are usually conveyed in the tongue of the Gael.

Ever since the dog became the servant of man he has also had to be a linguist. If the annals of dogs and men were searched, it would be found that the former had in their day been proficient in the understanding of tongues dead for centuries, as they will be in the future of the languages of nations yet unborn. "Argo" doubtless obeyed the orders given by Penelope in the most ladylike Ionic of the day; the dog of Alcibiades was no less proficient when addressed in "up-to-date" Attic by the club porter in Athens; and

we may be very certain that all the dogs on the canvases of Cuyp and Teniers were equally familiar with the dog language of double Dutch.

“Don’t say that before ‘Snap.’ ‘Snap’ don’t know he’s only a dog. He thinks he’s folks!” was an American appreciation of the quickness with which dogs understand and resent anything rude said about themselves. The degree to which they comprehend doubtless differs, and is probably in most cases limited to the perception that their name is associated with laughter or a censorious tone of voice when mentioned to others. Also the *range* of conversation, and of activities to which it refers, is so large in the average gentleman’s house that a dog often gives up the effort at understanding more than actually concerns its daily comfort. It becomes bored by the demands on its attention—the more so as it has as a rule nothing to do to keep it busy. But any one who has spent any time, let us say, in fishing quarters in a Northern farmer’s house, cannot fail to notice how simple and few are the items which make up the routine of the day, and how completely the dog—there is always a dog, and that a collie—understands all that is going on, and probably most of what is said. These farmers are a very silent people as a rule, speaking seldom, and then only about practical matters. When happy and comfortable their practice is to sit quiet, not to talk. So the dog takes very special notice when a remark is made, knowing that it is usually connected with the *doing* of something by other people or by itself. It is quite used to being told to “mind the baby” or to

“stay ben the house” while the wife goes out, and it knows exactly and to the minute what every person and every animal about the little farm will be doing at any given time. It is thus that it also learns to understand talk which refers to these objects of interest. St. John, in his “Wild Sports of the Highlands,” says: “The dog that lives with his master constantly, sleeping before his fire instead of in the kennel, and seeing and hearing all that passes, learns, if at all quick-witted, to understand not only the meaning of what he sees going on, but also frequently, in the most wonderful manner, of what is being talked of.”

The most curious example of a (probably) polyglot dog's understanding of conversation was shown him by a shepherd. Like the dogs of modern Greece, which keep watch along the little banks that enclose their masters' barley fields, the sheep-dogs “watch their masters' small crop of oats with great fidelity and keenness, keeping off all intruders in the shape of cattle, sheep, and horses. A shepherd once, to prove the value of his dog, which was lying before the fire in the house where we were talking, said to me in the middle of a sentence concerning something else, ‘I'm thinking, sir, the cow is in the potatoes.’ The dog, which appeared to be asleep, immediately jumped up, and leaping through the open window, scrambled up the turf roof of the house, where he could see the potato field. He then, not seeing the cow, ran and looked into the byre, where she was, and finding that all was right, came back to the house.” The shepherd said the same thing again, when the dog once more

made its patrol. But on the doubt being uttered a third time, it got up, looked at its master, and when he laughed, growled and curled up again by the fire.

The writer had an old setter which lived in the country, but always knew when his master was coming back from town. He slept in the stable, and probably heard the order given for the dogcart to be sent to the station to meet his master; for there was no other preparation for his coming that the dog could have been aware of, yet "Plato" was always to be found waiting at the front door when he arrived.

It is greatly to the credit of canine intelligence that dogs soon learn to understand not only orders given in any pure language, but also those given in debased or mixed languages. Is this, perhaps, the origin of the phrase "dog Latin"? The dog-teams used when the Klondike was first discovered were worked in a kind of "pidgin French," a mixture of old Canadian-French, English, and Indian. The order to start was "Macharn!" which all the trained dogs understood. This the English miners turned into "March on!" Its origin, and the form in which the first sledge-dogs had heard it, was "Marche, chien!" Probably most English hounds were addressed in a bastard Norman-French long after the language was entirely dropped in speaking to persons. It is just possible that the familiar "*War* hare!" and "*Eloo* in!" are the remains of the ancient foreign hunting terms.

Where collies are being "worked" on the hills of the North by their masters, the latter as a rule address them in a series of shrieks, not shouts, which are abso-

lutely unintelligible to any human listener whatever, so that the interchange of orders and the understanding of them are much more in the nature of signals than of language. But that is a matter of use and wont. Probably these dogs begin by learning to obey orders given in the natural voice, round the cottage or homestead. They inherit the capacity for understanding what they are wanted to do in an unusual degree, as well as the natural inclination to act as the servants of man in a particular way. They have a positive eagerness to learn and to be employed. "We ask for employment and they give us *work!*" says a disgusted British working-man in an amusing musical comedy recently performed. The Northern collie eagerly desires employment of any kind—even work.

But there are districts where work is scarce for collies, because the "labour market" is overstocked. In parts of Cumberland, for instance, away from the mountains and fells where the dogs are busy every day looking after sheep, there are large areas where the farms are small, and there are no "sheep gates" or big mountain pastures at all. But the tradition of owning sheep survives, and even if there are no sheep it is *infra dig.* not to have a sheep-dog. The traditional form of property was cattle or sheep, and the presence of a dog is a token that there is property to look after, to fetch to the fold or the milking-shed, or to drive to market. The result is that to every mile of road there are about ten yellow collies, most of which belong to the ranks of the unemployed for the greater part of the day. To fill in part of their time they sit

on the stone walls contemplating the passers-by, and hoping against hope that a stray animal may come past which they can aid in rounding up. But their ingenuity in finding "jobs" about the house is great. Besides fetching the two or three cows, perhaps from the adjacent meadow, about which they make a maximum of fuss and barking, they fetch the chickens to be fed, bring the ducks up from the river, see the horses back from plough, and often go to the school, perhaps a couple of miles off, and fetch the children home.

Dogs kept much in the owners' company do not necessarily learn to understand the meaning of words. That depends on the alertness and interest of both the animal and its owner. But they *can* be made to understand much if treated in a way which appeals to them. For example, an eager little dog, brought into the house on the understanding that it is going out for a walk, and quite disconsolate at seeing its mistress going upstairs as though she were giving up the idea of a walk, will run gaily upstairs if the latter says, "I am going to put my *hat* on," emphasising the remark by pointing to her head. Nearly all dogs know what "going to church" means—namely, that they must not come. It is the opposite and contrary of "going for a walk."

Mr. Bartlett the elder, the first Superintendent of the "Zoo," held that however attentive to his duties a keeper might be, he was never successful if he did not *talk* to his animals; and there can be little doubt that even if they fail to understand most of the conversation, the mere fact of being talked to creates

a certain degree of sympathy between themselves and their keepers. If comparatively few words convey any meaning to most animals, the *tones* of the human voice are almost certainly as intelligible to them as many animal sounds are to us. The purring of a cat could scarcely be mistaken for an expression of anything but pleasure by a person quite unacquainted with the species or its voice, and the anxious notes of many birds when calling their young are so expressive that a sympathetic listener can easily interpret their meaning. Last summer a friend of the writer's picked up a newly hatched water-hen which had somehow been separated from the rest of its family and wandered a considerable distance from the lake-side where it had been hatched. The rescuer was anxious to return it to its mother without delay, but no trace of the nest or old bird could then be discovered. So the chick, which was weak with cold and hunger, was carried up to the house and fed with raw egg, which it sucked off the tip of a paint-brush with evident satisfaction. A couple of hours later, when it was taken down to the lake again, a bird was heard calling in the rushes. The sound was unfamiliar, and quite unlike the ordinary call of a moorhen; there were also several other species of water-fowl nesting on the lake to which it might have been attributed. But the note was so unmistakably that of a *distressed* mother-bird calling its young that the identity of the caller was at once suspected. It was carefully "stalked," and proved, as we had supposed, to be the mother moorhen; so

the tiny chick was launched on to the lake, and in a few minutes had rejoined its family.

It is difficult to guess how far animals of different species understand one another's voices; probably they only learn to interpret the language of their natural enemies or natural prey, for few animals concern themselves with anything that does not affect them personally. But dogs, which express themselves more by gesture than by sound, apparently learn to understand something of the language of whatever race of men they are associated with, and can learn to converse to some extent with horses, cattle, sheep, cats, and some birds. This is certainly not because there is any common language between them. For Professor Garner, who devoted several years to the study of monkey language, found that even among different species of these there was no common code, or monkey "Esperanto"; and a very careful study of the creatures which he kept in captivity in their native country proved that such sounds as the different species utter are very limited in number, and do not express more ideas than other and better known animals convey to each other by the voice. The chimpanzee, for instance, has distinct sounds for the ideas of food, recognition, fear, affection, warning, and discomfort, and two gestures of negation—a movement of the arm away from the body and towards the person addressed, and that of turning its back and moving the arm backwards. Other apes have a more limited vocabulary, and though their intelligence is of a very high order, their means of

communication, except perhaps by gesture, are not greater than those of many other quadrupeds, notably the cat, and less than those of certain birds.

Touch, especially in the case of insects, and the highly developed power of scent, appealing to the senses by channels unknown to man, and interpreted by a process of thought with which we are only partly acquainted, convey ideas by other means than speech, and supplement the want of language. The silence of most quadrupeds is accounted for by the limited number of wants encountered in their daily life, and the constant recurrence of these wants in the same order. Many of their ideas need no expressing. They simply act on them at once or after a little reflection, and their companions follow suit.

Brain-power has no necessary result in efforts at oral communication. The elephant exerts all its persuasion on another elephant by touches with the trunk, without uttering a sound, while the howling monkeys, not the most intelligent of their race, are the most vociferous. Tigers and cats express themselves by the voice far more distinctly than the chimpanzee. A particularly tame tiger cub at the London Zoological Gardens purred to show pleasure, mewed in recognition of its keeper, uttered another and different sound at the sight of food, and possessed a vocabulary of modulated howls and groans quite as expressive as the "calls" of a cat; while the fox, one of the cleverest of our wild animals, is almost mute, though the fox which twice travelled back from Sussex to its home in Northumberland

must, unless we suppose the existence of another sense, have had some means of asking the way from other foxes which it met on its journey.

Birds are in general as talkative as quadrupeds are silent. They are not only vocal, enjoying the sound of their own voices, and often listening with delight to the song of their mates, but they talk in the proper sense of the word. They *prefer* to use their voices as a means of communicating their wishes or ideas. They are able to modulate their voices better than most quadrupeds, though this rule has many exceptions. But this does not explain their preference for "talking" in place of signalling or the use of touch. It is a racial instinct, quite as characteristic of the order *aves* as the possession of feathers or the power of flight.

Two features in the "talking" of birds will occur to every one. There is no universal bird-language, or even a language common to two species, though certain sounds of warning, when uttered by one species, are understood by another. Secondly, the talking faculty is very capriciously distributed, even among birds which are otherwise physically and mentally very much alike. The crows, which easily learn to imitate human speech, have very few notes or calls of their own. The jay has only one, a harsh screech, modified when it is pleased into a croak; and a chuckle, varied by a squeak, is the whole natural vocabulary of the magpie. Yet the piping-crow and the nutcracker-crow are songsters of a rather high order, and the former has an infinite variety of "words" and calls.

The absence of any universal bird-speech is seen most clearly by any one who observes their habits in places where such a common language would naturally be expected. On the shores of some estuaries, or of the North Norfolk coast, it is possible to see from a thousand to perhaps three thousand birds, closely united in race, and living all day in sight of one another, associating in flocks, with common feeding-grounds and common dangers—a “community” of plovers, knots, ring-dotterels, stints, curlews, sandpipers, and other kindred species. Their interchange of ideas by means of the voice is very limited, and a common code might easily be learnt. They require a call-note of inquiry—“Where are you?”—another for answer, sometimes the same note—“Here I am”—an alarm-note, and a note uttered when flying or rising from the ground, which may be interpreted as a sound of mutual encouragement or pleasure. Not a trace of a common code appears. Each kind has its own call, its own answer, and its own fighting note. Their many and various musical whistles make one of the charms of the winter shore; but they show the curious sectionalism of bird-language. The ease with which they might adopt a common tongue is evident from the fact that many coast-men learn some, and a few of great natural ability as fowlers learn *all*, of these calls. As in Heligoland, where the islanders “whistle down” passing birds from the sky, so on the Norfolk coast there are men who can “call down” a single golden plover, a stint, or even a curlew. One of the most

extraordinary instances ever known, both of the man's skill and of the bird's intense and unsuspecting reliance on language, occurred not long ago on the Norfolk coast, where a noted "caller" brought a golden plover down from a great height in the sky, and kept it running about within a few yards of a party lunching in the sand-hills. In this fowler's opinion, the peewit, which has the largest range of notes of all shore-birds, and therefore is presumably the cleverest at distinguishing the meaning and differences of the peewit language, is also the most difficult to "call."

Most, if not all, of the songs of birds are meant as *music*, to appeal to the emotions, and not as a means of communication. Their "talk" is separate from their song; though the English robin, perhaps the only wild bird which habitually "converses" with mankind, seems to combine the two to some extent. None of the game-birds or of the gallinaceous birds, wild or tame, have a song; but the greater number communicate with each other vocally. Among fowls the sound meaning "Here is something nice to eat" is used by both sexes; and these are the only birds which have a distinct and universally recognised call with this meaning. Charles Kingsley, only half in earnest, ascribes a similar call to the hen-grouse; but pheasants have only one note when calling their young, which is used indifferently on all occasions. Partridges "cluck" to call their chicks as a hen does, but lack the "food" word. Chickens also have a distinct and peculiar call which means "a hawk." Hawks are now so scarce near

hen-roosts that they might well have forgotten its use and meaning, but they have not. The owner of a model farm, who had noticed the use of this call when a boy in a county where these visits from hawks were not uncommon, and who was a good mimic of bird sounds, tried the effect of uttering it when some fifty or sixty fowls were feeding in a meadow connected with their hen-house by a tunnel running under a fence. At the first call they all looked up, and at the second, though they saw no hawk, they ran to the tunnel and crowded through it into the hen-house. Most of the combined movements of the grey partridge, when no enemy is near, are agreed on by means of conversation. They "call" to each other when disposed to take a flight, and have a separate note to indicate that they have taken wing, a word well understood by any of the covey which have not joined the rest, and by other coveys near. When the brood is settling down to sleep the old birds "cluck" to gather the brood, even when they are full-grown.

In the sustained flight of birds in flocks the use of the voice is discarded, and "flight evolutions" are made by signal. This is analogous to the use of signals to govern the movements of ships in fleets. It is not only more convenient, but more effective than a vocal order. The signal is given by the leading bird, and by the nature of the case is limited to change of direction. Many of the instantaneous changes in the flight of birds in flocks are probably due to the effect of changes in the direction of the wind,

to which each member of the flock spontaneously adjusts its flight. But the need for communication by signal is clearly recognised in the case of some species. Wild geese, for example, when merely flying to and from their feeding-ground, or "changing pastures," fly almost in line abreast. But when migrating, or taking long flights inland, they fall into the wedge formation, with a leader to give the signals. Their vocabulary of satisfaction, "society," and pleasure is apparently very wide; the fowlers always speak of geese as "talking" on the sands at night.

The tame swan, on the other hand, is so silent that its specific name is the "mute swan." Though it hisses at a dog or any other enemy, its communications with its mate by day are wholly those of sight; but those who are familiar with swan-haunted rivers note that *at night* the mute swan is no longer mute. It has at least two calls, one apparently to ascertain the position of the other bird, and the other a note uttered when it is flying. It has a third note only used to call its young, which are themselves quite as conversational as goslings. A tame cygnet kept by the writer from the time it was two days old "talked" incessantly. When hungry or frightened its note was a single sharp "cheep," very much like the sound a young chicken makes in similar circumstances, but far louder. When more contented the note was double and lower in tone, and when the cygnet was thoroughly happy its voice was a continuous twitter very like the song of a swallow.

CHAPTER XXX

PUPPIES AND FOX-CUBS

POPULAR phrase has done a great injustice in making the words "puppy" and "cub" synonyms for social shortcomings. Properly understood puppies are among the most attractive of all young animals; and fox-cubs, and even wolf-cubs, are not very far behind them in engaging qualities when in their nursery days.

Mr. Tom Smith, who was at various times master of the Hambledon, Craven, and Pytchley hounds, and knew more about foxes than any man of his day, dated the birth of the fox, whose life-story he made a sporting classic, from March 25, and stated his belief that within a month from that date every litter in England was born. The corresponding generation of foxhound puppies, who are being brought up to hunt the cubs later on, appear as a rule rather earlier. Consequently the families of the hunters and the hunted are in the nursery at about the same time; and as no vixen has more than one family in a year, she is free to devote herself entirely to her cubs till they are five or six months old, and would probably do so for several months longer if the family were not dispersed by cub-hunting. Vixens are as good mothers as cats, and equally clever, both in providing food and in moving their young from

danger. Early cubs run the most risk, for there is a danger of their being killed by late hunting packs. At such times the vixen has been seen slipping off from a furze cover carrying a cub in her mouth, and if the earth is disturbed she moves them at once. Judging by the trouble taken by a vixen to put them in a place of safety, she is the most anxious mother known in the animal world. A vixen has been known to carry away a whole litter to a distance of three miles in one night when the cubs were about ten days old and beginning to be able to see. At this early age their chief danger is the "fox-taker," a character less familiar to the general reader than other types of rural malefactors. These men train their terriers to slip into the earth and drag out the cubs unhurt, which are then sold to London dealers. The dealers keep the cubs, feed them well, and sell them to people who wish to restock some foxless part of their country. Apart from the obviously bad taste of encouraging the stealing of some one else's foxes, this plan has another disadvantage; for foxes so purchased are almost always mangy, owing to the cramped and often dirty quarters they have occupied when in captivity, and wherever released they find out and make use of the neighbouring earths, so that every native fox which enters them for some time afterwards catches the disease. The worst plague of mange ever known among English foxes, which spread among foxes from Windsor to the mouth of the Severn, was propagated in the first instance by cubs bought to be turned down. It is possible that foxes are now

more susceptible to this horrible complaint than they were fifty years ago. They are more generally hunted and disturbed, and their increasing daily fear compels them to drag much of their food—rabbits, rats, and poultry—into the earth to eat it, and what should only be a sleeping chamber and place of refuge becomes a receptacle for much disgusting refuse. This is only in winter. In the spring they quickly learn that hunting is over, and leave the tainted earths.

Wolf-cubs are dropped at the end of April or early in May, and it is curious to note the progressive scale of fecundity. The fox seldom has more than five in a litter; a wolf, according to Tschudi, has been known to have nine; and a greyhound bitch will sometimes produce twelve puppies. The likeness between wolf-cubs and Chow-dog puppies at the age of two months is remarkable; though the young wolves have better feet and straighter legs, it would be difficult to tell them apart. Fox-cubs are playful little creatures, but even when taken very early seldom acquire the "jollity" which characterises puppies, or even wolf-cubs, which, though they are rather quarrelsome with each other, play and romp in captivity just as boisterously as the offspring of a collie or a retriever. In several of the large Continental zoological gardens a litter of wolf-cubs is produced every year, and is one of the sights of the season. The cubs are nearly black, with sharp noses, pricked-up ears, and long tails, which they often carry high as a foxhound does, a habit they have in common with very young puppies of

several breeds of dog which carry the tail low when a little older.

Puppies offer the best, and almost the only, study of family life open to us among animals. There are as many characters and individualities in a litter of average setter puppies as in a family as large as that described in the "Daisy Chain," and there is this advantage, that they are "all twins" and start level, and do not take a lifetime to develop in.

Not only to those "in the fancy," but to any sympathetic person, and especially to children, even to those no longer in the nursery, the excellent differences of puppies, their gifts and tendencies, growth and development, are clear, attractive, and intensely exciting. There are those who pretend to be able to prophesy about them before their eyes are open. Such persons will take the snub-nosed, sleek, round-bellied, whimpering little atoms and lay them in pairs to sprawl on a bench, and after picking them up one by one with the finger and thumb by the backs of their fat little necks, so that they squeal worse than ever and put their tongues out, will deliver themselves on the prospects of this one being a grand dog, and that a sagacious and most promising-looking female. All the time the person who ought to know most about them, their anxious mother, remains in a state of mingled anxiety and pride—pride that the gentlemen should take so much notice of them, and anxiety for fear they may be dropped. Two infallible rules for detecting early promise are believed in by those to whom the canine nursery mysteries are familiar, and who are making an

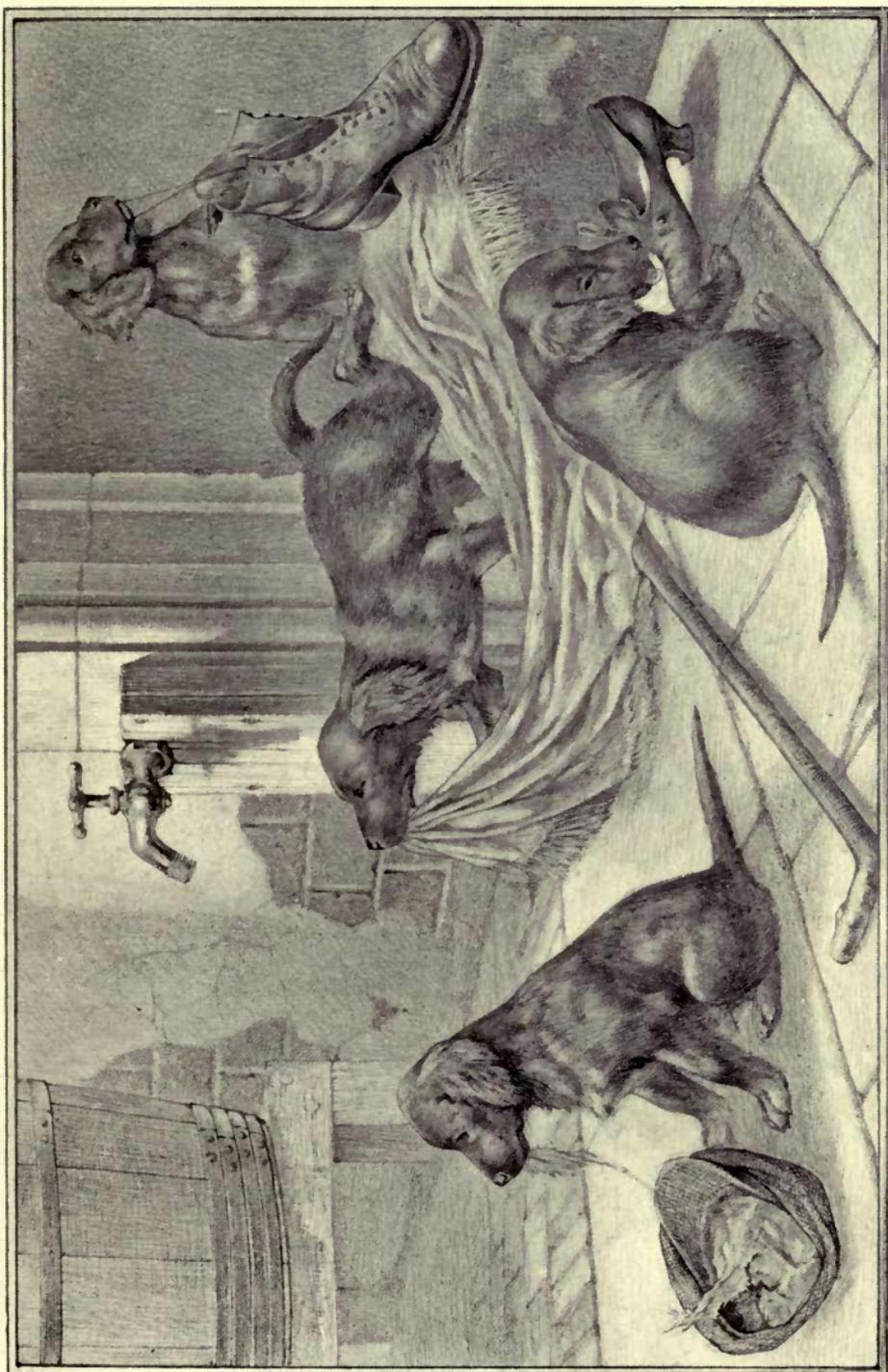
early choice, either because they are promised a puppy or because some must reluctantly be sacrificed, and they want to know which. Put all the puppies in a row on the ground, a foot from their mother, and *do not* choose those which manage to wriggle to her last, is one rule. "Stonehenge," dealing seriously with the selection of the survivors of greyhound litters, if the sad necessity arises, recommends the following, which for pure mediævalism cannot, we think, be beaten: "Let the puppies remain with their dam for a week. Then hold each up by the tail; the best ones will bring their legs well over their head, and you can see which possesses length and the promise of good ribs."

Except when asleep puppies of this age squeal all day long. When they begin to get their eyes open they also begin to crawl, for, like babies, they crawl before they can walk. At this time the litters are extremely interesting from one point of view, for whatever they are going to turn out afterwards—long dogs, short dogs, rough dogs, smooth dogs—they are all almost exactly alike in face, which is why "puppies" are spoken of as all one and the same, and not by the names of their breeds. Their noses are ridiculously short and broad, often Roman-nosed, which is more quaint than can be described, and their foreheads and brows wrinkled as with the cares of unnumbered years. When their weak little bleary eyes, which are generally rather watery, begin to open, the lines are increased by "crows' feet," and these, with the strong marks down each side of their noses as if their heads had been originally fastened on with wire like champagne corks,

make them some of the most odd little caricatures existing. When they begin to walk their bodies are generally round and fat, their feet big, and their tails thick at the body and tapering to a point.

Take a litter of six setter puppies at this stage, start them all fair on their legs, standing up, and see what they will do. It will be noticed that they walk with their noses close to the ground, like hippopotami, but with their tails up or stuck out straight, and that when they think they are going to fall they put their noses on the ground to help to balance them. At this time, too, they leave off squealing and try to bark, which they are inordinately proud of, and soon learn to do in a very fierce and forbidding manner. Being too weak to stand the shock of barking, a single bark is as much as they can usually manage at a time; and if they do this when walking it upsets their balance and they fall over. Sagacious puppies soon learn this, and sit down to bark, getting up again to walk, and then sitting down for another bark.

When once the puppies are able to make excursions on their own account, they will, if allowed the full liberty which they deserve, become a daily and hourly excitement in any quiet family. In the country house in which the litter have the run of the garden, or can even gain access to the back premises, life is a series of constant excursions and alarms, though it must be owned that the promising children make up for their mischief by an ample margin in beauty, character, and the unconscious humour with which they invest most of their proceedings. When very small and only



“THEY WILL BE A DAILY AND HOURLY EXCITEMENT IN ANY QUIET FAMILY.”

able to toddle about, they generally keep near their mamma, who, if the weather is fine, will bring them on to a lawn or grass-edging near a shrubbery, and often—as dogs are sociable by nature and sporting dogs have privileges—in sight of the windows. Greyhounds, being usually kept away from houses on account of their habit of howling at night, more often take the litter to the farmyard, or to the back court and curtilage.

Small puppies early develop the dog instinct for burying food. Any old bones they can pick up they bury, and if they can find a hole ready made, will descend into it, scratch out their own ridiculous little *cache*, and half-cover the bone in it, using their noses as shovels. Then they perhaps discover that they cannot climb out of the principal crater, and howl as dismally as if some one had beaten them. Like most small children, they never try to exhibit the slightest fortitude, but howl and shriek at any mishap—if they are frightened, if the cat scratches them, if a fly stings their nose, or if they think another dog is going to hurt them.

When they can trot, and even gallop a little, they begin collecting. This, again, is extremely suggestive to naturalists, who see in it the survival of the instinct which made the original young wolf or primitive wild ancestor begin to pick up a living, and carry what it caught, or what its mother gave it, to its den. Puppies retain any amount of these interesting survivals, but keep the acquisitive and not the selective instinct. For some weeks they regard collecting as

the one object in life, with this curious condition, that as a rule they think nothing worth taking and keeping unless they can obtain it in the house. They sit on the watch at all the doors, or keep an eye from a distance on unguarded entrances, and then trickle in like water when a sluice is partly open. When beaten they admit that it hurts; but they do it again as soon as the door is left ajar. Single puppies, puppies in pairs, puppies in strings, may be seen emerging with a kind of glum satisfaction after one of these raids, one with a boot, another with a hat, another with a duster, another dragging a door-mat and tumbling over it. They usually try to tear these things up as small as possible, with a hazy idea of burying them after. But the tearing up is the main object, and the one generally carried out. They seem to regard it as a form of work for which they ought to take credit.

Greyhound puppies have the reputation of being the most mischievous of the mischievous brotherhood of puppies. They inherit this to some extent, for a large percentage of greyhounds when grown up are inveterate thieves and chicken-killers, not from any particular vice, but because "it is their nature to," and they have not the moral sense which other dogs possess. The writer recently remarked when stopping in a country inn that one of the greyhounds which were allowed the run of the house had stolen the butter from the breakfast-table. "Ah," was the reply, "I reckon he a'most *live* on that." It is considered specially good for young greyhounds, like foxhound

puppies, to be "boarded out" or "walked" when there is danger of overcrowding at home. But, as a high authority puts it, "the list of their delinquencies, including murdered cats, fowls, ducks, torn clothes, and homesteads laid waste and devastated," *may* be made up for by a win at Altcar, in compensation for the puppies' misdeeds.

CHAPTER XXXI

DOGS ON THE HIGHWAY

It must be one of the undeserved trials of animal life that instead of being left to make the best of things as Nature made them, they are always having to learn how not to be killed or frightened to death by some new contrivance of the inventing creature, man. When bicycles first became common in the London streets it was said that dogs must rapidly decrease in numbers, partly because they could not keep up with their owners when riding bicycles, or if they did so were often overtaxed, and partly because the dogs were slow in learning to avoid the machines and so frequently caused accidents. In such cases Stephenson's prophecy as to the fate of the cow on the line is reversed. It is the rider and his machine, and not the dog, who usually suffer.

The dog, with every good intention, did not for some time seem able to realise the speed of the new invention, and other animals had just the same difficulty. A cyclist recently saw a hare trotting along the road towards him. The hare had no idea of the pace the "bike" was travelling, and only saved a collision by a twisting spring just as the wheel was on him, and barely cleared the pedal. In Holkham Park, where

hares are so numerous that as many as forty have been counted feeding at once, it was at one time quite dangerous to ride a bicycle at night-time ; for the hares, attracted by the lamp, would hop into the road right in the cyclist's path, apparently unconscious of danger. Now the hares have become more cautious, and very few dogs get into collision with bicycles in these days. But they have not yet learnt to appreciate the power and speed of the motor-car. The dog on the race-course is a byword ; still, it must have been a most adventurous or extraordinarily stupid animal which chose to watch the motor-racing at Blackpool from the middle of the asphalt track. But one really did so, and lost its life in consequence.

The first new and dangerous contrivances to which dogs had to grow used were carts and carriages—*Scoticè*, “ machines ”—for the old waggons and sledges were too slow to make much difference to their safety. In countries where dogs draw carts themselves they may understand the danger of being run over naturally. Here they always have to *learn*, first, that danger exists, and next how to avoid it, and are often far less quick to do so than are very small children. It is not till they have learnt to take care of themselves on ordinary country roads that they may be considered “ grown-up.” An old exciseman of our acquaintance always declared that next to the illicit makers of malt, the “ taxable ” puppies gave him most trouble. They were not liable to be paid for until six months old, and as there was no register of canine births, many of them never seemed to reach this age. Finally

he settled that all dogs which were allowed to "run in the road" were to be considered six months old, that being the minimum time in which a careful owner would think a puppy could learn to avoid being run over. But some dogs never learn caution, or how to "keep their heads" when even carts are passing. These nearly always end by being run over. This is especially the case with spaniels, which seem least apt at learning, and apparently feel a kind of impulse to drift across the road just under the wheels of a passing carriage.

On the other hand, there are certain breeds of dog which have the same delight in attending on a cart as certain men feel in assisting in working any piece of machinery. It is always pleasant to be able to say a good word for a discredited race of animals, and in this connection too great praise cannot be given to the now discarded "carriage-dog." These spotted, pointer-like dogs were generally considered as a useless breed, kept merely for show, as part of the old-fashioned parade once considered appropriate to a grand equipage. The real purpose in keeping these dogs was originally to keep off footpads and wig-stealers, and later to serve as companions to the horses, both in the stable and during the early days of training to harness. The young horse, otherwise constantly on the look-out for objects to shy at, transferred his whole attention to his stable companion the carriage-dog, which, trotting beside him or just in front, acted as the best possible guide and example of steadiness. Always attached to the

horses, the carriage-dog delighted most in attending on a "pair," and used spontaneously to take and keep his place exactly between the two hind wheels, or preferably under the hook of the pole. A London coachman, who for years had charge of a large and beautiful stable of superb carriage-horses, told the writer that a carriage-dog owned by his master invariably ran beneath the pole-chains the moment the carriage started, and would make the circuit of the park several times without moving more than a few inches from his place, the three animals—two horses and the dog—moving like a machine. Curiously enough, the dog chose his particular horse to live and sleep with in the stable; when travelling and in inn stables it mounted guard over this horse's box, and would allow no strange ostler or groom to approach it.

Greyhounds also learn to run with traps. It was the custom for sporting farmers in East Anglia to drive to market with a pair of these dogs, either running with their heads just beneath the tail-board or one on either side of the cart. Their pace was a trot, step for step with the horse.

The use of carts and carriages for locomotion is much more readily learnt by dogs than the art of keeping safe among traffic. Sporting dogs soon learn to like being driven to the shooting ground. When accustomed to this they will jump up the moment the tail-board is lowered, and curl up under the seat, and show great discontent if not offered a place. But nearly all are singularly dull

at devising any means for safe descent when the drive is over. They usually make a violent spring to the ground, often when the cart has scarcely stopped, and fractured forelegs are a frequent result. Trains present far less difficulty to them. Though occasionally afraid of the rush and noise, they soon learn to delight in travelling by rail—if allowed to accompany their masters. They rush in the moment the door is opened, and some dogs, notably those which are accustomed to comfortable drawing-rooms and soft carpets, will always select a first-class carriage in preference to a wooden-seated “third.” A setter which had done a good deal of railway travelling was considerably alarmed when she first saw an *electric* train, but once on board she took far less time to find the compartment she wanted than most people would have done. After one disapproving glance at the upholstery of the first car she entered, she ran straight through it into the next and at once curled herself up in a red velvet fauteuil.

But though they have learnt to reckon with the speed of a carriage, and become so fond of railway travelling that “railway dogs” who travel by choice and alone are quite common—there is a “Ryde to Portsmouth” dog too, which travels by boat, and begs pennies for buns—no dog, and we believe no domesticated animal, has ever learnt to judge the speed of a train. When once on the line they seem, in this country, quite unconscious of danger. If the train is moving at the rate of from five to twelve miles an hour, they get out of the way; but

a pack of hounds on a railway line, even if they are not in full cry, are always cut to pieces by the first fast train which overtakes them. The first thing which the driver does when he sees them is to shut off steam. This makes the engine noiseless, but the whole train rushes on, plainly visible, but with absolutely no terror for hounds, who seem to look on the swift, silent thing as perfectly harmless. If it were a corn waggon or a puffing traction-engine they would get out of the way. When the short line of railway was made across the neck of the Dobrudscha in Turkey, from Kustendji to the Danube, the Turks were almost as stupid. They seemed unable to realise that the train would not stop, and would drive their sheep along the line, while one man endeavoured to stop a runaway truck by putting his foot on the rail.

Birds, perhaps from their own power of speed, more probably from their quicker brains and powers of observation, *do* thoroughly realise the speed of trains. Instances in which they have been killed by a passing engine are very rare, though partridges and grouse rising suddenly in front of a train often fly against the telegraph wires. That this is *acquired* knowledge, though probably transmitted now from generation to generation, and that birds were possibly killed by trains or incommoded by them in the early days of the railway, seems evident from the following facts. The invention of the "torpedo-boat destroyer" raised the maximum speed obtained at sea at a jump from twenty-five to thirty-one knots. The speed of

a destroyer running her trials on the Maplin Sand was about double that of the ocean-steamers and cargo-boats which commonly pass out of the Thames mouth, to which sea-birds were thoroughly accustomed. One of the Thornycroft destroyers was running her trial at top speed, when it disturbed a large flock of wild-ducks. These, according to their invariable habit, rose at some distance ahead, and flew in a direction across the vessel's bows. They rose at what was their accustomed distance when put up by a steamer, but had wholly misjudged the speed of the destroyer. Instead of crossing one hundred yards ahead, the whole flock came right upon the vessel, and broke up in dismay over the smoking funnels of the craft. Had she been carrying masts and spars the ducks would have collided with the rigging.

Telegraph wires, with the exception of those by the railway lines, are only a permanent danger to night-flying birds and to game, which, flying fast and being often frightened by shots, are constantly killed by them. But as a rule the birds native to the spot learn to avoid them. The swans on Brading Harbour appear unable to avoid the wires, even in the daytime, unless special means are taken to make them readily visible. But swans are unusually stupid birds, and the angle at which their heads are held in flight, together with the knobs at the base of their bills, may prevent them from seeing what is immediately in front of them. The City pigeons are seldom killed by the mazes of telegraph wire above the roofs, but a strange bird, such as a carrier pigeon let loose in

the streets, is often cut to pieces. Even a single wire, newly put up, is very destructive, until the birds have learnt caution. One recently erected near Cambridge led to the discovery of a permanent "short cut" used by migrant birds from Cambridgeshire to the Thames mouth, their bodies being discovered beneath the wire, though, as they fly by night, their passage had escaped observation.

The nervous fear of new inventions, which makes animals afraid where fear is unnecessary, is much sooner unlearnt than the proper degree of caution is learnt. Horses, for instance, are practically indifferent to the sight of a railway train, and cattle which had travelled by rail, as Charles Dickens early noticed in the fields north of London, very soon learnt to disregard the steam-engine.

Motor-cars of any description are, of course, more alarming to them, for they meet them at much closer quarters, and a carriage which apparently goes along of its own accord naturally strikes them as uncanny. But they are rapidly growing used to even these, and whereas a few years ago motoring was a very questionable pleasure to any lover of horses, on account of the terror which a car produced in half the equine population, most of them are now perfectly indifferent, and it is possible to motor hundreds of miles without alarming a single horse.

CHAPTER XXXII

THE SIMPLE LIFE

A WARM, rainless summer has a good effect on the health of almost all animals, whether wild or part of the live-stock of the farm; and in spite of a frequent scarcity of grass, cattle and sheep thrive far better at such times than in a dripping season when the herbage grows green and rank all the summer through. This is due partly to the absence of wet and damp, which domesticated animals have often not the same means of avoiding as they would enjoy in natural freedom, and still more to the fact that sunshine and drought are destructive to those low parasitical forms of life which wet seasons always engender.

As a rule cattle are far healthier in the fresh air than under cover. It was noted in the South African war that the constant life in the open air led by our soldiers did more than anything else to promote health. Sleeping every night on the veldt, often in the rain, constantly in frosts which whitened every blanket in the morning, and with absolutely no comforts, they actually improved in health and physique when the food supply was at all adequate. On the other hand, like the animals, they suffered incredibly from water-borne disease when the supply was tainted. But the "open-air treatment" incidental to the con-

ditions of the fighting was a steady source of strength and vitality.

The question of the degree to which domesticated animals, or those kept in captivity, benefit by fresh air in a climate like ours, has been raised in a practical form lately by owners of pedigree cattle and by the managers of Zoological Gardens. In the London "Zoo" the new and very costly house for the anthropoid apes has been built more on the "hot-house" system than with the idea of trying how far access to the open air would benefit the inmates. As most of these come from the tropical forests of West Africa or the Straits Settlements, perhaps the decision was correct. Yet we seem to have read of very cold and comfortless weather both in the Congo forests and in those of Java and Sumatra. If the apes can endure such a temperature at home, it does not seem unlikely that they would benefit by enjoying the fresh air of an English summer.¹ At the Dublin "Zoo" a most remarkable success was obtained by subjecting a pair of very weakly lions to the open-air cure. They were allowed to remain in the open all the year, with only a shed to retire to, and no artificial heat. The result was that they grew thick, warm coats, and improved so much in health and condition that instead of being the worst, they became the best lions in the collection.

The great interest taken by breeders of high-class

¹ If they were thus accustomed to change of temperature, they might be taken for change of air in winter to Broadstairs or Margate. It would be interesting to see whether the effect would be as beneficial to the baby apes as it is to human babies of a tuberculous tendency.

cattle in their animals has led to some useful discoveries as to the difference in constitution between those kept in the open and those living under cover. When the tuberculin test was applied to milking-cows kept shut up in town dairies, such as was once the universal rule in London before the milk supply came in by train, nearly *ninety per cent.* of the cows which had been entirely in the sheds for from one to two years showed "reaction"—*i.e.* symptoms that they were affected with the disease. Of those kept under cover, but sent out for part of the day for exercise, a much smaller percentage were affected, but the figures were still high. Of cattle kept entirely in the open, either none or only two per cent. "reacted" when tested.

One of the oldest and best herds of Jersey cattle in England—cattle which from the fineness of their frame and skin are supposed to be "delicate" (*i.e.* to suffer from the weather)—lives almost entirely in the open, and what shelter it enjoys is of a kind which might almost be supposed to be rather less useful than none. The animals are tied up at night in an open shed, with no front wall, and the snow or rain drifts in among them. The roof is so narrow that the drip only just clears their bodies, and being tied up, they can do little to change their position. Doubtless those of the present generation represent the survival of the fittest. But the death-rate is unusually low. Air and light are the great enemies of tuberculosis, which seems to typify the idea of the actual destruction of bodily tissue more than almost any other. The same also holds good in the case of

some of the more violent infectious diseases, such as plague, cholera, and perhaps diphtheria. The creatures which mainly succumb to plague, and carry its germs, are precisely those whose lucifugous and filthy habits withdraw them most from fresh air and sunshine—namely, rats. It is also well known that where foxes are much hunted, and therefore carry their food into the earths, and lie there by day, parasitic disease, especially mange, is often rife among them. Experiments have recently been made in fattening sheep under cover, the object being not to promote health, but to obtain a rapid deposit of flesh. But it was found that at first the deprivation of exercise, air, and natural light upset their system so much that there was a doubt for some weeks whether the experiment would pay, even from the limited point of view from which it was begun.

One of the first scientific protests against dark and damp stables was made by the late Sir William Flower, who, in closing his popular lectures on the horse, drew attention to the fact that the natural conditions for equine health were hard soil, open air, a bright sun, dry food, and constant exercise. By far the greater number of so-called common colds and chills in horses are caused by placing them in close stables after having been turned out in the open, *not* by turning them out in the open from warm stables. The only wonder is that under domestication our horses have not suffered more from the unnatural conditions in which many of them are kept. Probably the long hours of daily work prevent them from

feeling the bad effects of the ill-built, ill-ventilated, and ill-lighted stables which the working horses of London often inhabit.

Cold has no ill effect on most animals if it merely takes the form of low temperature. Their bodily heat is considerably greater than ours. They have also exceptional means for adapting themselves to cold. The rapidity of the growth of protective and non-conducting hair is astonishing. A Bactrian camel, which is almost or quite bare of fur in the summer, grows a coat in the winter on which snow would lie without melting, just as it sometimes does on a sheep's back. Even carriage-horses if turned out to grass soon develop a fairly thick jacket of hair; and the Arctic fox and Rocky Mountain goat gain a felt which must be absolutely frost-proof. When the latter animal sheds its winter coat it might be thought that about one and a half feet of Witney blankets were slowly disintegrating and becoming resolved into the original wool, were it not that that of the goat is far finer and warmer. The white cotton-like wool shed by the male goat would stuff several pillows. The growth of hair on the Scotch cattle which are left out all the year on the wet and wild mountains and pastures of the West Highlands is also remarkable, though it is not so proof against wet and cold as the "buffalo robe" or the winter fur of the European bison.

It would seem, also, that the neglect by a vast majority of animals to make any form of house or nest in which to sleep is evidence that the open air suits them best throughout the whole twenty-four

hours. As a rule, it is for the young that a house or nest is made, and that only by certain species. Life in the open is what the adults instinctively seek.

What drives almost all animals to seek cover, even at the expense of less wholesome air, is wet, especially torrential cold rains such as sometimes usher in an early winter in this country. It will be found that the wet temperate regions are always among the least productive of animal life. In the gloomy and dripping forests of Tierra del Fuego, where a mean temperature as high as that of Dublin is accompanied by constant wet and little variation caused by sunshine, Darwin found almost no mammals at all. There were no deer south of the Straits of Magellan, and in the forest region proper only one bat, three kinds of mice, a mole, and one fox, the other species being confined to the drier parts of the country.

There seems reason to believe that, to avoid the destructive autumn rains of Europe, several of the creatures which in drier regions live mainly in the open became "cave-dwellers" during the time preceding their extermination by man. Most of the ancient lion legends of Europe represent the lion as living in a *cave*, the Numean lion among the number. The tale of Androclus and the lion, though said to be of African origin, also represents the lion as resorting to a cave. In ancient Britain in the prehistoric period there seems to have been a regular cave-dwelling fauna, including bears, lions, tigers, and hyenas. We may possibly conclude that the climate was even wetter than it is now, and that a cave

was the only moderately weather-tight shelter in which a lion or bear could live without contracting rheumatism.

There are, unfortunately, certain disadvantages and dangers which domestic animals incur if kept in the open after a plague of rain and waters. The pastures are full of what the Cumberland farmer calls "'demicals"—*i.e.* parasites of all kinds, liver-fluke, strongylus, and other deadly and little-known plagues, the eggs of which are eaten in the grass, drunk in the water, and may even stick to the animals' coats when they lie down and be swallowed after they have licked their jackets over by way of toilet. With their vitality lowered by the bad quality of the food they graze upon, they are more likely to fall victims to these insidious enemies. Low-lying ground, or meadows which are flooded, are particularly dangerous to all stock at this time. Nor is it easy to take precautions, because the symptoms of illness do not appear until months after the animals have absorbed the origin of the mischief. But it will be seen that these and similar dangers arise not from the air, but from the earth. It should be remembered when leaving animals in the open that on ordinary pastureland they have little or no natural shelter available against storms or sudden cold, such as they would have been able to find if in a wild state, and that sheds or shelters of some kind should be open for them to seek refuge in during exceptional weather.

CHAPTER XXXIII

THE PREHISTORIC FARMYARD

THE collection at the Zoo of all the equine animals now found on the globe, gives ample scope for conjecture as to how the horse as we know it was developed from this material. Perhaps it was not developed from them at all, but from a more horse-like animal than any of them, which has disappeared from wild life, even as the original wild ox has disappeared from the forests of the West. But a survey of all domestic forms only strengthens the impression that the original tribes first drew them from the wild species with which they were in contact. It is still done by the Lapps and the jungle tribes of Assam, and the process as it goes on to-day affords scope for conjectures as to what the "prehistoric farm" must have looked like.

Probably the farmyard of one of these early communities did not contain many varieties of stock; neither would the judges of an agricultural show have had many "classes" to deal with. It is the very natural tendency of early efforts at domestication in any form to be limited to the reclamation of a single species. This in itself is difficult enough. The ambition to possess a *variety* of domestic animals

must be a much later idea. It is generally suggested from outside by travel, or the immigration of other owners with a different class of beast. The Kaffirs only took to owning horses very gradually. They were content with their cows, even as beasts of burden; and to this day, the Lapp makes no effort to add to his primeval herd of reindeer either the ponies, or the cattle, which his Norse neighbours have maintained, in regions as hyperborean, ever since they migrated to the far North.

The reindeer herds of the Lapps, the Samoyeds, and the East Siberian tribes continue to flourish without the slightest attempt to improve or alter the wild breed. The peculiar conditions and climate make variation or modification unlikely. Hence, though the use of the reindeer may be as old as the use of the horse, it has left the type unaltered—an instance of primitive reclamation “preserved in ice” within the Arctic Circle.

The next examples are similar in kind. In Assam the wild ox or gayal is regularly “taken up” from the jungle and domesticated. The wild cows are decoyed by balls of salt, and treated with this luxury till they mingle with those which have been previously domesticated, and are gradually incorporated in the herds which are driven out into the jungle to feed, and brought home to be milked. In the case of the Indian buffalo and the Burmese elephant the tame and wild species are also seen living in the same forests, and recent travel has discovered the wild snow-camel on the cold deserts over which the tame camels have

for ages transported the goods of the Far East to the markets of the West. Except the buffalo and gayal, none of these animals could be expected to be much modified by human interference. The reindeer and elephant are specialised by Nature for particular conditions, and as it is precisely for use in those conditions that they are maintained, no one would attempt to introduce differences. No one would try to make a better elephant or a more useful reindeer, because improvement for their particular life is scarcely conceivable. The snow-camel *has* been slightly altered; for, as he is wanted to carry heavy burdens, he has been made vastly larger and stronger than when wild, though the connection with the original stock is plain.

Other creatures are not so specialised, and were altered—probably in no great time. But first it was necessary to “catch your hare.” It is not difficult, and is certainly interesting, to picture the early and ambitious would-be pastoralist considering which of the animals in his native wood, or on the mountains near it, would pay best to catch, and how he was to tame them. He certainly went through some such process in his mind. In Europe, for instance, there were at least two large wild bovine animals, one a bison, the aurochs, the other a real wild bull—*not* a bison. Whoever the first cattle-tamers were, they certainly decided to catch the latter, and had nothing to do with the bison, for they tamed the one and left the other severely alone.

It must have needed some courage to capture

even the young of the dreaded urus in the Hercynian or Calydonian forests ; nor is it easy to conjecture how these ancient herdsmen were able to keep in their possession herds of animals naturally fierce, and of which the male descendants are to this day the most dangerous and uncertain of any domesticated animals. The difficulty of retaining the reclaimed stock must have been greatly increased because, in the absence of enclosure, which is not universal even in civilised Europe, all grazing animals have to be *led* out to feed daily, when they have every chance of resuming the wild state. But it is difficult to suppose that our cattle, or those of the East, were first obtained in any other way.

There exists in the Malay States a small wild ox, the anoa, which is perhaps the survival of one of the wild species from which the smaller Eastern breeds are descended. But it is no evidence that a domestic species is not descended from a wild ancestor if this ancestor is not now existing. We should have known nothing of the wild bull of Europe were it not for the records of books and bones, and should not have had these if the breed, instead of existing down to historic times, had perished some four thousand years earlier, as they may well have done from the plains of India.

Pigs were probably a European "reclamation." In the tropical East no one wanted them, for they were neither wholesome as flesh nor givers of milk. But in every case, in Europe and Asia, there is practically only one wild pig, except the babirusa, which may have been the origin of some of the Chinese breeds. In any case, the enterprising domesticator of pigs in any form

must be honoured before the disciple of Confucius who is credited with having discovered, merely by accident, their merits when roasted. We can quite understand how the resolve arose. What could be more natural to the tribesman, or the village, who already possessed a small and increasing herd of dairy animals reclaimed from the forest, than to follow this up by catching, either in nets or pitfalls, a family of young wild swine and adding them to their farm stock? Their prolific character must have been well known, and as Mahomet promised a blessing and angels' visits to the home which possessed three goats, so the neighbours must have looked with envy on the recurrent families of wild piglings in the wicker-fenced enclosures of the more adventurous. It is possible, even at this distant date, to trace under the artificially rounded form of the Tamworth breed the long, suspicious nose, the rufous bristles, and the thoughtful eye of its original wild ancestor.

If the East troubled not with the pig, it probably gave to the world its flocks of sheep and goats. Asia is the true home of the domesticated goat. It is there that it flourishes and is held in honour. There, too, lives the animal which by general consent is the original of the common domestic breed, the wild Paseng-goat, or ibex, call it which you please, of Asia Minor and Persia. There would not be the slightest difficulty in domesticating the young of several species of mountain sheep to-day, if this were desired. Difficult as the lambs are to catch, they *are* taken when very young on the mountains, and the only difference in their behaviour is that though

all become as tame as the proverbial "pet lamb," some species—notably the Barbary wild sheep and the Indian burrhel—become more markedly friendly than others. All, wild goats and wild sheep alike, have short, smooth coats, though the Barbary sheep grows a woolly mane; but there is *under wool* in the fur of all the sheep, which care in domestication would increase. The tame species have lost their speed and agility on the English fields, but not on the Alpine pastures, where some of the breeds are not unlike the surviving wild species, the moufflons of Sardinia. Even in England there still remains one rare local variety, the Wiltshire sheep, which is so active, long-legged, and free from woolliness that it might easily be mistaken for a wild species; and in all probability it closely resembles the original ancestor of our British breeds.

It is tempting and easy to imagine "lost" animals from which our tame ones have sprung. But it seems highly probable that the majority of our domestic animals may be traced to ancestors almost identical with wild species still existing; and they themselves might still have been indistinguishable from those wild ancestors if their intermediate progenitors had not been caught and tamed by man.

CHAPTER XXXIV

ANIMALS AND THEIR CLOTHES

A DISTRIBUTION of horses' hats, presented to the poorer owners and drivers of horses, recently took place in Vincent Yard, near Vincent Square, Westminster. The hats, of the most approved pattern, were given by the society known as Our Dumb Friends' League; and the applicants, cabmen, car-drivers, and vanmen, numbered over three hundred. Having received the sun-bonnets for their horses, they contributed very liberally to the box placed for donations, one carman giving two shillings, probably more than he would have paid for a summer hat for himself. They were very well informed as to the different "makes" of sun-bonnets for horses, and expressed their approval of that adopted by the society, which was of the highly practical kind, standing well away from the head so as to allow a current of air to pass through, and not interfering with the natural movements of a horse's ears. The men soak this hat in water, which makes it a still better protection in semi-tropical weather.

Before long all our horses, excellent creatures as they are, will no doubt be provided with hats in hot weather. It is also probable that many who now go

without coats in cold weather will expect to share the privileges of their carriage and racehorse friends, and have smart suits for the winter. Horse clothing is now almost confined to the higher ranks of equine life; for as long as a horse's coat is thick and rough it is a good "non-conductor," and the natural covering of a sheltie, or a Celtic pony, or a Prejvalski wild horse gives ample protection against any amount of cold and wet. But such a coat would be very inconvenient to a more sophisticated horse; it is far too thick and hot for fast work, and too difficult to dry and clean, so art and nature have been combined to get rid of this thick natural overcoat, and well-bred horses are provided with coats suitable for all occasions like their masters.

Though they are provided with most attractive and well-cut suits, they occasionally tear them up at first as a useless encumbrance, but learn to appreciate them later. To teach this "anti-cloth biters" are sold, just as children are made to wear gloves to prevent them from biting their nails. Some horses are even measured for their suits, though the majority have to content themselves with "reach-me-downs" made to sizes. They have the distinction also of having their "things" marked—with the monogram of their owners.

There is no knowing what this extension of the movement to hats may lead to. That simplicity which Carlyle thought he had discovered in the world which does *not* wear clothes may possibly be impaired. Animals may learn in time, like Teufelsdröckh, the

enormous importance and significance of clothes. It is remarked that among the naked Kavirondi of British East Africa (now put into trousers) immense hats, made of clay, bamboo, and feathers, were in vogue when no other garment was even thought of. Horses may soon not like to go into the Park in unbecoming hats. They may learn by some form of instinct that even at this moment paragraphs are appearing in the papers complaining of the want of variety and the plainness of their headgear. Hitherto one of the pleasures of the Park in the season has been to see the undoubted self-satisfaction of the horses in their best harness and ribbons. Shamefaced horses, unable to hold up their heads when they passed and repassed other pairs which they knew despised their hats, and would mention it afterwards, would detract much from the feeling of the thing.

When the sage of Chelsea in "Sartor Resartus" drew his comparison between the horse wrapped only in his own skin and the rider invested in many portions of the skins of other creatures, he was, strictly speaking, not quite accurate. For horses, or at any rate modern rich men's horses, are the most carefully clothed of any animals. Complete Jaeger suits are now advertised for their use. Like gentlemen who wish to get into training, they are often muffled up in them and ridden so wrapped up to get off weight. Nor is it likely that horse clothing will ever be in less request than it is now; for though they no longer wear armour, and only funeral horses appear in velvet and feathers, patent shoes and shoe pads, bits, action developers,

various kind of stockings, mane trainers, and tail protectors, all form part of a well-provided horse's wardrobe.

When Oliver Cromwell inquired affectionately after the "little brat" with which Dorothy Cromwell had presented her husband, he was, according to current belief in the North, alluding unconsciously to a form of animal garment. The lambs are fitted, before going on to the hills, with waterproof coats, called "brats." These lambs, or young sheep, are also called "brats"; whence the name for babies.

Everybody knows that in Holland the cows wear rain-proof jackets all the winter, which are only taken off late in spring; but these are very cheap compared to horse clothing, which costs about £3 a set. Horses also have night rugs and extra rugs, about 36s. the two, and summer suits also, costing about two guineas. Coats for show cattle are quite the fashion in England, especially when they are sent to a distance. A really smart Jersey cow would not like to be seen at a show without her luggage—a chest containing not only her sleeping jacket, but her brushes and combs, cosmetics, and horn protectors. She puts on, or has put on, a smarter jacket in the daytime if she has to stand in a draughty place. If she is not sleeping out it does not so much matter. There are many ladies who would almost go without a jacket themselves rather than see their best animals go to a show without proper clothes.

The following interesting sight was lately seen in Kensington Gore. First came a costermonger, his

horse duly "hatted," and the hat trimmed with ribbons. Next came a lady in a victoria wearing a hat. Her horse also had a hat, and *both* hats had pink flowers in them.

The assumption of garments is carried to such a pitch of elaboration by some animals that they actually wear, or are made to wear, disguises, "and the same with intent to deceive." There is a duck-decoy dog known to the writer which has begun, in the first instance, by growing as like a fox as it is possible for a dog to be. This in itself is vastly attractive to the ducks, which seem to have an irresistible impulse to swim after a fox and see what he is up to. But after a few days they get used to the dog, and do not feel any more curiosity. Thereupon his master supplies him with a disguise, tying over his shoulders and back a jacket made out of a dirty-white sheepskin rug. The dog dances about with delight as soon as this is put on, as he knows that it means a fresh start in life for a day or so. The ducks soon get tired even of that; whereupon the dog's master takes down another dress from a peg in his reed-shed, a black rough woollen jacket, and tries its effect. The dog apparently knows exactly what it all means. There is another decoy dog in Yorkshire which is fitted up with a complete fox-skin over its back, with a brush to make the disguise more complete.

Some controversy arose lately with the local authorities near Epping Forest as to whether a pig could legally be kept in a dwelling-house. The owner of the pig kept it as a pet, and pleaded that it was an

educated pig, and quite a house pig in manners. The local authorities held strong views about the subject, were not convinced, and made an order for its expulsion, or for the closing of the house. It was then pleaded that the pig wore a jacket, slept in a bed, and when in bed had a night-gown. This settled the matter, and it was reported recently that it was exhibited duly clothed and in bed to a number of interested visitors.

It is commonly believed that monkeys which are made to dress up and wear clothes do not like it. This is a mistake. They would tear their "things" up directly if they did not like them. Sometimes they begin by doing so, but they soon learn that they keep them warm, though their wretched frivolity prevents their taking any real pride in that or anything else. But a large ape, such as a chimpanzee, will exhibit the utmost solicitude about the arrangement of any simple garment, such as a cloak or blanket. It will spread its blanket, take it up at the corners, and lay it over its shoulders as carefully as an old lady arranges her shawl. It would be an interesting experiment to see whether the apes have any preference for a red blanket over a blue or brown one.

"Prince," a very intelligent penguin kept at the "Zoo," was presented either annually or once every six months with a scarlet-and-gold jacket. He used to come hopping up with joy to have this put on, perhaps because he liked the coat, or perhaps because he associated its appearance with a walk in the garden outside, which was his privilege when wearing it.

Of the follies of the Parisian ladies in overdressing



“TO KEEP THEIR PETTICOATS DRY, THEY ARE CARRIED OVER BY THE KENNEL-BOY.”

lapdogs we do not propose to speak. There is no reason to think that the wretched little creatures like the frippery or understand its smartness. Except "Oriental Bill," who was a very abnormal old bulldog, and seemed rather to enjoy being put into the little striped "sweater" some one gave him, dogs, generally speaking, hate clothes. A dignified old setter, made to shove his fore feet and legs through the arms of a boy's jacket, and to have it buttoned round his neck, may not growl, but his face is the picture of misery. He thinks he looks a fool and is being made game of, and when released withdraws in sulks. Greyhounds, which are exceptions to dog-character in several ways, and are very chilly creatures, have by long experience learnt to wear clothes, and appear rather to like them. They generally look particularly spruce and bright in them. Their clothes are less expensive than might be expected, as they have ordinary clothes and waterproofs. "Slip cloths" cost about 15s. each; waterproofs, 12s. 6d. When coursing in the marshes of the East Coast, the necessity for their wearing clothes causes a good many comical scenes. The marshes are divided by broad drains or ditches full of water. Over these very narrow planks are laid, which are often slippery. The greyhounds, being in couples, are unable to walk over them together, and even when uncoupled are very apt to slip in and "wet their frocks," which would never do, as the wind blows icy cold over the flats. Accordingly they are picked up, sometimes singly, sometimes one under each arm, by the attendants; and anything funnier

than the sight of a tall, lanky kennel-boy sidling cautiously over one of these planks with a long, meek-looking greyhound under each arm, and its tail and petticoats hanging down below the carrier's knees, can scarcely be imagined.

CHAPTER XXXV

COMIC ANIMALS IN ART AND NATURE

CARICATURE of animals seems to grow in favour among the readers of comic papers, and popular natural history has extended the limits of what was always a favourite subject. Mr. E. T. Reed has for some time been able to amuse the subscribers to *Punch* by a series of humorous drawings, in which the main figures are caricatures of extinct monsters, as restored by Figuier and others—caricatures of palæontology, which would have been too remote from common knowledge to amuse had they been drawn twenty years ago. As it is, Mr. Reed makes his monsters much more alive, scaly, knobby, and squirmy, than the best illustrators of scientific books. But they are for the most part studies in grotesque. The creatures hardly admit of caricature. The humour lies mostly in the setting of the piece, in the contrast between the absorption of the prehistoric men in their sports and games, and the practical interest which the prehistoric monsters as cool spectators take in *their* little game, which is to secure and eat such of the players as they may select. The fact that few, if any, of the monsters represented were co-existent with primeval man does not in the least detract from the joke.

The origin of the art of animal caricature, if, like Mr. Herbert Spencer, we go back to origins, seems to have been double. Gods were drawn as men with animals' heads, to give them the dignified attributes of the eagle, the bull, or the lion, or men were drawn with the faces of less reputable beasts for the opposite reasons. Caricature seized on both methods for its own purposes, and in its earlier treatment did not differ greatly from that which drew the "trusty servant" beloved of Wykehamists with a pig's face, because he was not "nice" in his eating, long ears to overhear, and a locked tongue for prudence' sake.

But modern art has added a third phase—the simple drawing of animals as they are, or with small accessories of costume, drawn with such nice observation of the humour of animal form and expression that it is perhaps the most effective of any. Some of the very best examples of this, the highest form of animal caricature, are the drawings of Sir F. C. Gould, Mr. Shepherd, and the admirable illustrations to the "Peter Rabbit" books.

But these are all of comparatively recent date. For very many years Sir John Tenniel was the best and almost the only exponent of this branch of his art. In his cartoons the British lion appeared more often than any other beast, but it is very rarely represented as a comic animal. The bear and the fox lend themselves better than any other creature to this veteran caricaturist's feeling for animal humour. The latter is the hero of two out of a series of three cartoons on the relations of England and Germany in

the scramble for Africa. In the first the lion, not caricatured, is being coaxed by the German on one hand, and stirred up by Mr. Stanley on the other. In the two last the fox, disguised in a shovel-hat, umbrella, and "pantoffeln," is the hero. In one he addresses the lion with a budget of anti-slavery papers: "You, that so nople are—so strong—let us in this so holy crusade together join!" He is a real fox, infinitely sly. But the foxiness is surpassed in the last cartoon, where the animal, having laid down his pipe and umbrella, has pulled down a placard of "Down with Slavery!" and is unrolling "Up with Slavery!" looking over his shoulder the while with a quiet furtiveness more animal than human, which, unaided by the setting, makes this single figure a masterpiece of expression.

Another political cartoon "made in Germany" naturally represented a different view of the same question. It sold largely in Holland shortly after the Jameson raid, gave huge delight to sober-minded grown-up Hollanders, and even more to the "Young Dutch party" man when he diverted his serious boyhood by a stroll among the shops of Amsterdam. It represented John Bull as a "land hamster," the greedy field-rat of Germany, who has already stuffed Venezuela and Egypt into his cheek-pouches, and has sent his pet dog, Dr. Jameson, into the Transvaal, though a notice at the gate gives warning that trespass is "streng verboden." The dog is just being let out of a trap, labelled "Johannesburg—made in Germany," and the hamster, got up as John Bull in a red coat

and tall hat, is running away with his pet fastened to a chain, pelted by the Boers, while the other nations rejoice, and a boy in uniform is seen running across the veldt with a packet labelled "telegram." The whole composition is most comic, except the central figure of John Bull as the hamster. The reason is that the hamster, though his greediness, his sulkiness, and general character as miser and misanthrope make him a fitting object for the caricaturist's art, is not one of the obviously comic creatures, being nothing more than a fat, rat-like animal, with a short tail and a blunt nose.

The list of comic animals is not very long, and the comic elements in each are by no means the same in kind or evenly distributed. Those animals which have some particular feature greatly exaggerated do not necessarily raise a smile, any more than a vulgar caricature which depends for its comic element on the enlargement of a nose or a stomach is necessarily amusing. There are several creatures which seem to have been made for this "low-comedy line," but they are far less funny than others that, like the prairie-dogs, are quite pretty so far as form and features go. The obviously comic creatures, with no reserve of intention to back up first impressions, are the "long-nosed monkey" and those other quadrumana whose legs, tails, beards, or mouths are exaggerated caricatures of human members; yet the monkeys are not by any means the most humorous of animals to look upon. In a list of the animals which are always mirth-provoking the sources of the amusement caused are

curiously different. Young puppies when just learning to walk are invariably comic. Their noses are square and blunt, their youthful faces wrinkled and lined, their eyes weak and bleared, and their voices cracked and squeaky. This gives the appearance of age in very young creatures, and as they are round, fat, and have large feet, they are not at all unlike little hippopotami—an instance of animal caricaturing animal.

Frogs and toads have their special vein of comicality, due to their staring eyes, consequential, stupid mouths, fat stomachs, and sticking-out elbows. There has been a consensus of human opinion about the frog's appearance from Æsop and the authors of "The Battle of the Frogs and Mice" to Mr. Ruskin in his remarks on Bewick's little picture of the frog, underneath which the old engraver had written, "Set them up with a King indeed!"

Pigs, especially happy pigs, when not too fat but only "well liking," and free to wander in a big yard and forage for themselves, are among the most comic of all animals. Almost all the necessary elements are present—fat bodies and fat cheeks, twinkling eyes, tightly curling tails, short turned-up noses, voices capable of expressing in a grunt intense greedy self-satisfaction or curiosity, and all forms of squeaks and squeals for surprise, fear, and panic. The writer recently watched a family of young pigs, about eighteen inches long, just turned out to spend the morning in a meadow; and returned convinced that there was not a moment at which their appearance and behaviour was not too comical for

description. Each flower and weed was tasted by the little pigs with the air of a connoisseur trying a new dish, and when they found a horse lying asleep taking its Sunday rest, the whole litter stood in a semicircle round its head as if grouped to sing in a pantomime.

Pigs are so funny, and every one so thoroughly recognises the fact now, that it seems rather odd that the discovery should be so recent. There is plenty of allusion to the pig as a filthy, ugly creature in the East, and many old English anecdotes of their cunning and knowing ways about weather and food, but except the pig-selling scene in "The Acharnians," which is sadly wanting in humour, there is hardly any early recognition of the comicality of pigs. The reason is that it is only the *modern improved pig* that is comical. His alone are the round stern, the curly tail, the short nose, the dumpling cheeks, and the fine high spirits. The wretched greyhound-pig of the East, or of the unimproved breeds of Europe, has not an atom of humour in him. Even a young wild boar is a glum little fellow, only growing lively as he grows hungry. We owe the comic pig to the encouragement of the Smithfield show and the Royal Agricultural Society, and these and other similar institutions have profited in a quite unexpected direction by the comical appearance of the animal they have helped to produce; for the whole demeanour of the modern pig is so mirth-provoking that the pig department at a show is always crowded, and every human face seen there is wreathed in smiles. A full "entry" of pigs is almost essential for a good

“gate,” and a swine-fever order is more dreaded by show secretaries than an inopportune race meeting or a wet day.

But there is room for difference as to the humorous side of animal life in creatures which are not domesticated and have never changed. The owl is a case in point. The Greeks looked upon him as a grave and wise bird, and assigned him to Athene. We think his appearance comic, and in common talk the owl represents a bewildered, rather dense person who cannot see the obvious. Though the Greek revered the owl, Hindoo feeling is exactly the same as ours. To call a stupid servant “Ooloo” (“You owl!”) would convey exactly the same meaning in India as it would here. A physical explanation is just possible. We and the Hindoos think of the night-owl, a bird bewildered by light. Athene’s owls, which are now sold in large numbers in London as pets, are little, wideawake ground-owls, able to see by day as well as by night.

Most people who have watched penguins hopping on the ground will own that when moving they are irresistibly funny. Their little wings, like fat hands without arms, round white waistcoats, short necks, and short legs with little, flat, black feet, make them like a bird edition of Mr. Pickwick. Their only movement is a series of hops, with the head bent nervously forward as if they were afraid of falling—which they are—and their little wings stuck out on each side to balance them. Of course, the penguin has not the least notion that it is

funny or amusing, and is as uncomfortable as a Chinese lady trying to walk across a rice-field. Puffins rank high among the comic birds. Their "make-up," which is that of a City waiter, is enhanced by the big red and yellow bill, which is set on like a Guy Fawkes mask. Young puffins, which have not developed this adjunct to "facial expression," are far less ludicrous to look upon, and have none of the exaggerated inspector-like air of their seniors.

The Japanese artists, who have a fine sense of the ludicrous in Nature, but usually read in some portion of human wit into their studies of animal life, show a proper appreciation of the comicality of the crab. They cast bronze crabs in all attitudes, the most effective being the enraged crab sticking up his pinching claws in a position of defence. If their mechanical skill also allowed of a clockwork movement by which the crab could be depicted retreating sideways, with his claws raised and snapping, these works of art would be perfect illustrations of the comic side of submarine life.

The element of comicality is distributed among animals of the same species in a curiously arbitrary fashion. All the bears, for instance, are comic except the polar bear, which is only amusing when taking its bath. No grown-up dogs, on the other hand, are comical except the Dutch pug, which, being fat, goggle-eyed, asthmatic, and consequential, caricatures the pig, and suggests a human being of similar tendencies. But comicality depends quite as much on action or on demeanour as on shape. The giraffe's

long neck never suggests a smile, yet from the anatomical point of view its owner should be among the most grotesque of beasts. On the other hand, there is nothing ludicrous in the appearance of prairie-dogs, yet they are intensely comic, mainly because of their exaggerated earnestness of demeanour. Their every action, whether keeping watch as sentry or collecting straw for their beds, might be labelled "Most important," and the contrast between matter and manner enhances the joke. No cat is ever comical; from the lion to the kitten they are dignified when at rest, and pretty or amusing, but not comic, when at play. Neither is the elephant; that is partly because it is not a *fat* animal, for its skin hangs quite loosely on it, and drops into folds at the joints of the limbs, and partly because it walks with great freedom, deliberation, and dignity. But little elephants, which are fat and have tight skins like a young hippopotamus, are ludicrous enough, and it is in the likeness of their rounded contours that Hindoo artists represent the jolly elephant-headed god Ganesha, the subject of endless clever comic treatment, a domestic joke in earthenware, and the Indian equivalent of Mr. Punch.

CHAPTER XXXVI

NEW NATIONAL EMBLEMS

THE old states of the world have long been represented by animals, either as the national crest or as a kind of accepted totem. The British lion, the Austrian and Prussian eagles, the Napoleonic eagles and bees, the Gallic cock, the Chinese dragon—all these are or have been part of the official insignia of nations. New nations and states have been springing up all over the world, and these, especially when of British origin, have nearly all selected an animal of some kind as the national emblem, and have made it the official crest or totem of their state. These totems are sometimes engraved on the bonds of the new communities, and in at least sixty cases are also printed on their stamps. Their selection is not arbitrary, but in general has reference to the origins or peculiarities of the new country. In many cases the bird or beast or fish is a link with the past story of the community of a very interesting kind. Their adoption, and as it were consecration, show a sentimental phase of the human mind at a time when young communities are successfully emerging from the ordeal of their early struggles. They are not as significant as the manna and rod in the Ark, or

the unleavened bread, true national emblems of particular events. But they signify something very much more than the old heraldic emblems of fortitude, strength, or pride, like the lion or the eagle or the dragon. Some are legitimate descendants of the Roman she-wolf emblem—the bronze memorial of a belief that young Rome would have perished had not the rudest forces in Nature aided its infant days. The animal which was the staple product of the colony or state in early days, such as the Canadian beaver, is a favourite choice, as the golden ram is still the totem of Leeds. Others record the existence of creatures first discovered when the colony was founded, or which especially struck the imagination of the settlers, just as the Phocæan colonists of Marseilles took the seal which followed their ships for the emblem on their coins. In almost every case the new “national animal” recalls a reference to historical events or natural products of a distinctive character, and it seems worth while to refer to them and their story while the causes of their adoption are recent.

Our oldest colony, Newfoundland, has a stamp on which is a hair seal, in memory of the sealing business which with the cod-fishing was the staple of the old North-Western trade. Not to be ungrateful to the other and more lasting source of the national wealth, the two-cent stamp has for chief bearing a codfish proper, swimming. A third issue of Newfoundland stamps shows not the trade animal, but the one which national sentiment thinks most

highly of, the large Newfoundland dog. A whole library of history might be attached to the first two emblems; from Hakluyt to the papers of the Fishery Award, in which the United States paid us £1,500,000 for infringement of our rights on these North Atlantic waters.

Some of the United States stamps are almost illustrations of national history. A large four-cent scarlet stamp shows a buffalo on a prairie with a Red Man in pursuit, and another teams of horses ready to start the self-binding reaping-machines first made for prairie use! Canada very early took the beaver for its crest, a natural and proper compliment to the animal which first invited colonists to venture there in any numbers, though whether the practical return made was of the kind the beaver would have preferred is another matter. Historically viewed, the beaver is to the insignia of Canada what the tunny-fish was on the coins of Cyzicus, a kind of advertisement of a former staple industry. The maple-leaf is the Canadian tribute to sentiment, while the beaver records "business."

Australia and New Zealand combine zoology with history on some of their stamps. New Zealand and the different governments now federalised in Australia each select a typical animal, but New South Wales adds a short historical reference. The latter colony backs up the English symbolism by which Mr. Punch and others typify the Australian Commonwealth as a kangaroo. In the issue of stamps of 1870 a kangaroo stands upright, and

over it is the significant legend, "One Hundred Years." In other words, the stamp was issued just a century after Captain Cook, on his first voyage, discovered Botany Bay and first saw the kangaroo. Western Australia takes for its emblem the black swan. This bird is almost as typical of the continent as is the emu. Some were brought to Holland before the discoveries of Captain Cook; but the black swans—once among the commonest of Australian birds, and certainly the most remarkable to European preconceptions of what was possible or impossible in Nature—used to be among the first living things seen off the coast of the continent, until the greedy sealers took to hunting the swans for the sake of their down, and killed them by tens of thousands on the sand-bars off the principal harbours.

Japan engraves the osprey on her stamps, and sometimes scenes from bird life, recalling the vignettes of Bewick on a space the size of a sixpence. Among the specimens before the writer are a stamp for fifteen sen printed in mauve, and another labelled "Wuku" Local Post. Both are engraved by native artists. The first shows a long-tailed tit searching for food in a pine branch, and the second a flight of wild-fowl alighting on the water.

But such subjects are too fine and curious for ordinary Western fancy, which likes something more solid, and occasionally is directly commercial. Thus Newfoundland in an issue of 1897, being probably either anxious to attract visitors or proud of its forests, shows

a dead cariboo deer and a leather-shirted hunter by its side, and labels this "Cariboo-hunting—Newfoundland Sport." New Zealand in her stamp designs is ornithologically inclined, possibly because more than one of her public men have been great naturalists and have written monumental works on their country's birds. The apteryx is the most interesting survival of the strange wingless fauna of the islands, and is duly commemorated on the postal issues. So is another bird, apparently a species of mynah, one which is probably well known to New Zealanders.

But by far the most interesting bird-emblem of a modern state is that of the Republic of Guatemala. It has been adopted as the national crest for so long that (partly through the taste for stamp-collecting) the existence of one of the rarest and most beautiful of the bird-creation has been made far more widely known than it otherwise would have been. There is a race of birds called trogons, most of which have very fine feathers and remarkable colouring. They are found in India and the Malays, but are most numerous in Central and Southern America. It was from their plumage that the Mexicans made their famous mosaics of feather-work; and from the tail-feathers they made the lustrous green helmets of their kings and nobles. The most gorgeous of all these was the long-tailed or resplendent trogon, which was kept as a sacred or royal bird in the palace of Montezuma, or in one of the two houses which formed the royal menagerie. "One of these houses held birds of prey only; the other birds of gorgeous

plumage. Three hundred men, according to Cortes, were employed to take care of these birds, besides physicians who prescribed for them. Of the three hundred attendants, some procured the food; others distributed it; others took care of the eggs at the time of incubation; whilst others at the proper time picked off portions of the plumage (or picked up the shed plumes), for the King was not only delighted by the sight of so many beautiful birds, but was very careful of their plumes for use in the arts for which they were needed." Adequate description of the bird is almost impossible. It has a rounded plume on the head, cascades of feathers falling from the back over the shoulders, other plumes falling over the tail a yard long, and a most elegant contour. The colour of the whole of the upper surface and plumes is a most resplendent golden green, that of the breast and under parts crimson scarlet. Such is the national emblem of Guatemala.

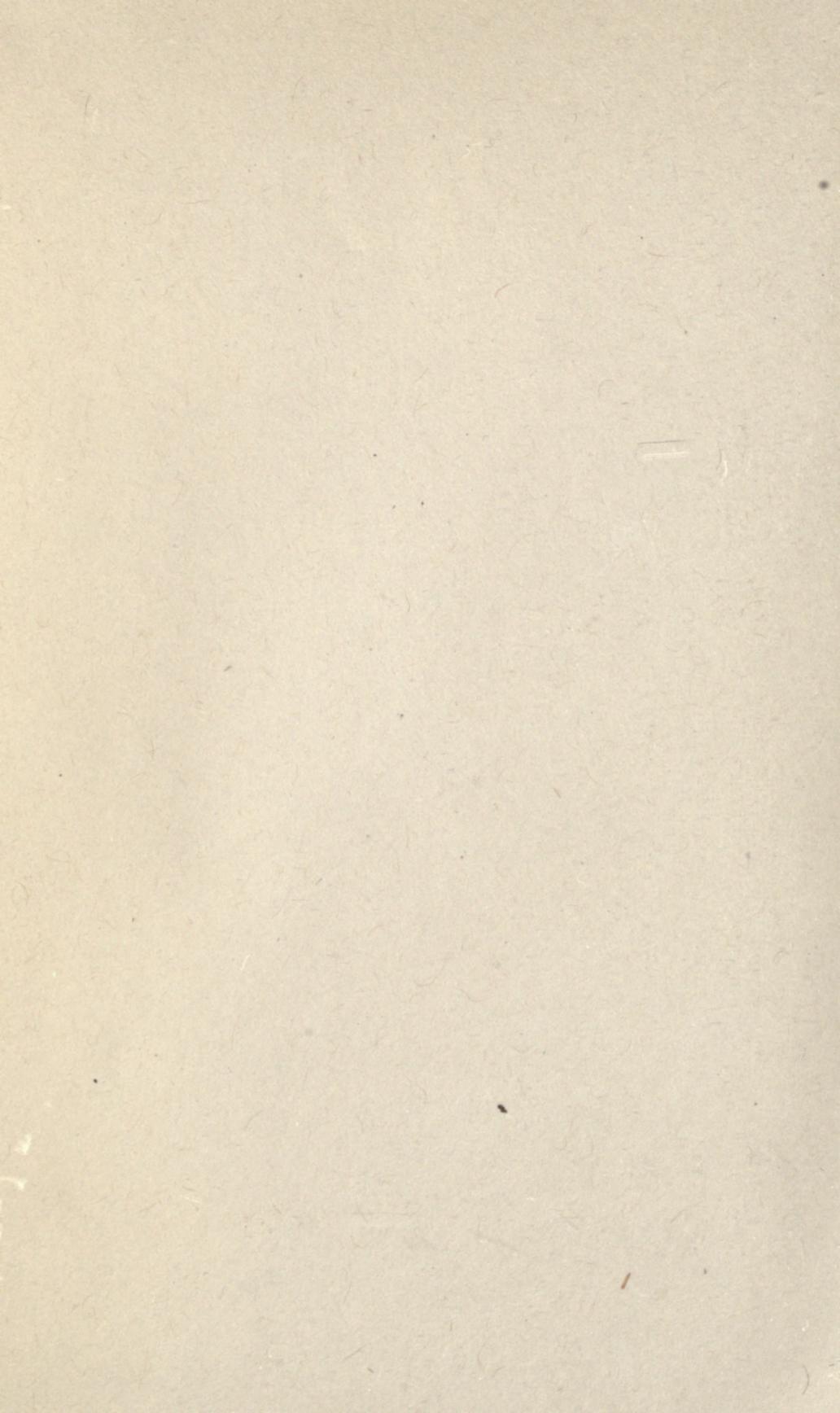
Our Indian and Far Eastern states are not at all behind the rest of Great Britain in their desire to commemorate famous natural commodities of one kind or another, but the picturesque and the terrible play a part in these devices. Pahang takes for its representative beast a tiger, either roaming or slinking through the jungle. North Borneo shows the native rusa deer, an inhabitant of its impenetrable jungles of swamp grass. The Seychelles "sport" their famous tortoise under the usual cocoa-nut palm, and the Federated Malay States a tiger bounding from the jungle. The Rajah of Travancore emblazons a device

which is variously interpreted as a sacred shell and a coiled cobra.

Time will show how many of these emblems will become permanently associated with the countries which use them on their stamps and securities. But it cannot be questioned that many of the totems are well chosen, and show considerable grace of congruity. It is public feeling which really gives currency to any of these fancies. If the greater number prove acceptable, there will be a very large addition to the zoological side of the political cartoons of the future.

THE END

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