Log-book of a fisherman and zoologist / by Frank Buckland.

Contributors

Buckland, Francis T. 1826-1880.
Royal College of Physicians of Edinburgh

Publication/Creation

London : Chapman & Hall, 1875.

Persistent URL

https://wellcomecollection.org/works/wehzwpvs

Provider

Royal College of Physicians Edinburgh

License and attribution

This material has been provided by This material has been provided by the Royal College of Physicians of Edinburgh. The original may be consulted at the Royal College of Physicians of Edinburgh. where the originals may be consulted.
This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.

wellcome collection

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

Cad. 15

R31814

LOG-BOOK

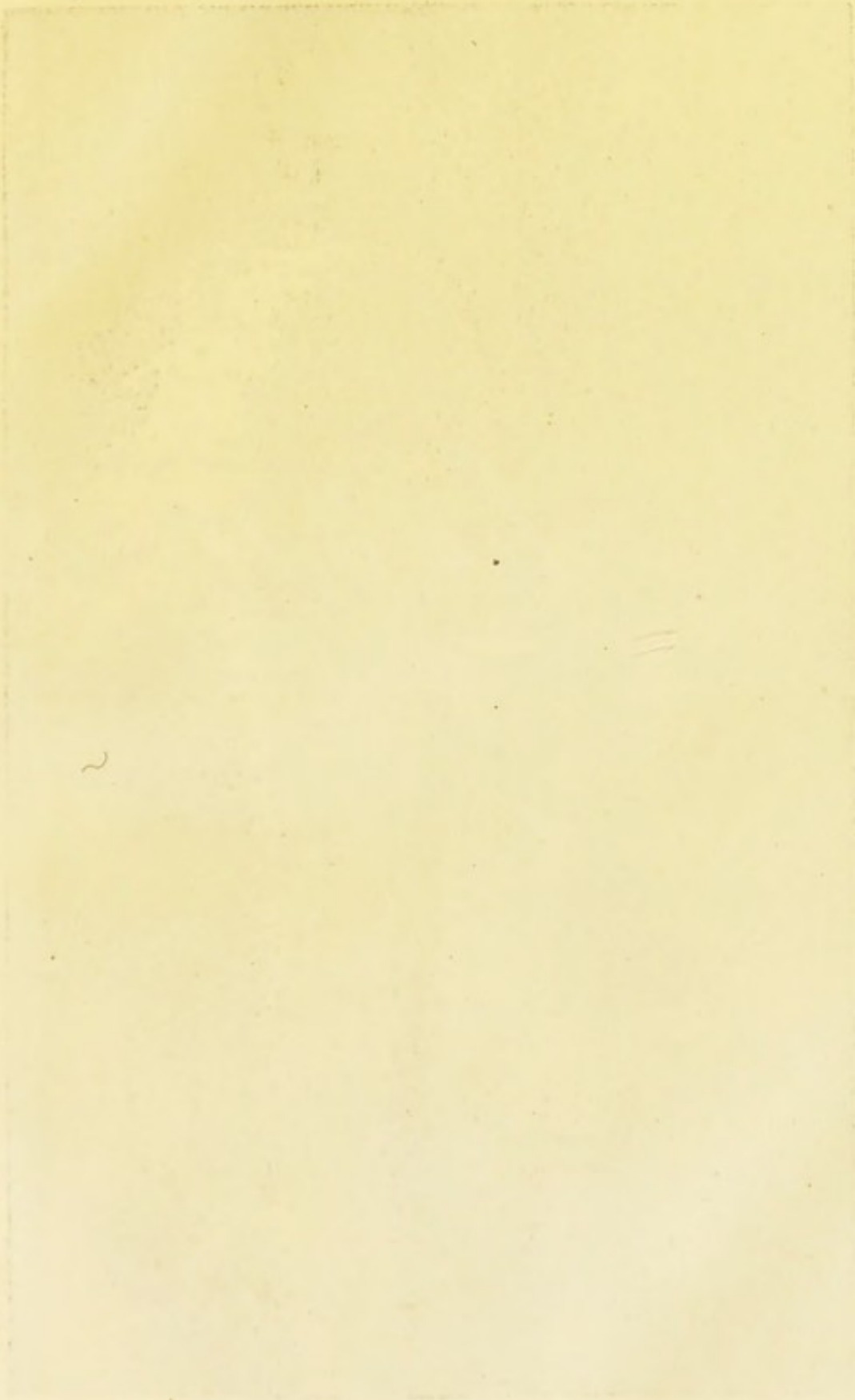
OF A

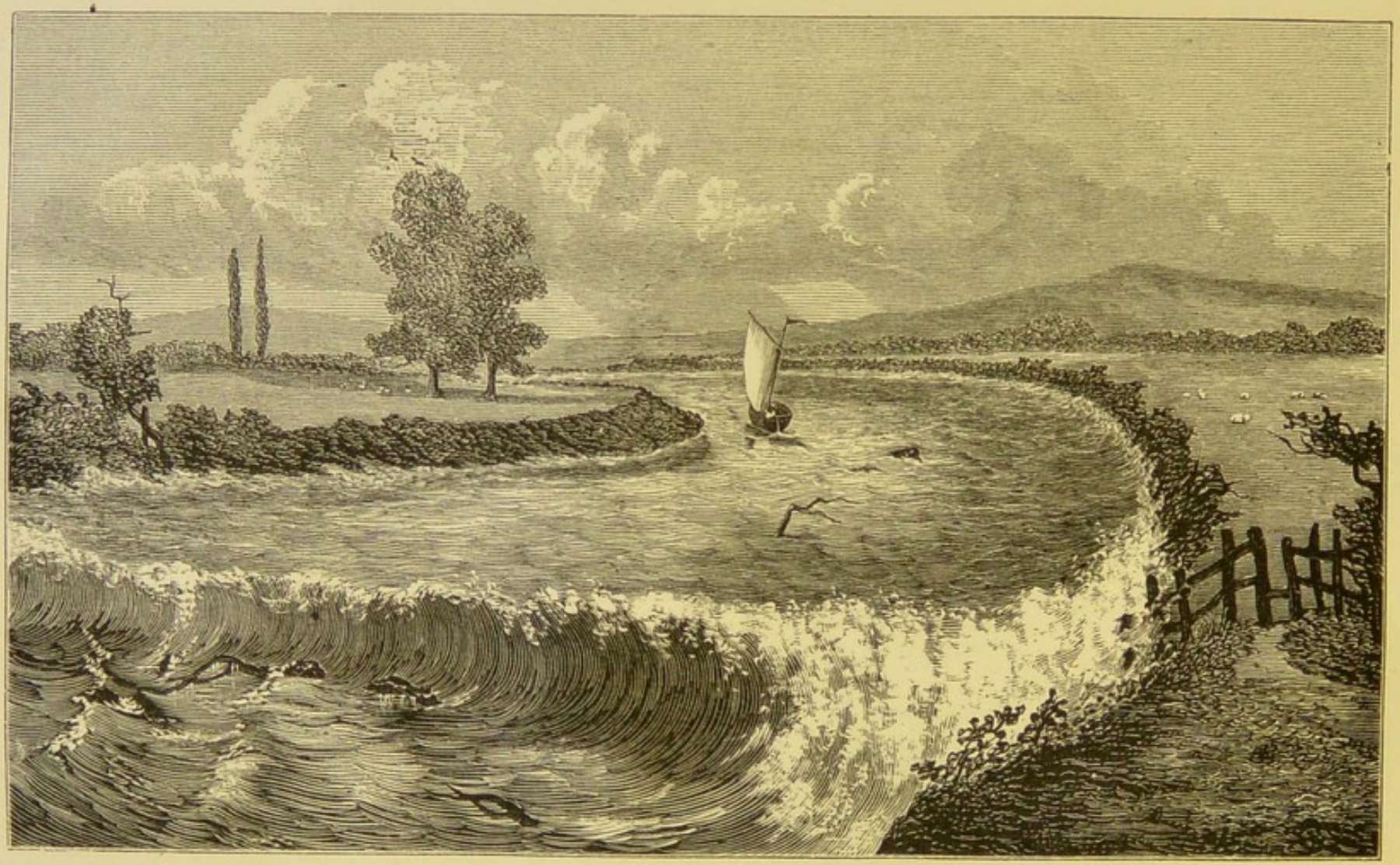
FISHERMAN AND ZOOLOGIST.



Digitized by the Internet Archive
in 2015

https://archive.org/details/b21930648





THE BORE ON THE SEVERN. [*Frontispiece.*

LOG-BOOK

OF A

FISHERMAN AND ZOOLOGIST

BY

FRANK BUCKLAND, M.A.,

LATE STUDENT OF CHRIST CHURCH, OXFORD;

INSPECTOR OF SALMON FISHERIES FOR ENGLAND AND WALES,

ETC., ETC.

ILLUSTRATED.

LONDON:

CHAPMAN & HALL, 193, PICCADILLY.

1875.

[*All rights reserved.*]

LONDON :
BRADBURY, AGNEW, & CO., PRINTERS, WHITEFRIARS.

THE AUTHOR

DEDICATES BY PERMISSION

This Book

TO

HIS ROYAL HIGHNESS PRINCE CHRISTIAN,

OF SCHLESWIG-HOLSTEIN, K.G.,

RANGER OF WINDSOR GREAT PARK, ETC.,

IN TOKEN OF GRATEFUL APPRECIATION OF THE EFFORTS OF

HIS ROYAL HIGHNESS

TO

ENCOURAGE KINDNESS TO ANIMALS

AND TO ADVANCE THE

SCIENCE OF PRACTICAL NATURAL HISTORY.

PREFACE.

At all times the faculty which is most useful is that of quick and accurate observation of truths both small and great.

Inanimate objects, though voiceless, are, in my experience, most valuable witnesses to truths both current and past.

My good Father and Mother trained me well in observation, note-taking, and reflection; it has therefore become my habit to observe, record, and reflect upon everything I see in town or country, out of doors or indoors; and, as a Philosopher of old wrote of himself, so I am thankful to say I can write of myself, "Nunquam minus solus quam solus." The results of some of my observations are recorded in the following pages.

An immense amount of valuable practical knowledge lies unutilized in the minds of those of the humbler classes who have neither the ability nor the opportunity

of expressing it in writing or in print. Good folks of this class have often a quaint mode of diction and a store of good old English words, which it is my delight not only to listen to, but also "paper"—as they have it. It is therefore with glee that I delight to talk to my friends "Robinson Crusoe," p. 62; "Charley Hill," of the smack Hurricane, p. 79; "Old Tom," the custodian of the Duke of Marlborough's Emus and Kangaroos, p. 47; the "Whitstable Diver," p. 132; the "Blind Man," owner of Puss, p. 110; "Mother Pook," p. 181; &c.

I write most of my articles (especially the long ones), in railway trains. My Official duties as Inspector of Salmon fisheries, with my friend and colleague Mr. Spencer Walpole, necessitate frequent and long journeys, as we have to look after thirty-eight fishery districts, from the Coquet in the North to the Fowey in the South. During the otherwise tedious railway journeys I always do a great deal of writing. Going north I post my MS.,—begun at Euston or King's Cross, and written during the journey—at York, Newcastle, or Carlisle; and when going in other directions I post at Salisbury, Exeter, Gloucester, Worcester, Shrewsbury, Canterbury, or Chester.

Thus, a railway carriage to me becomes a most agreeable studio where I can write without fear of being

called upon to attend to other matters, while the cold-air bath, as the Express rushes along, invigorates the memory and renovates the mental powers. The articles which my friends tell me are my best are generally written in the railway train.

My Father taught me to write in a railway carriage, and the late lamented Bishop of Winchester (then Bishop of Oxford) taught him ; and I have passed on this valuable mode of saving time to many friends and acquaintances, as well as to fellow-passengers during my journeys.

Most of the articles in this book have been published in "Land and Water," and, holding the copyright, I now republish a selection from them in a collected form. I am indebted to "Land and Water" for the loan of several of the blocks. I have to thank "Temple Bar" for allowing me to republish "My Monkeys," * and to Sir W. Fergusson and Messrs. Churchill I am obliged for the

* It is but fair to my monkeys, "The Hag" and "Tiney," to state that many stories I have written about them in this book refer to times past, when Tiney was young, and the Hag amenable to discipline. I can now give them their liberty no longer, as the Hag has in her old age become very cross and inclined to bite, and Tiney must not be trusted out loose alone. I have lately found out by accident that my study, where I and the monkeys have sat together so many years, which was formerly called by the servants the "Master's room," is now designated by them as the "Monkeys' room." This is Darwin going backwards.

loan of the blocks of the cocks with spurs in their combs.

"Land and Water" was originated nine years ago by the late Mr. W. Ffennell, Mr. Chapman, Mr. Higford Burr, other gentlemen, and myself; Mr. Henry Lee, and other valued correspondents speedily joined us. Since its origin, I have been and still am Editor of the "Fishery" and "Natural History" columns.

It is a difficult task, month after month, year after year, to find a fresh subject for every Saturday's paper. I have, however, the satisfaction of knowing that many fishery and natural history subjects, first started by myself, have led to debate and the diffusion of otherwise latent knowledge. See especially the correspondence in my articles, "Bore on the Severn," "Eagle and Child," "Tartarian Lamb," &c. I here beg to thank my numerous correspondents for the trouble they have taken to join my ranks. My private secretary, Mr. Searle, has been of great service to me in all matters relating to my writings, as well as casting and painting salmon and other fish for my "Museum of Economic Fish Culture" at South Kensington, of which Mr. Edon takes every care.

As an undergraduate at Christ Church, Oxford, and also

when in my Father's house at the Deanery, Westminster, the pleasant and learned society which I had the privilege of enjoying trained me up in the good old school of the Bridgewater Treatises, the seven volumes of which were written by the most eminent men of that day to show the "Power, Wisdom, and Goodness of God, as manifested in the Creation."

I therefore hereby declare myself to be a staunch upholder of the school, instituted by these good and learned men.

The so-called education of the present day is, in my opinion, too much confined to book-learning, and taking for granted the ideas and opinions of others. If I had my will I would educate the eyes of all—adults even more than youths and girls—to observe and to photograph objects in their head. I would also teach them to use their fingers to analyze and draw, and above all to dissect, Beasts, Birds, and Fishes, so as to be able to understand their wonderful structure and mechanism, and the handiwork of the great Designer of all things. Horace never wrote a truer thing than

> "Segniùs irritant animos demissa per aures,
> Quàm quæ sunt oculis subjecta fidelibus."

I do not bow to many of the teachings of the modern

school of science, which often, by hard words and unnecessary mystifications, frequently seems to puzzle rather than enlarge the mind. I wish, on the contrary, to throw the portals of Science, (*i.e.* knowledge,) wide open, and let all enter who will; we want as many recruits as possible in our ranks. It is hardly necessary to say that I am not a disciple of Darwin or the development theory. I believe in the doctrine—I am sorry to say now old fashioned—that the great Creator made all things in the beginning, and that he made them good.

FRANK BUCKLAND.

37, Albany Street, Regent's Park, London,
April, 1875.

CONTENTS.

	PAGE
AT THE ROYAL ACADEMY WITHOUT A CATALOGUE	1
SIR EDWIN LANDSEER'S FAVOURITE RED SPOT	13
EXHIBITIONS OUTSIDE THE CATTLE SHOW	17
KING CHARLES THE FIRST'S PARROT	29
FOOTSTEPS IN THE SNOW AT THE ZOOLOGICAL GARDENS	32
ICE ACCIDENT TO THE RHINOCEROS	39
MOUSE BURR FROM HORSE'S TAIL	42
EMUS AND KANGAROOS AT BLENHEIM PALACE	47
HEAD OF INDIAN FROM SOUTH AMERICA	57
AN OLD MAN OF WAR'S MAN, ROBINSON CRUSOE	62
HORSE-FLESH DINNER AT THE LANGHAM HOTEL	72
FOOT OF NAPOLEON'S CHARGER	76
FISH AT GREAT GRIMSBY DOCKS: EXPERIENCES OF A NORTH SEA TRAWLER	79
"LITTLE JEMMY" THE SURICATE	96
RAT WITH HAM-BONE ON HIS NECK	101
SINGING MICE	103
LEADEN PIPE GNAWED BY RATS	105
"PUSS," THE BLIND MAN'S DOG	110
USE OF THE GULAR POUCH OF THE BUSTARD	118
DINNER OF AMERICAN GAME AT THE LANGHAM HOTEL	123
EXPERIENCES OF A WHITSTABLE DIVER	132
FIGHT BETWEEN A SCORPION AND A MOUSE	139
THE WOODPECKER AND THE BITTERN	144
NETTING THE FISH IN THE SERPENTINE	151
TARTARIAN LAMB	163
OUT SNAKING	168
SNAKE WITH TWO HEADS	178
HOW I SPENT WHIT-MONDAY AT HARTING	181

PAGE

THE BRIGHTON AQUARIUM 193

REMINISCENCES OF NATURAL HISTORY IN SCOTLAND :—

SCOTCH RED DEER 219

SCOTCH WILD CATS 243

WILD CATTLE FROM HAMILTON PALACE 255

GOLDEN EAGLE FROM SUTHERLANDSHIRE . . . 261

WILD GOATS IN SCOTLAND 270

SCOTCH RIVER PEARLS. 272

INJURY TO A SUBMARINE TELEGRAPH CABLE BY A FISH, IN THIRTY FATHOMS OF WATER 275

"JEMMY" THE WALRUS 280

THE "ECLIPSE" WHALING AND SEALING SHIP 295

BARNACLES FROM A WHALE 302

THE GREENLAND SEAL FISHERIES 306

THE BLADDER-NOSED SEAL OF THE ARCTIC SEAS 315

HABITS OF THE FUR SEAL 318

MY MONKEYS :—"THE HAG" AND "TINY" 324

"THE HAG" ON DARWIN 336

THE ANDAMAN MONKEY 341

MONKEY TRAINING 345

THE BORE ON THE SEVERN 346

TITLES OF DUMMY BOOKS FOR A LIBRARY 369

ANTIQUITIES :—KING ALFRED'S JEWEL 372

EXECUTION AXE 374

COLLAR OF BLACK PAGE 377

JOHN HUNTER REVIVED 378

LIST OF ILLUSTRATIONS.

BORE ON THE SEVERN . . . . . *Frontispiece.*
SKELETON OF KING CHARLES THE FIRST'S FAVOURITE PARROT . . 30
MOUSE BURR FROM HORSE'S TAIL 43
HEAD OF INDIAN FROM SOUTH AMERICA 58
BEAR'S FOOT 75
LEADEN PIPE GNAWED BY RATS 106
BUSTARD WITH POUCH EXTENDED 120
TERRAPIN WITH OYSTER SHELL ATTACHED. 125
FOSSIL ELEPHANT'S TUSK FROM OYSTER BED . . . *to face p.* 137
OLD SWORD FOUND IN THE SERPENTINE 161
TARTARIAN LAMB 163
DOUBLE-HEADED SNAKE 179
CROMMY ANTLERS FROM JURA 228, 229
TELEGRAPH CABLE AND TOOTH OF SAW-FISH 275
"JEMMY" THE WALRUS . . . . . *to face p.* 289
CLUB FOR KILLING ARCTIC SEALS 296
HEAD OF PIKE WHALE 301
PARASITIC BARNACLES FROM HEAD OF WHALE 303
HEAD OF BLADDER-NOSED SEAL 317
"JENNY" THE ANDAMAN MONKEY 343
SALMON PUTCHER AS USED IN THE ESTUARY OF THE SEVERN . 367
SALMON PUTT 368
KING ALFRED'S JEWEL . . . . . *to face p.* 373
EXECUTION AXE 375
SLAVE'S COLLAR 377
COCK'S SPUR TRANSPLANTED INTO HIS COMB 389
COCK WITH SPURS GROWING IN HIS COMB 390

LOG-BOOK

OF A

FISHERMAN AND ZOOLOGIST.

AT THE ROYAL ACADEMY WITHOUT A CATALOGUE.

After giving evidence before the Committee of the House of Commons on the Salmon Bill—now happily become law—I went one fine afternoon in May, 1872, to the Royal Academy, as I thought I would try an experiment to see how far the Painter's art could convey what he really meant *without* the interposition of a printed description. So I bought *no* catalogue, and thoroughly enjoyed myself examining the pictures, especially as I am teaching myself to paint my fish casts, and like to learn.

Not many of the pictures—I am sorry to say very few—tell their own story; but some do. The gem of the collection, in my idea, was a picture representing an old grey-haired man, with his hands tied behind his back, standing in front of three Lions and four Lionesses. The beasts are evidently very hungry, and they have slain and eaten a man not very long ago. There is a blood-stained spot on the ground, and I see a human

femur (left side), a right tibia, a left humerus, and a bit of the pelvis, lying about. A bit of a scapula has flesh still upon it. All the bones are human. *Why* don't these savage and starved beasts instantly fly upon and kill this poor old man? Look at that three-year-old lion coming round from behind the others; a sneaking, cat-like, but magnificent beast, worth £200 at least to our friend Jamrach, the animal-dealer. Look at that old Lioness snarling and showing her awful teeth and spine-covered tongue, and the old Lion licking his quivering be-whiskered lips. What is that curious light falling full and glorious upon the man? It is not natural, it is not the light of the sun or the moon, nor is it the electric light. By Jove! I see. It is "Daniel in the Lion's Den." Splendid—grand. I congratulate the artist.

A great big picture, representing a very thin, tall lady in the costume of Eve, chained to a rock by her wrists. How in the world could this come about? I don't see ladies in this garb tied to rocks in my Salmon inspection expeditions. A nondescript beast, meant, I suppose, for a Dragon, and an idiotic-looking young man stabbing the dragon. The dragon very bad indeed—head with scales something like a turtle, and teeth in its mouth that are neither those of lion, tiger, hyæna, wolf, bear, or seal.

The young man must be an idiot. Fancy going out to fight a dragon with pigeons' wings tied to one's ankles—see picture—and with bare legs, like a Highlander! The young man*—he is neither an anatomist nor a butcher—

* This same young man re-appeared in the Exhibition, 1873, dragon-hunting again. This time he had gone home and put on a suit of armour.

has thrust his sword—not a scientific-looking weapon at all—a few inches into the dragon's mouth, just inside the ramus of the left lower jaw. The wound would not hurt the dragon a bit. It would simply transfix his parotid gland, if a dragon has a parotid gland. The sword would run well clear of the carotid arteries, and certainly would not touch the beast's aorta, or heart. This is not the way to kill a dragon. I wish somebody *would* kill a dragon and let me cast it.

If I wanted to kill a Dragon, I would set a Scotch "stake" or "fly" salmon net for him, or else get my friend Captain Gray, of Peterhead, to come with his whale steamship *Eclipse* and a boat's crew, or two or three of his Peterhead whale-harpooners. We would soon polish off Master Dragon, I know. I must not forget the dragon's blood in the picture. I long to dip a microscope slide into it. I wonder what the corpuscles would be like.

Another big picture, a huntsman holding up a fox among his hounds—not painted by a sportsman. The hounds are not—in the picture—kicking up that delightful "*tapage infernal*" so dear to the fox-hunter; nor is the huntsman crying out "Yoicks! tear him, my beauties!" The huntsman's boots are covered with mud; the Master's boots are quite clean, or nearly so; the huntsman's horse ought to be covered with foam, and just shaking himself with the peculiar shiver due to his having that curious subcutaneous skin muscle—the *paniculus carnosus*. He is doing nothing of the kind. The fox is a Billingsgate or tame kennel fox. Who ever saw a hunted and beaten fox with clean fur like a lady's muff? Two or three of

the hounds have blood on the tip of the tail. They have been drawing a gorse cover, I suppose. A gentleman riding up in the distance, and the "whip" behind him, both with solemn faces and clean horses, and not the least in a hurry. They ought to be wild with excitement.

As contrast, good hounds in full cry—one can hear them—racing across a ploughed field, the huntsman this time at work, and one hears "Forrard! Hark forrard!" and the ringing cry, "Gone away!" A pair of plough-horses running away with a plough to which they are harnessed and getting among the hounds—good. In another second the plough, now jumping about on its sides like an india-rubber ball, will stick with its pointed end into the "ridge and furrow," and the horses will come a terrific smasher on to the ground.

An aristocratic-looking, intelligent-faced man, standing behind a tree with a cross-bow in his right hand; his left hand keeps back some boughs so as to allow a very pretty young woman indeed to shoot at something that is coming. The lady also has a crossbow. I see it's King Harry the Eighth. I know him from his portrait in the hall at Christ Church, Oxford. Bless his memory! I owe my education to his noble foundation. Who is the Lady? I don't know. I have forgotten my history, and even if I had not I should not know, the great king had so many wives. At all events, he has found an awfully pretty one this time. I hope she will shoot the stag for which she is evidently waiting, but she looks too kind-hearted to want to shoot a stag. The king has evidently brought her out to please her with

sport. He thinks she enjoys it, but I don't think she cares much about it, and if I read her face right, she wants to go home to her four o'clock cup of tea—only tea was not invented in the glorious Harry's time.

A river—the Tay I swear, from the scenery; a love scene—I don't admire the Highlander's taste; might have found a prettier Scotch lassie; a mill leat—don't see the weir nor the "byewash" of the mill; a coble anchored—no net in it, not "travelling water" for Salmon. The Highlander, smoking—if a fisherman—would tell me, "She 'ill na fash the day, sir." Sir Robert and the Duke and other "Upper proprietors" above will do nothing with the rod to-day, but the "stake" and "bag" nets in the sea will "fish well" if there comes on the proper wind at sundown. I wish the artist would draw us a salmon-fishing scene. I could give him lots of subjects.

Another water scene—by the same hand, I think. A miller's lad, white with flour, going to angle. He will catch nothing here but small trout, and I think he must be baiting with a worm. I should, if I were he. This lad will gaff and spear spawning salmon next November. I know he will from the look of him. The Salmon will spawn or attempt to spawn in the mill tail, where there is no salmon pass, but yon lad will take the salmon spear from behind the sacks in the mill, and ignore the 17th section of the Salmon Act 1868, of which probably he has never heard, but with which he would soon become acquainted, if some of my friends the Scotch water-bailiffs came about. "Flowing to the River," says somebody near me. A very pretty picture.

A young man holding a wolf's head high up in the air;

an old man carrying five wolves' heads slung over his back. I cannot see in the picture how the wolves' heads are fastened together. If I had the job, I should have passed a rope through the bones of the lower jaw at the tip of the tongue. A third man leading two hounds. I doubt if they are the right kind of wolf-hound, but the painter may have authority for the kind of dog. In a picture which I saw at Beddgelert, North Wales, illustrating the old legend of the poor baby saved from wolves by a hound, the hound is the same as in this picture. The hounds are much too clean: they don't look as if they have been fighting with wolves. If I had painted this picture I should have made the hounds with blood about their chaps, and one of them certainly going on three legs from a bite in the fore paw. When hyænas fight they always tuck their paws under their bodies, if possible, and knowing dogs will do the same—a dog's paw, like a nigger's shin, is the tenderest part. The country is like that seen from the end of the Long Walk at Windsor—a very likely place to find a wolf. A hunted anxious-eyed wolf in the distance looking out of the cover, and thanking his stars that the hounds and huntsmen were gone away, would have been an improvement to the picture. I think the painter means to indicate the time when one of the Kings of England demanded the taxes should be paid in wolves' heads. There is a corner of an old wall which I well remember, part of the outskirts of Winchester Cathedral, that once formed a portion of the buildings of Wolvesey Castle. When a boy at Winchester School, I always had a longing to go and dig up this place —this longing still remains—as there was a legend

that the wolves' heads paid as taxes were all buried at this spot. Remembering this legend, I at once pronounced the picture to represent our ancestors collecting wolves for the taxes. Very good; the painter shows in his drawing what he means.

A North American Indian sitting quite alone on the prairie. If the painter has not actually been on an American prairie himself, he has taken the scene from a wonderfully effective plate in Catlin's "North American Indians." Something wanting to interpret the picture. Let's see the details. A pair of deer-horns behind the man (deer horns right for a wonder—*Cervus Virginianus*); a quiver full of arrows—the man had not been hunting, or there would have been fewer arrows in the quiver; bow, I believe right; a fire three parts out; logs of wood much too big—I don't see where the Indian could have got such big logs of wood on a prairie. The man is ill—I don't think he has had an accident, certainly not a fracture of a bone, or he would be looking at, or attempting to support, the fractured limb. He has some internal disease, possibly peritonitis—a man with peritonitis could certainly not ride. Other Indians in the distance are going away at a pretty fast pace. I suppose they are going for the doctor. The man's loose horse following after the Indians. It would have been more poetical if the painter had made the horse appear unwilling to leave his master, thus shaming the men. I peep at a catalogue of some one near, "Left to Die" is the name of the picture. Poor Indian! I wish I was there with my medicine chest or surgical instruments, I would try to cure him. He can't be so very bad after all, or he would be lying down.

Three young Ladies playing at cards, one young lady showing the cards she has in her hand. I don't understand cards, but I suppose this means something intelligible to card-players. Dresses wonderfully painted, also the heavy gilt metal handles of the card table. I looked to see how it's done. I find the paint is put on very thick, in, as it were, little knobs—a fine hint for me. At a proper distance, I seemed inclined to take hold of the handles and open the drawers; I wonder what's inside them. Evidently three sisters, very much alike, but not one sister I see has earrings. How am I to know them apart, as their dresses are perfectly alike? I see—one has on a necklet, with two rows of pearls; a second a red velvet, and the third a black velvet necklet. I believe the hansom cab I was in the other day going to my Office, nearly ran over these very three young lassies —I beg your pardons, pretty Ladylike creatures! To get the full effect of the fine picture, the spectator must stand about eight yards away, and the effect is magnificent. I expect the artist must have painted with a brush about eight feet long, working upon a swivel like a duck-gun. I wonder what he would think of this idea. It's not a bad one, I am sure. I shall try it myself.

A fishing smack just come to an anchor. An old fisherman landing his fish—scenery like the coast at the north of Berwick-on-Tweed. The fisherman has got a very miscellaneous lot of deep-sea fish—skate, john-dory, ling, conger, plaice, gurnard, &c. He must have been working both "long lines" and "trawl-net," as some of these fish are caught *only* by the trawl, others *only* by the long line. The painter is not a deep-sea fisherman. The

basket of fish is put into scales. They don't sell sea fish like this by weight. Fish nicely done. I wish the painter would touch up some of the casts which I have painted.

An animal, I suppose meant for a red deer, wounded—a bullet-wound on the left side. A wound at this part would not bleed much, because the scapula would act as a valve to keep the blood inside the thorax; and yet there is no end of blood. A miserable production, and as far as the animal goes not fit for a public-house sign. The rest of the scenery good.

A magnificent lion—Sir Edwin of course. But lambs like this do not live in countries where lions are found, except menagerie lions. An eland, giraffe, or quagga, would have been better company for a wild lion. It is evidently a lamb, for his tail has not yet been docked. The attitude of the lion's paws is a great improvement on the Charing Cross lions. These lions have their paws stretched straight out like a greyhound dog. Cats and lions (lions are nothing but big cats) turn their paws inward when lying down quiet. A fine picture. Sir Edwin can paint animals, and no mistake; but why so much red inside the lamb's ears?*

My friend, Mr. T. Sopwith, tells a good story. An artist received a commission to paint a scene of a shipwreck, and painted some *red* lobsters among the rocks on the shore; as everyone knows, lobsters do not turn red till they are boiled. The same painter received an order to paint a river-scene; not being able to get on without a bit of red somewhere in the foreground of his

* See article "Sir Edwin Landseer's favourite Red Spot," p. 13.

picture, he painted a bunch of carrots floating down the river—but carrots don't float.

And now I must wind up with a description of prize picture No. 2, in my humble opinion. Time of Napoleon's wars—the uniform tells us that; a half-burnt and deserted village; an old peasant—probably the mayor of the village—sitting by the side of a well with a mug in his hand; a cavalry officer with a flint pistol, cocked, and pointed at the old man's head. The officer very like Colonel ——, a friend of mine, and a determined fellow. The officer says to the old man, "Drink instantly, or I will shoot you dead." The old man does not really know whether the well has been poisoned or not, but he strongly suspects his son, or some one else, has put poison into it. A regiment of French soldiers are coming up to drink. They look thirsty. A blood-stained cavalry soldier is drawing again from the well. The old man does not know what to do or say; he has one eye on the glass, the other is looking up the pistol-barrel, so close, so very close to his venerable head. Spare the poor old man, Officer! Spare him; do, pray! If the well *is* poisoned, the old man did not do it. Never mind, let's paint a second picture! The old man bravely drinks the well-water. It is *not* poisoned—no such dastardly tricks. The tired soldiers quench their thirst, and the Officer marries the old man's pretty daughter, and all is happy.

I cannot resist republishing the following criticism on the pictures at the Royal Academy, from the pen of my friend George Rooper, Author of "Flood, Field, and Forest," and a great sportsman.

"Walking through the Burlington Arcade I stumbled

on a notebook from which the following extracts are taken. They are evidently the work of a penny-a-liner, intended for publication in some country newspaper, and betray the most lamentable ignorance of art on the part of the writer. As you will observe, there is not even a reference to light, shade, depth, breadth, tone, colouring, composition, or effect throughout, and I am convinced he has no more pretensions to the name of a critic than has, Sir, your most obedient servant,

"PAUL PRY.

"'Perseus and Andromeda.' The artist forgot that Perseus was *invisible* at this particular juncture. We could have wished he had remembered, and acted on, the knowledge, and left Perseus to imagination.

"'Wanted, a Partner.' We are not sure we have got the title of this picture, or the number, exactly correct, but it is that of which Mr. Buckland remarked that 'the further you were off it the better it looked.'

"A creature crawling up a rock. Is it a lizard? No! A weasel? Guess again. A phalanger? We have seen one in the Zoo. No! give it up, and refer to the catalogue. Lo, it is *a fox!* It was the first time, we are told, the fox had ever seen a lion, and was much astonished. The astonishment is mutual, it was the first time the lion had seen *such* a fox—we trust it may have been the last.

"'The Huntsman' is plainly throwing himself to the dogs, as well as the fox; we defy him to recover his balance and save himself. We are utterly unacquainted with hunting minutiæ, but we have read somewhere, in

one of Mr. Freeman's sporting works, perhaps, that the fox, before he is thrown to the hounds, is 'divested of brush, pads, and mask,' but perhaps that author, although an enthusiastic sportsman, is in error. Will some of our hunting correspondents enlighten us?

"We know no more of racing than of hunting, but we had no notion that jockeys took the matter so easily. 'Blue Wins'—no doubt he will. The artist says so, and he ought to know; there is no reason on earth why he should not—or should.

"'Allegorical animals.' Some one near us suggested that the 'lang-nebbit' creatures were intended for Lambs. We would not do the artist the discredit of supposing so."

If I have offended any artists, I hope they will forgive me, but they really should observe nature more. After all, what I have written is only fun, you know.

SIR EDWIN LANDSEER'S FAVOURITE RED SPOT.

It will be recollected that a question has been raised in the columns of Land and Water whether our great painter, Sir Edwin Landseer, was or was not correct in painting a drop of blood on the broken brow-antler of a red deer in his celebrated picture of "Deer Fighting," which is now at Dunrobin Castle. My opinion is that although an old horn would not bleed, and a young horn (from which the velvet had lately been absorbed) *might bleed*, yet Sir Edwin put on this bit of red at the tip of the broken horn simply to set off the rest of the picture.

In March, 1874, I went to see the collection of Sir Edwin's pictures at Burlington House, and while examining them, it all at once struck me to find out whether the artist had put his "bit of red colour" into any of his other pictures. I went rather hastily round the galleries first, and then, thinking I had found what I wanted, I made a more careful inspection, with, I think, the satisfactory result—that Sir Edwin purposely introduced "his favourite bit of red" into nearly all his pictures; and it will be seen from what follows to what

curious shifts and contrivances he has been sometimes put for the sake of this. Thus we find, "Charles Sheridan"—red pattern on a child's drum, and red sealing-wax on a letter on the floor. "Shepherd's Home"—baby's lips abnormally red. "Prosperity"—red roses. "Adversity"—red flowerpot. "Dash and Lion"—red tuft to hawk's hood. "Dandie and the Hedgehog"—red poppies. "H. R. H. the Princess Royal with Pony and Dog"—red halter to pony. "Brazilian Monkeys"—a pineapple. "The Twins"—red cloth. "Highland Cairn"—red coal in the fire. "Pair of Nutcrackers"—breast of bullfinch red. "Sick Monkey"—an orange. "Otter Hunt"—red huntsman's coat and tongue of otter. "Laying Down the Law"—red back to chair on which dog is sitting. "Van Amburgh and his Lion"—Van Amburgh's red velvet cap and foot-soldier's coat in the distance. "Van Amburgh and his Lions" (another picture)—play-bill printed in red letters, and bouquet with red flowers. "Chillingham Bull"—red inside nostrils. "Bolton Abbey in Olden Time"—red spots on trout, red wine in bottle, and a red coat. "Refreshment," and also "Horses and Dogs"—red carrots. "Dead Game"—red markings over pheasant's eye. "Random Shot"—blood on snow. "Polar Bears Discovering Relics of Sir John Franklin"—bears tearing at a red flag half-buried in snow. "Life in the Old Dog yet"—dog's tongue red. "Hunted Stag"—blood in mouth. "Godolphin Arabian"—red bricks of stable wall, and red hoops to stable-bucket. "Titania and Bottom"—red wreath on ass's head. "Flood in Highlands"—duck's legs, cow's nostril, ribbon round man's cap all red. "Arab Tent"—stick ends burning

red. "Cover Hack"—red handle to scraper, and red flower pot. "Sutherland Children"—red flowers in garland, boy with plaid stockings with red markings. "Boz"—blood in rabbit's mouth. "Earl and Countess of Sefton"—red riding-habit. "Dogs and Parrot"—red feathers of bird, and sealing wax. "H.M. the Queen"—red handle to riding whip. "H.M. the Queen at Loch Muir"—red flag, red on gills of fish. This fish is neither grilse, salmon, nor trout: if meant for either, the fins are wrongly placed, and there is no adipose fin. If poor Sir Edwin had been alive I would have chaffed him over this. "Ptarmigan"—red eye contrasted with snow. "Lion and the Lamb"—inside of lamb's ears red. "Sir Francis Chantrey's Studio"—red cloth on table. "Horses at Fountain"—groom's red coat, woman's stockings. "Little Doggie and Looking-glass"—red paint in saucer and painter's brush by it. "Fairy, a White Horse"—edge of blanket red. "Partridges"—blood from broken wing. "Not caught yet"—blood near rabbit-trap. "Baptismal Font"—red inside lamb's ear. "Otter and Salmon"—blood on salmon's gills and on wounds of white skin between pectoral and abdominal fins. I don't think this part of the salmon (being mostly fat) would bleed much. "Sin Offering"—lighted ashes blown upwards from fire about to burn up the scapegoat. "Travelled Monkey"—monkey has a red coat. "Deer Family"—red inside deer's nose. "Highland Nurses"—stag's tongue red. "Badger, Dog and Monkey"—orange-peel and red coat. "Loch Laggan"—Highlander's red kilt. "Donkey and Thistle"—red about donkey-bridle. "No Hunting till Weather Breaks"—huntsman's coat, and red feathers on

breast of a robin. "Sir Walter Scott"—red pocket-handkerchief, red on cap and in corner of dog's eye. "Voltigeur, winner of the Derby"—red binding to horse-cloth, horse's nose red, cat's nose pink. "Beauty's Bath"—red sofa, and red rose floating in the bath. "The Dog Countess"—red feathers on cock's neck, and dead rat's wound bleeding. "Highlander with Eagle"—the man's face and hair are red. "A Trophy"—hawk's hood red. "Duke of Devonshire as a Knight"—red plume to helmet. "Grouse"—blood from broken wing. "Skye" and "Saved"—red on stones *apropos* to *nil*. "Swannery Invaded by Eagles"—lots of red blood everywhere, showing up white plumage of swans. Last, but not least, "The Connoisseurs"—Portrait of Sir Edwin Landseer himself, presented by him to the Prince of Wales. Here we have the great animal painter with canvas before him; two noble dogs are looking over his shoulder in the attitude of criticising the growing picture; and now mark, *Sir Edwin has a crayon-holder in his hand, and in the reverse end, which is not in use, is inserted a red crayon.*

I trust that this crowning fact, together with those above mentioned, will induce my readers to agree with me, that the "red spot" in Sir Edwin Landseer's pictures is no accident, but rather a favourite device, frequently, nay, almost always, used by him, the value of which, to set off a picture, no one knew better than himself.

EXHIBITIONS OUTSIDE THE CATTLE SHOW.

THE Cattle show annually attracts large numbers of visitors, and the presence of a vast multitude of sightseers is a great temptation for poor people who are proprietors of minor exhibitions to try and turn an honest penny. In consequence of the crowd and confusion which always occur on an evening round the cattle show, many visitors are not aware of the stock of extra fun which may be had by a visit to the penny shows which generally swarm in the small streets close to both entrances, and especially near the eastern one. The proper time to visit these shows is in the evening, after dark, when the performances are in full swing. On the last day but one of the cattle show, 1871, I enlisted my curiosity-loving friends Messrs. H. Lee and Bartlett to go the round of the shows with me.

A little way down a dark lane, we heard a tremendous beating of gongs, and saw a blazing light; pushing through the dense crowd, we managed to get near the door. There were, outside the door, two enormous pictures of black men with feathers on their heads, and clubs in their hands dancing round a fire; and a human skull and a drinking jug were lying on the ground close to the fire,

evidently to give an idea that some cannibals had just finished their dinner, and were taking "curaçoa and maraschino" after the fashion of cannibals. A fellow with a cap made of cat's skin, a whip in his hand, and a kind of feather cloak on his shoulders was at the door shouting, "Come and see them eat 'em alive o! eat 'em alive o! Walk in, walk in, we've now got a respectable company, admission only one penny. The wonderful black fellows is just agoing to take their supper. Jim, bring out the rats." He then held up a wire cage containing about a dozen common rats alive. "This is their supper, and they're just a-going to begin." Of course we at once went in, and found ourselves in a blacksmith's shop. One corner of the forge was curtained off: and from behind the curtain I could see four black hands protruding so as to catch the heat of the fire. The room being full of visitors, the master gave a crack with his whip, and made a kind of savage yell. Immediately from behind the curtain there started out with a terrible spring two Caffres—short, but exceedingly powerful men, with very little clothes but plenty of beads and feathers on them. They first of all gave us a war dance, and then showed us how they hunted, speared, and killed the Lion, which beast, the proprietor informed us, "they could smell thirty miles off." The wild men, we were then informed, had the privilege of going round to collect coppers before they had their supper. I gave one fellow half a cigar; he put the lighted end inside his mouth and smoked it in this fashion. I then gave him another lighted cigar, the pointed end of which he stuck in his nose and smoked it.

The money being collected, the cage full of rats was brought in and handed round to shew that there was "no deception." One of the Caffres then thrust his hand into the cage, yelling all the time and acting signs of famishing hunger. He quickly seized a rat and, almost quicker than the eye could follow, put the rat's head in his mouth and bit it clean off. This was certainly not a drawing-room exhibition, but I stood very close to the Caffre and could not help wondering at his remarkable agility in executing the unfortunate rat without getting bitten. I have no doubt that these two Caffres (or their master, which is more probable) gain a good deal of money by killing and eating rats, for in the Caffre's wolf's-skin cap there was certainly two shillings' worth of coppers, and I suppose there were thirty people (at a penny a head) in the room.

The next exhibition we visited was that of a "Fossil human skeleton." Outside the door again was a cartoon. This time it was a picture of a stalactite cave; a man was represented as digging a hole in the floor of the cave while three other people with huge planters' hats on were pourtrayed as standing round in mute astonishment at "the discovery of the skeleton." The skeleton itself was laid out on a board in the middle of a little stick and umbrella shop, and the exhibitor told us a wonderful story—of course perfectly untrue—about its discovery. I at once examined it very closely, and in a few minutes came to the conclusion that the skeleton had never been in the earth at all. There is a certain humble friend of mine in London who gets his living by preparing human skeletons and bones, which he sells to medical students. This

individual, wishing to profit by the cattle show, had cunningly set some old museum human skeleton, which he could not sell, to do duty outside the cattle show. He had covered it over with a mixture of plaster of Paris and common earth, leaving the bones here and there exposed so that they could be seen through the pseudo-stalagmite. The skull was exceedingly well disguised, and I confess that I should not have been so certain of what I now state had I not found an iron wire protruding from the top of the vertebræ, to which the skull was affixed when the skeleton was in proper saleable order for anatomical purposes. There were also traces of iron wire and iron hinges at the joints. Fossil skeletons are *not* set up with wire, thus fully proving to me that this skeleton once had been what we call an "articulated skeleton," and was now made an exhibition of under another term. I have since ascertained that my theory as regards the history of this skeleton is perfectly correct.

Besides the skeleton we got a sight of another exhibition in this room, all included for a penny. This was "the fire-eater." Again from behind a curtain there came out a black man; once more a Caffre; having made a sort of salaam, the proprietor handed to him a saucer containing some burning naphtha. This the Caffre showed us, and then producing a spoon he filled it with the burning naphtha, which he put into his mouth, and swallowed. He continued taking up spoonful after spoonful till the saucer was empty. I suppose altogether he took half a wine-glassful of burning naphtha. He then brought out a bar of red-hot iron, and this he licked with his tongue five

or six times. After the people were gone out I gave the Caffre a shilling to allow me to look down his throat. The inside of his mouth and the *fauces* were in a state of considerable redness and inflammation. I do not, however, think the Caffre actually swallowed the naphtha, but allowed it to burn itself almost entirely away before he put the spoon in his mouth. The inflammation caused by the heated material was not sufficient to do him any real harm. I have before seen the trick of licking a red-hot poker performed in private; the reason why it does not burn the tongue is, I believe, that there is a film of steam, a non-conductor of heat, between the tongue and the iron, which prevents the heat taking effect; still I should imagine that the first trial of this feat would be excessively difficult and dangerous to a person who was not very alert and very careful.

After leaving the fire-eating Caffre we paid our admission fee of one penny to see "the One-legged girl.' This funny creature was sitting like a Chinese idol on a foot-stool, which was placed in the middle of a small tea-table, covered with green baize. She appeared to be about sixteen years old, and was in excellent health, rather nice featured, and always laughing; she had no arms whatever, and apparently but one leg. When the proper complement of people were assembled in the room she began her performance by stretching out her one leg, and picking up an ordinary quill pen between the great toe and the toe next to it. She then dipped the pen in the ink, and wrote her name with her foot; the autograph was a great deal better than that of many young ladies and gentlemen who write with their fingers, and not with

their toes. It was very funny to see her tear off the half sheet of paper on which she had written. In order to test the delicacy of the touch of her toes I asked her to turn over some leaves of note paper with her toes. It was marvellous to see how she never missed a page. She then carefully took a needle from a pincushion with her only foot; unwinding some cotton from a reel, she next bit off a length of it after the manner of females, and passed the thread through the eye of the needle with the greatest exactitude and promptness, not once taking a bad shot. Reaching out her foot she then pulled towards her a set of tea things, and went through the motions of making tea and pouring it out into the cups, and lifting it to her mouth. The last two performances were the combing and brushing her hair, and then showing how she could use the scissors; with the toes she put the scissors on the table, and then passed the great toe and the next one into the rings, holding some writing paper with her left foot, and twisting it about, she set to work cutting out in paper imaginary portraits of people present, which she sold for what she could get. Some years since, I have been told, a man used to exhibit himself in London who had neither arms nor legs, being simply egg-shaped: he used to fix a pen into a socket which he fastened round his chest, and with this he used to write, and, I believe, even paint pictures.

The great power of the human thumb depends upon the presence of a certain large muscle which forms the ball of the thumb, it is called the *opponens pollicis*. By means of this muscle we are enabled to "oppose" the top of the thumb to the tops of all the other fingers. The monkey

has not got this muscle in his hand, which is more like the human foot, and his foot is more like the hand. It was very interesting to observe how this poor one-legged girl had managed to train the muscles of her foot to do the duty of the *opponens pollicis*. These muscles of her foot were very strong and much developed. I think it is a great mistake to shut up the feet of children in tight shoes. When running about the house they should go barefooted; there is no fear of their catching cold, and they may as well be taught to use their feet as well as their hands. The Lascar sailors, I hear, can grasp a rope between their great toes; they never wear shoes. In Mitchell's Australia there is a picture of a native Australian stealing a hammer with his toes. The blacksmith then, according to the story, put a bit of hot iron (not white hot), on the ground, and when Mr. Australian tried to steal it, he was considerably astonished.

The next show was that of a "Learned and Musical Fish." The master of the fish was particularly attentive to me, and himself undertook to make the fish go through his performances. The "Learned Fish" was of course a seal, an exceedingly pretty and intelligent little thing, which lived in a large aquarium containing about four inches of water. The master gave us an introductory lecture:—"The fish was captured four years since, and it had cost upwards of one thousand pounds to train him. In order to prove there was no collusion he would stand at a distance, when the fish would obey the word of command. There was no deception, the fish was alive, and was not as an old woman said publicly, 'a boy sewn up in a seal skin;' nor was it as another person had stated,

'a tamed imp of the d—l.' The fish would now play a tune." An apparatus consisting of two bells was now brought forward; hammers were attached to these bells, and they were worked with levers; a man came to the front and played "Tommy Dodd" on the fiddle, "the Fish" came out of water and beat his fin rapidly upon the levers so as to cause the hammers to make a jingle upon the bells and create a kind of rough accompaniment to the fiddle. The fish then returned to the water, and the master asked him "how many days a week he would like to work," the fish made no sign whatever; as much as to say he did not want to work at all. The question was then asked "how many days a week he would like his master to work;" the creature rolled himself round *seven times* deliberately, to indicate that his master should be obliged to work seven days. Sundry other questions of this character were put by the master and answered by the fish. We all watched very closely to see what sign passed between the man and the intelligent animal, so that the latter might know when to cease rolling, but we were unable to detect any communication, although some sign *must* have passed between them. I imagine the means adopted to teach the fish to roll are somewhat the same as those by which the "learned pig" is made to stop at certain cards spread out before him.

In the same house with the learned fish, was another exhibition upstairs. Of course we went upstairs with the rest of people, hardly knowing what we were to see. The room was parted off by a curtain, and when silence was obtained, the master of the show suddenly cried out, "Skeletons appear!" Immediately from behind the

curtain there came out two of the thinnest wretches I ever beheld; they were short, grim, skeleton-headed men, and wore nearly the same suit of clothes as those patronized by Adam, according to the old pictures we see in galleries. These two living skeletons were certainly wonderfully thin; the living skeleton next to me was, I should say, thirty years old; he stood with both arms and legs extended, and laughing all over his face; his arms were about the thickness of a common broom handle, and his fingers were like bird's claws; his legs were like the legs of an ostrich. I was about to ask "the Skeleton" something of his history, when the master of the ceremonies suddenly cried out, "Skeletons disappear," and they both popped back behind the curtain with the agility of mice when the cat comes into the room. One skeleton, however, popped his bullet head and grim features round from the curtain, and said to me with a squeaky voice, "I say master, give a poor skeleton a bit of baccy." I passed him in a cigar or two, and trust that this poor phantom of humanity enjoyed his smoke, and that the smoke did not dry up what was left of his frame.

The original "living skeleton" was named Claude Ambroise Seurat, who was exhibited in Pall Mall in August, 1825. A picture of him is given in Hone's "Everyday Book." The following were his measurements: circumference of the chest directly under the armpits, *two feet six* and three-quarter inches; circumference lower down opposite the second false rib, two feet two inches; circumference round the loins, one foot nine inches; circumference round the pelvis, two feet

three inches and a half. He was born at Troyes, in the department of Champagne, on the 10th of April, 1797, and was, when exhibited, twenty-eight years of age. Hone also gives notice of a second living skeleton, a rival to Seurat; this man's name was Thomas Feelwell, and his great peculiarity was that he was an *English* and not a French living skeleton; he was exhibited at the Coburg Theatre. Since this period there has been no lack of these exhibitions, and it strikes me as very possible that the market will be over-stocked with "Living Skeletons."

Immediately after the skeletons disappeared, there came blundering out from behind the curtain a gigantic fat woman; the contrast between this huge creature and the poor skeletons was certainly sensational, and the sight was really worth a penny. She was said to be *forty stone*, and to be *four feet* round the waist. For a wonder I did not see attached to this woman an advertisement of "Thorley's food."

Besides the shows above-mentioned, there were two or three others, one of a pig with an extra leg growing out of his side; this pig was in a shed with a horse, but whether the horse was put there for exhibition I could not make out; there was nothing particular about the horse, only that he was very tall, very ugly, and carried a huge head; there was nobody in the place to explain—this was a very dear pennyworth.

Altogether, my friends and I very much enjoyed going round the shows—we did not experience any rudeness or incivility from anybody; the people who owned the shows were certainly a roughish lot, and the "Company" were rougher still. Civility, however, begets civility, and if I

did not learn much, at all events, I was very much amused. I expect the poor people who own these shows sometimes have a hard time of it, I was therefore pleased to hear from most of them that they had done very well during the Cattle Show.

I trust, then, that the remarks which I have made may induce many of our friends in future years to patronize the poor people who own exhibitions outside the Cattle Show. In 1874, these exhibitions were inside the Agricultural Hall, where I visited them.

A few days after my visit a friend of mine went to the Cattle Show, and discovered a new exhibit which I did not see. He thus writes :—"My attention was arrested by a crowd, and an invitation issuing from stentorian lungs to "Step hinside and see the createst cur'osity in the world, as has been hex'ibited before all the crowned 'eds in Europe." There were two showmen who shouted their appeals to the public in somewhat the following form :—

First Showman.—"Be in time! be in time! The 'all is nearly full, and we are just agoing to begin. 'Ere you will see the mermaid recently caught hoff the coast of Japan. The honly one hever imported into this country."

Second Showman.—"It is alive! alive! alive! Do not miss the honly hopportunity you will ever 'ave hof seeing the mermaid."

First Showman.—"The haged Japanese fisherman his now proceeding to feed the hanimal."

Second Showman.—"Alive! alive! alive! hand now feeding. (Appealing to the man inside), Is there hextra charge at feeding time?"

From inside.—"No, sir—no—no extra charge" (and then, in the loudest tone he could command)—"You are satisfied, ladies and gentlemen, that there is no deception—you are satisfied that it is ALIVE!"

Having, therefore, the assurance of these three gentlemen that it *was* alive, I had no hesitation in entering, but cannot say I felt impressed with this temple of science. The "'all," measured some 12 feet by 9 feet, and had neither fauteuils nor carpets. I then found that the appeals to the audience unmistakably referred to a sheep with two excrescences on the shoulders, which was repeatedly referred to as the "six-legged sheep," and which certainly was "alive," and calmly munching some sliced turnip, in the preparation of which the "haged Japanese fisherman" took no part, nor did I even once catch a glimpse of that worthy, the Professor announcing his intention of at once introducing the mermaid himself, which he did by mounting a pair of steps, and disclosing, by the withdrawal of a curtain, a glass case fixed at a great elevation and containing the upper half of a hideous monkey, to which was clumsily attached the tail of an ordinary cod-fish. "This, Ladies and Gents, is the mermaid," said the Professor, replacing the curtain in such a hurry as to leave little else for record. "The performance is now concluded; sound the gong, Jem, and let the gents pass out."

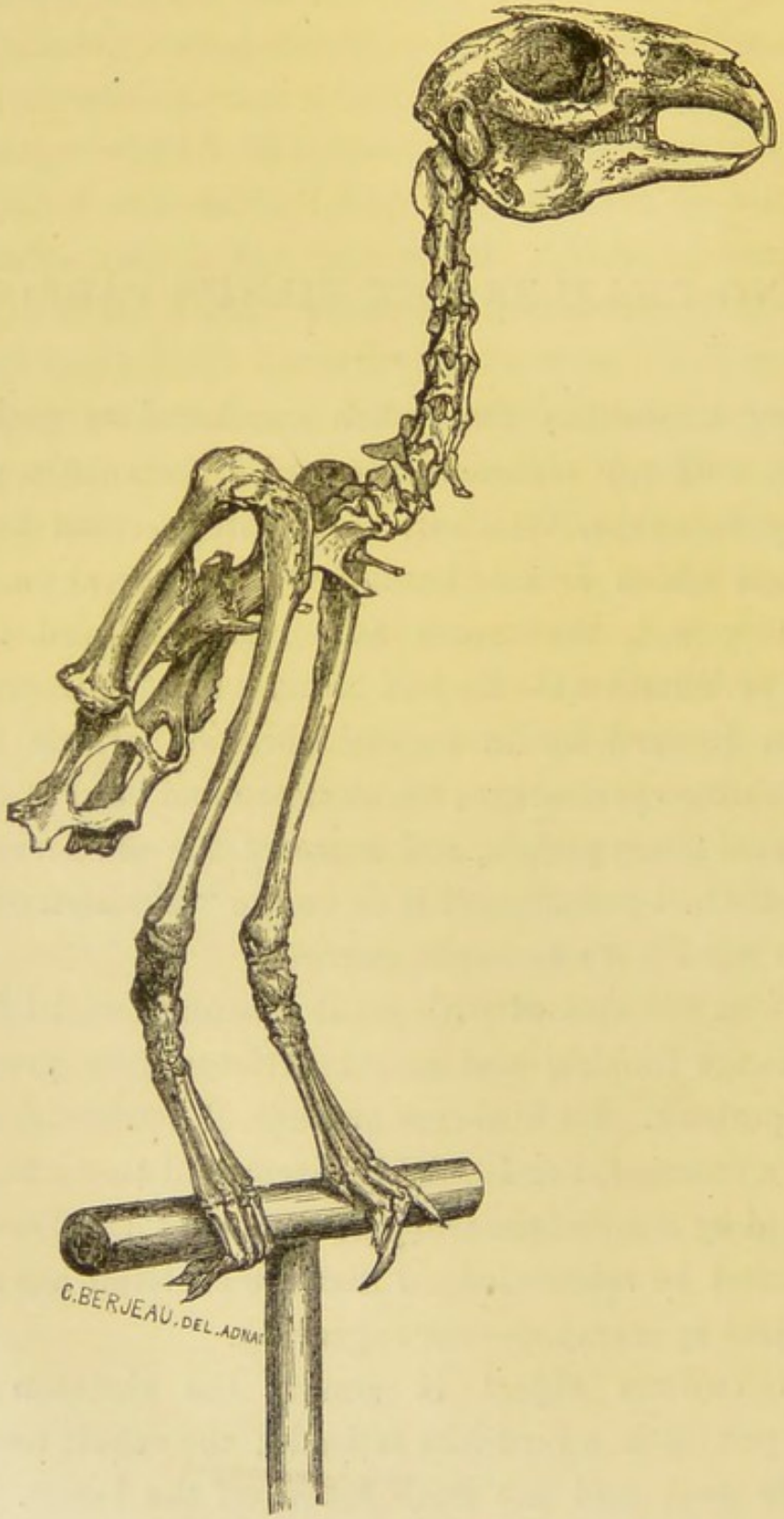
KING CHARLES THE FIRST'S PARROT.

About Christmas time when quartered as assistant-surgeon with my regiment, the 2nd Life-Guards, at the Cavalry Barracks, Windsor, my soldier-servant brought me a box which he said contained a very great curiosity. The story was, that some labourers employed in the repairs of Windsor Castle had found a most extraordinary skeleton bricked up in an old chimney of one of the Queen's state apartments; the skeleton had been examined by a great many people, and some of the old servants of the Castle had pronounced it to be the "Skeleton of King Charles the First's favourite parrot."

The box was opened with great solemnity, and I beheld the strange looking and weird skeleton now presented in the portrait. Its bird-like attitude, I confess, deceived me for a moment, but I quickly discovered that a trap had been laid by some of the troopers to catch "the Doctor;" for it must be acknowledged that the skeleton has a very parrot-like appearance—see engraving.

This curious object is simply the skeleton of a rabbit, put up in a bird-like attitude; the rabbit has been cut into two, and the flesh taken off the bones, which are coloured brown to give an appearance of antiquity;

the neck bones and part of the back-bone have been left



SKELETON OF KING CHARLES FIRST'S FAVOURITE PARROT.

attached to the head; the hind legs have also been left attached to the hip bones, or pelvis, and the two halves of the animal then fastened ingeniously together in the outline of a bird's skeleton; the hind legs have been neatly tucked up exactly like the legs of a bird sitting, and the bones of the rabbit's feet have been moistened and then turned round a perch to give the idea of a bird's claws. The whole thing was then set upon a perch to carry out the idea of a bird, especially a parrot.

I afterwards found out that this skeleton had been prepared for my special benefit by an ingenious Life-Guardsman, who wanted to get a laugh against me. This then is the true history of "King Charles the First's favourite Parrot found in Windsor Castle." The specimen itself is now in my museum.

FOOTSTEPS IN THE SNOW AT THE ZOOLOGICAL GARDENS.

On the morning of the 31st December, 1870, finding the snow thick upon the ground, I determined to give myself a couple of hours' holiday from writing, and, at the same time, take a lesson in practical observation, my favourite study. I have always been very fond of Ichnology, or the study of footsteps. In the Zoological Gardens we have the rare opportunity of studying the footsteps of wild creatures from all parts of the world; and when Nature lays down a snow carpet easily impressed by their feet, we have a chance of learning something new.

Upon arriving at the gardens I found my friend Bartlett luckily disengaged, and willing to accompany me in my run round the various paddocks. The first creatures we observed were the beavers; they seemed quite at home and happy in the snow. Their tracks were very curious. When the beaver goes through the snow he makes himself into a shape like a kind of plough, and drives the snow with his paws before him into a heap. There were, therefore, no footmarks at all, but the track left by the tail is very perceptible. I recollect seeing a picture in a book representing a beaver using his tail as a hammering

instrument, or rather smoothing trowel, to flatten down the mud on the top of his hut. The beaver never did, and never will, make use of his tail after this fashion; it is simply the modification of a fin, enabling the animal to steer himself in the water and to obtain a fulcrum on marshy grounds and swamps, while he sits up on his haunches to work with his fore-paws and sharp, chisel-like, teeth. The wing of the penguin is not unlike the tail of a beaver in general appearance. A chapter might be written on tails, showing the great diversity of work they have to do; but who can tell the use of a pig's tail? The beavers seemed perfectly at home and happy in the water, which they kept from freezing all over by continually swimming about. They went down through one hole in the ice and out at another. It may be possible that this was an instinctive act to keep the holes open, so that they should not be frozen out of their house.

We next examined the wolf; the Arctic wolf has a very large spread-out foot, much webbed between the toes; the expanse of the foot being, as far as I could make out, quite four inches. Other wolves, which do not live in the Arctic regions, have not this expanse of foot. Here we have nature indicating snow shoes such as are worn by Norwegians, Esquimaux, &c.

We next came to the Camel; here we have a foot certainly not intended for snow, but yet for an elastic yielding substance; the camel has a beautiful elastic pad, (composed of horn outside and elastic tissue inside) at the bottom of his foot, forming an admirable provision for preventing him sinking into the sand. The poor camel did not seem to like coming out in the cold, but

the few steps he took were quite enough to show me what his track was like; the mark of the foot is of a roundish form, and as he walks he puts the hinder foot exactly into the track of the fore foot. There must be some meaning in this, but, never having studied camels' tracks on the sand of the desert, I cannot interpret this fact.

The distance the camel takes at each stride is only one foot eight, so that the step is short and quick.

There were two Canada geese in the enclosure close by the camel, and upon the snow in their enclosure I observed some singular and remarkable tracks. For a considerable distance along the snow on the right hand side, there were a series of semi-circles; on the left hand, simply some gashes cut pretty deep into the body of the snow; between the marks there was a straight line cut somewhat deeper into the snow. We afterwards found out what this meant. A goose whose left wing had been cut, while her right wing remained intact, had been making an attempt to fly; the semicircular marks were the beatings of the wing which had not been clipped, as it swept the snow backwards like an oar; the gashes on the left hand side were the markings of the wing which had been clipped. The track in the middle was made by the bird's feet.

The polar bear had unfortunately trodden down all the snow in his den, so that his footsteps were very difficult to make out. One footmark, however, was left by the side of the pond; this indicated that the track of the polar bear shows claw markings on the anterior aspect, that it is very broad, and that the hair which surrounds the foot probably enables the animal to obtain a firm

foothold upon the slippery ice. I could not, of course, get any notion of the tracks of the lion, tiger, &c., as they were in their dens, where there was no snow. The track of the Llama is very curious; the foot is somewhat camel-like, and the animal pushes the snow in front of him at every footstep. Will anybody tell me why the Llama uses its terrible power of spitting as a means of defence? Snakes are said to have the power of spitting, but they never do anything of the kind.

The track of the emu is exceedingly interesting; it reminded me exactly of the representation of the celebrated Ornithichnites, or bird-footsteps, figured in my father's "Bridgewater Treatise;" the emu also drags his footsteps, so that there is a regular line upon the snow, connecting one footstep with the other.

Of all the animals in the Gardens, the Seals appeared mostly to enjoy the cold weather. The sea-bear was quite by himself, on the middle of his pond, not *in* it, for it was frozen over. He scanned the horizon two or three times with an anxious look, as though wondering where Tierra-del-Fuego was, and possibly wishing he was back again at home among his brother sea-bears, although he could not possibly have a kinder friend or nurse than M. Le Compte. There was a beautiful piece of undisturbed snow close by, so I requested Le Compte to march Mr. Sea-bear over it. The apparently clumsy beast took the low iron fence "like a bird," and the track he made was very curious. This animal has two modes of progression; the one where he puts forward alternately his great Bob Ridley-like fore flippers, and pulls his hinder flippers up to them with a jerk, somewhat like the action

of a frog hopping; the other where he pulls himself along by means of his fore flippers, while the rest of his body follows in a loose, draggling manner behind, his hinder flippers being elongated as a tail. When progressing in this way he reminded me much of a snake with a broken back. Le Compte says that this is the ordinary mode of progression of wild seals. There were three other common seals. These merry little things advanced by means of jerking themselves forward, the action being not at all unlike that of a gigantic caterpillar. The track they made was scarcely a track at all, simply a deep, indented, wide furrow. The seal has great power of progression by means of rolling, and doubtless he is thus able to get off his perch on the ice, into the sea, in a very short space of time.

The tracks of wild swans are interesting. The foot is of very great breadth; the toes sink deeper than the webs between them, so that the snow assumes the form of a little hill where the web has touched it; there are, on the contrary, deep valleys where the toes have touched. The smooth broad mark, left in the place where the swan had sat down to rest in the snow in the usual elegant attitude, was beautifully distinct. The Pelicans are such clumsy, shuffling brutes, that their tracks simply amounted to a rude disturbance of the snow. At a distance from the track there were sharp cuts in the snow, made by the lashings of the outermost tips of their long wings. Where the pelican turned sharp he left a capital impression of his tail, as sharply cut as the figures on the top of a pat of butter. The wild duck's track shows how very regularly the little rascal puts down his feet. He takes long steps, no less than five inches between each step.

The cormorant makes a triangular footmark. It is also very interesting to notice how the stiff tail feathers give the bird an additional support, so that, in fact, he sits on a three-legged stool. The eyes of the cormorant, gannet, and all fish-eating birds, I may here remark, have their axis of vision well forward, while their necks are very pliable—obviously a piece of mechanism to enable them to catch fish easily. The fish, being a water creature, has a fair chance of escape from an air-breathing creature like a bird. Nature, however, has given the cormorant capital tools to work with.

The footsteps of the stork and heron make a deep and well-formed imprint in the snow. The wild boar had trodden out all his footsteps. Those of the peccary were interesting, showing that this animal proceeds with a high action, lifting his legs well at every step.

It may be recollected that some years ago a great sensation was caused by the mysterious tracks of an animal, that were traced for many miles right across country after a heavy snow-storm. This happened either in Devonshire or Cornwall. The more absurd a story of this kind is, the greater popularity it invariably gains. All sorts of theories were started to account for these wonderful footsteps. All the old women of the country went to bed trembling, and the farmers loaded their guns, and double locked the doors. People would not go out after nightfall; in fact, there was a general alarm somewhat similar to one which I can just recollect as a boy, when some mysterious footsteps were discovered near Hounslow. These were said to be made by "spring-heeled Jack," a certain mysterious individual who also took his walks

abroad in the dead of the night. The Devonshire mystery was soon explained, when examined by a competent person. The footsteps turned out to be simply those of a poor tame racoon who had escaped and enjoyed a scamper across country during the snowy nights for several miles. I have a strong suspicion that spring-heeled Jack of my schoolboy days was simply an escaped kangaroo.

When passing through Taunton once I found the walls and hoardings placarded with gigantic advertisements. "Five Pounds Reward. Lost, a young Tasmanian Devil." It appeared that a Diabolus Ursinus, well known to the colonists of Van Diemen's Land, also called a "Tasmanian Devil," had got loose. I understand that he was subsequently caught in a hen roost, where he had committed sad havoc among the fowls.

My father was very fond of Ichnology; in fact, he and I used to work at it for the sake of interpreting certain fossil footsteps found in the old red sandstone. There were some wonderful footsteps once discovered near Dumfries, and my father had given a lecture upon them, I think at Edinburgh. During the discussion that followed the lecture, one of the visitors put the following question publicly:—"I wish to ask the learned Doctor how it is that, according to his statement, the Cheirotherium seems always to have gone persistently in one and the same direction?" The Dean, who could give a witty answer when he liked, looked over his spectacles sternly at the questioner, and answered, "Sir—Cheirotherium was a Scotchman; he was ganging south, and na came back again,"—a remark hailed with shouts of delight by a Scotch audience.

ICE ACCIDENT TO THE RHINOCEROS.

—+—

During the hard frost of December, 1870, the Zoological Society nearly lost their Rhinoceros by drowning. The animal had been turned out in the morning as usual into the paddock behind the elephant house, while the dens were being cleaned. The snow had fallen thickly during the night, so that the pond was not to be distinguished from the ground. The rhinoceros not seeing the pond put her fore feet on the ice, which immediately gave way, and in she went, head over heels with a crash. The keepers ran for Mr. Bartlett; when he came, in a few minutes, he found the poor rhinoceros in great danger of drowning, as she was floundering about among great sheets of ice, under which she had been kept down till her great strength enabled her to break up the whole mass. Here then was a most awkward accident, under unexpected and novel circumstances, putting Mr. Bartlett's readiness of action to the test. My friend, however, with his usual courage and quickness of resource, was quite equal to the occasion. He immediately let the water off the pond by knocking away a large plug which, when the pond was originally

constructed, he had thoughtfully fixed instead of a tap, a contrivance liable to get out of order. In the meantime the poor rhinoceros was in great danger of drowning, as the pond is nine feet deep, so while the water was running off, Mr. Bartlett, losing no time, sent for all the available keepers and a long and strong rope; barrow loads of gravel were at the same time strewed on the sloping sides of the pond, to give the exhausted animal a foot-hold. The rope was then tossed round the haunches of the rhinoceros, like the kicking-strap of a horse in harness, and twenty-six men, one half at one end of the rope, and the other half at the other, pulled hard on the rhinoceros, so that in her struggles to get up the bank she would not only be supported but pulled forcibly forwards. After much hauling on the part of the men and much plunging on the slippery bank of the pond, the rhinoceros was at last landed on *terra firma*. The salvors of this valuable living property had then to look out for themselves. Mr. Bartlett had anticipated this, for he had left the sliding gate of the enclosure open just wide enough to let out one man at a time, but not a rhinoceros. When the rhinoceros was landed, an absurd scene took place : everybody rushed to the gate, but the first of the fugitives, being naturally stout, and possibly stouter at Christmas time than usual, jammed fast in the open gate, so that the other twenty-five men were in the paddock with the rhinoceros. The poor frightened and half-frozen beast luckily behaved very well; she did not rush after the men, but stood still, pricked her ears and snorted, giving the keepers time to get out as fast as they could and how they could, through the ingenious "man-hole" or guard in the

railing, made in case of emergencies. Neither the rhinoceros nor the men received the slightest injury. Shortly after the accident I saw the rhinoceros munching her breakfast as if nothing had happened. This rhinoceros was the big female, which was about 10ft. 6in. long and about 5ft. high at the shoulder, and weighed at a guess between three and four tons. The ice I found was four inches thick.

I think the Society are much indebted to Mr. Bartlett for the admirable way in which he prevented what might have been a bad accident.

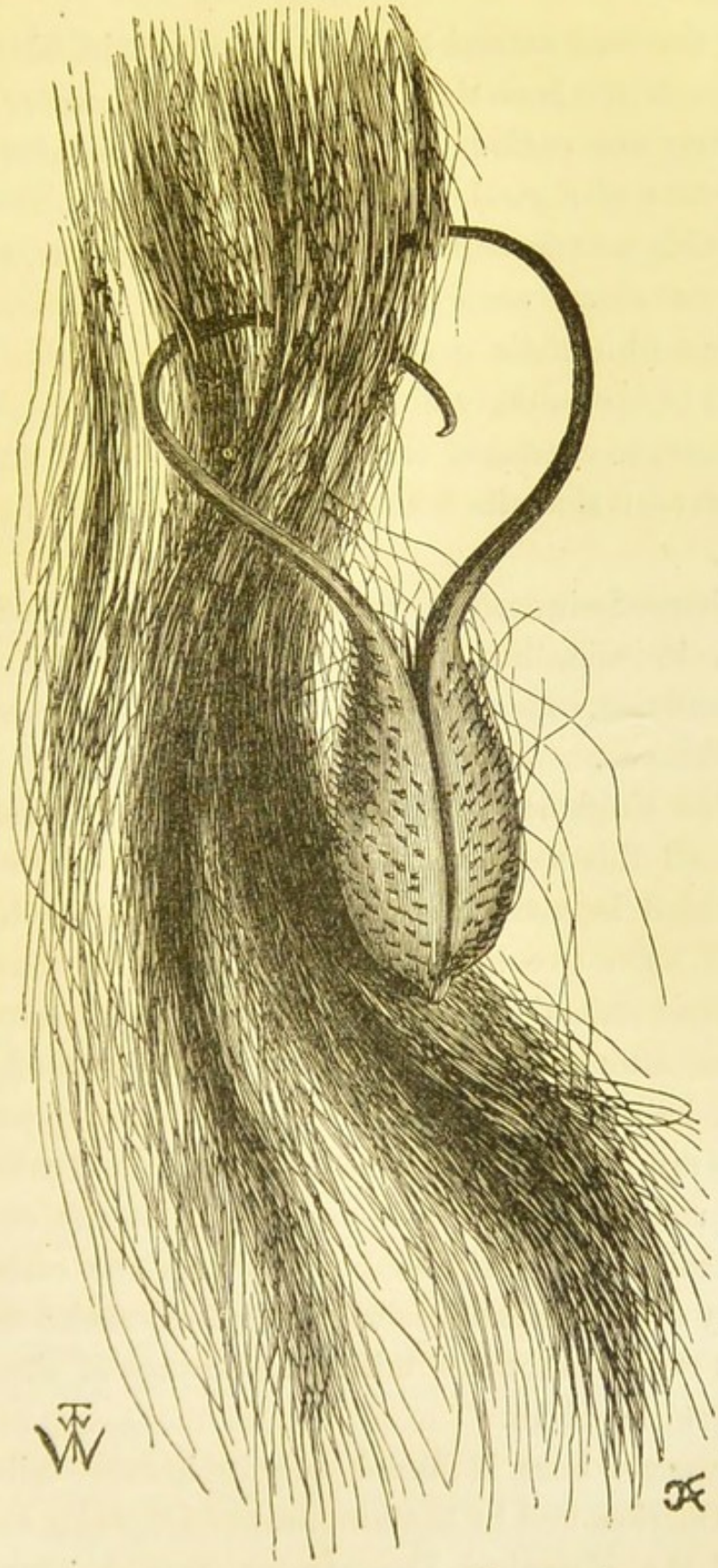
This rhinoceros died three years afterwards, in Dec. 1873, after having lived in the Gardens for twenty-two years.

MOUSE BURR FROM HORSE'S TAIL.

In the spring of 1865 I had the honour of delivering a lecture at Sheffield, and the next morning my friend, Mr. Edwin Porter, was good enough to introduce me to the Messrs. M——, the principal manufacturers of hair in that busy town.

The manufacture of the horse-hair itself, especially the manner in which the hair is sorted into different lengths, was exceedingly interesting; but what struck me most was a magnificent horse-tail from Buenos Ayres, full of burrs, not unlike the common burrs one finds in England.

Among these tails sometimes are found most extraordinary and curious burrs, which are called in ordinary parlance, "Mouse Burrs," on account of their strong resemblance to a mouse. Nature seems to have formed this curious seed for the special purpose of sticking to horses' tails. It will be seen from the drawing that its body, which is three inches long and three inches in circumference, is thickly studded with hard and horny prickles, the points of which are all directed upwards and outwards, with the express object, one might almost imagine, of entangling and holding fast in horses' tails. From the upper



MOUSE BURR FROM HORSE'S TAIL.

part of the seed extend two giant and formidable-looking horns, each no less than five and three-quarter inches long: they are curled and twisted so as to form nearly three parts of a circle. The extremity of each arm is tipped with an exceedingly sharp horn-like spur, and the two arms cross each other in such a manner as to embrace within their grasp a great bunch of the horse's tail. It is exceedingly difficult, even with a knife or pair of scissors, to extricate the burr from the tail, and I am quite certain that the horse could never get rid of it by himself.

The horse-hair used in manufacture comes chiefly from Siberia, Prussia, Sweden, and from Buenos Ayres, in South America, especially from the half-wild horses found in the Pampas.

In 1855 England imported 27,150 cwt. of horse-hair; besides all this a great quantity of English horse-hair is used, which is much better than that imported. The hair cut off a live horse is very superior to that taken from a dead animal. The curly hair is twisted into cords, which are afterwards opened, and used for stuffing. The straight hair is woven into cloth for upholstery purposes and for army helmet plumes, especially in Turkey. A queue or tail of horse-hair suspended at the end of a pike, terminated by a gilded pennant, is the emblem of authority of a Turkish Pacha of the third rank; those of the first rank have three tails. The usage of these tails is of Tartaric origin.

The mouse burr is found only in horses' tails from South America, and by the kindness of Dr. John Bennett, head of the Botanical Department, British Museum, I

am enabled to give the following information about it. Dr. Bennett writes to me as follows:—"The drawing represents the fruit of *Martynia proboscidea*, originally discovered by Houstoun, in Louisiana, about the commencement of the last century, and since cultivated in all the botanical gardens of Europe on account of the singularity of its form. It inhabits all the warmer parts of America, from the valley of the Mississippi to Peru. There is another species in Mexico, with much shorter and more rigid hooks, which is there called the 'Devil's claws.'" *

The subject of the spread of plants by seeds (we might almost call it the locomotion of seeds) is exceedingly curious. To take two extremes. We find that the thistle seed is transported by means of very beautiful down-like wings. The seeds of the plane and ailanthus trees have wings amazingly like the wings of a dragon-fly, and as they are transported by the wind twist round in the air like an Australian boomerang. In the Mouse Burr we find a seed literally armed with formidable claws, by means of which it clings on to the tails of animals that happen to pass by. We may suppose this "mouse burr" to have been indigenous to the soil from the creation of the soil itself. It cannot therefore have been especially

* A correspondent writes:—"I am happy to tell you that I was very successful last year in raising that curious plant from South America, called the "Devil's Toe Nails." It is not a very euphonious name, but I am quite ignorant of its having any other. I struck the seeds (which were brought over and given to me by Mr. Higford Burr, of Aldermaston) in heat, and then put the young plants out on a bed prepared the same as for vegetable marrow, where they did very well indeed."

intended for horses, as horses are not indigenous to South America, but were introduced at a comparatively recent period.

This event first took place, according to Azara, about the year 1535, when the city of Buenos Ayres was suddenly abandoned by its inhabitants, who in their flight left behind them on the plains five horses and seven mares, which had been brought from Andalusia. These soon multiplied and gave origin to those innumerable herds which people the boundless plains southward and westward of the Rio de la Plata; while others, escaping from the settlement north of the same river, multiplied in Paraguay and other parts of the interior.

I should feel obliged if any of my friends who have been in South America would kindly give me further information relative to the natural history of the Mouse Burr, or furnish examples of the locomotion of seeds from instances which have come under their personal observation.

London hearse-horses have very fine tails. The largest horse's tail I ever examined weighed two pounds two ounces; the hair was no less than six feet in length. The horse belonged to Mr. Ebbutt, undertaker, of Croydon, whose team of hearse-horses have the best tails I ever saw. Much trouble is taken with the tails to keep them in order. If they were ornamented with a few Mouse Burrs they would be still more interesting.

EMUS AND KANGAROOS AT BLENHEIM PALACE.

His Grace the Duke of Marlborough has achieved a triumph in acclimatization which has added a wonderful charm to the beauties of his noble estate. Vast and magnificent as are the grounds attached to Blenheim Palace, no part of this beautiful domain can be of greater interest to the true lover of natural history than the Emu and Kangaroo paddocks. These paddocks it has been my privilege to inspect. After first showing me the rearing place built for the young great-lake-trout from Neufchâtel, with which he hopes to stock the lake at Blenheim, the Duke handed me over to the care of old Long, the special guardian of the Emus. Passing through the well-kept grounds, we soon came to a rustic temple, commanding a glorious view of the lake and the surrounding woods. On the temple is an inscription, probably suggested by some Poetical Oxford scholar, which reads thus:*—

ΑΡΤΕΜΙΔΙ ΑΓΡΙΑΙ ΙΑΔΙ ΟΡΕΣΤΙΑΔΙ

* A correspondent has suggested the following translation for the motto:—"Will you permit me to mention what I think to be the meaning of the third word in the inscription on the temple at Blenheim. I believe that ΙΑΔΙ, the adjective in question, is the dative of *Ἰας ἄδος* (*η*), and signifies Ionian, being made use of in reference to the great huntress's temple at Ephesus in Ionia, reckoned one of the seven wonders of the world. It distinguishes the daughter of Latona from

which, being interpreted, means, "DEDICATED BY THE RUSTIC MOUNTAIN NYMPHS TO THE IONIAN DIANA."

Turning short to the left after leaving this temple, Long conducted me to the Emu paddock. "I will show you the chicks first," said he. Throwing open the door of a shed, I saw a great lot of straw on the ground, and, in one corner, what in the dim light appeared to be a feather bed with a long neck. "That's the old bird," said he, "but he is precious artful; he don't want to be disturbed." The old Emu was evidently following his instincts by keeping as quiet as possible to avoid observation. "It's always the male bird as sits," says Long; "he has sat on them eggs for eleven weeks, and I knows they is good for nothing. There's a dead chick in every one on 'em. I knows by the shake and the weight they ain't no account. I be sure on it, and he'v' a'got three chicks as he's a nussing as well as the eggs, and fine chicks they be."

"Get up, Tom; get up, you rascal," said the old man, giving the bird a slight touch with his stick. So Tom, seeing that disguise was of no further use, jumped up like a jack-in-the-box, shook out his beautiful feathers, gave a peck at me as he passed, and stalked solemnly out of the building. To my great delight three little emus appeared squatting on the ground as quiet as granite blocks, as their magnificent nurse rose up from the nest. Seeing their father go out, the dear little things ran after him. They were all small editions of their parents. Imagine an Emu

her two less celebrated namesakes, the daughter of Proserpine and the daughter of Glauce. The meaning of the whole inscription I think is:—Dedicated by the rustic mountain nymphs to the Ionian Diana, (Diana of Ephesus.)"—B.B.

seen through the wrong end of a telescope, and you have a good idea of an emu chick, but their colour does not resemble that of their parents; they are striped with black and white, and look not unlike a bit of animated zebra's skin.

"The old Tom" (said Long) "will take care on 'em till they be big ones, and the t'others can't run 'em. He picks up the food for 'em, and drops it just like a hen does for her chicks, and he calls 'em in his way. When he takes 'em round the field he goes along with 'em, and he picks up his great long legs so as to be careful not to tread on 'em. They don't want for nothing, does them chicks, and they are healthy and well. I feeds 'em now, their mother don't care nothing about 'em; if she was to come into the paddock she would throw the chicks up into the air with her head as high as them trees. I had a job to find out how to feed 'em. I've reared thousands of pheasants in my time.

"I am seventy-two years old, and I've never been further away from Blenheim than fourteen miles, and then I went a-shooting with the present Duke's grandfather, and I recollect his great grandfather. I've three sons gamekeepers to the Duke now, and my sons knows how to rear pheasants as well as I does. When the emus first come from Australia the Duke put 'em under my charge, and when the first lot of chicks was hatched I could not tell how to feed 'em. So the Duke gives me a book; but this ere book ain't no use—not a bit on't. If I had agone according to this book I should never have reared 'nairn'" (Oxfordshire for "never a one"). "This book said I was to give 'em peaches and apricots, and them sort of things,

but where was I to get peaches and apricots in May? so I lays in bed of a night and studies. I knows young pheasants likes anything milky, so all at once I thinks of spinach. The next morning at sunrise I was off with some spinach to the emus, and they pecked at it as though they would eat the ground. So I says to myself, What the old ones likes the young ones likes; and now I feeds 'em principally on spinach. I sits upon the stone water trough, and if I says to chicks, 'Come,' they comes along directly. I cuts up the spinach fine for 'em with my knife, and I pads off the old Tom with my stick while the young ones feeds; they likes bread, too, and cake, but spinach is what they is most partial to. But these little things wants a deal of feeding. I has to feed 'em four and five times a day; they runs out and feeds, and then back again they goes. I knows all about feeding and rearing 'em now. I could breed as many emus as pheasants if I could only get the old Tom to sit on the eggs to hatch 'em; *I'd* rear 'em if he'd only hatch 'em. A hen lay her eggs this year among the dead leaves in the sunk fence under the wall, and the male bird come to sit on 'em; he was often drove off the nest by visitors who came to see the pleasure gardens. So I built a kind of a house over him with bushes, but after I had put the bushes he never come to sit on the eggs no more. It's no use making a place for the emus to sit; if they don't fancy a place they won't have it; they will go where they have a mind. But what is a most curiosest thing, is that the male birds knows when to go on the eggs, and he don't go on till the hen has done a laying; he has sense enough for that, though he has not sense enough to know

when the eggs he's a-sitting on is addled and good for nothing, but yet he keeps on 'sit,' 'sit,' 'sit,' though his right time to sit is eight weeks and two days."

We then went on to the paddock where the full-grown emus were kept. I do not recollect ever seeing such a grand sight as these magnificent birds crowding round the old man as he opened the gate. Tame as chickens, and almost gigantic as ostriches, these glorious birds nearly hustled old Long off his legs. "Go along with ye, go along with ye," said the old man, as he pushed them aside; "you have all had your suppers, and I've nothing more for you to-night. A fine lot of birds, ain't they, sir? Eleven in the paddock, and the old Tom in the shed, that makes twelve, and then there is the three chicks, fifteen in all; and nice healthy birds they be, all on 'em. The first birds were given to the Duke eight years ago by his brother, Lord Alfred Churchill; two were males, and one was changed with the Zoological Gardens for a female, and all the birds you see here come from that lot. We never lost any from disease; only one died, and that was from an accident—dancing on the ice in frosty weather, he fell, and broke his leg. They seldom go into the shed. I feeds 'em regular, but they picks up many things we knows nothing about, and they're always a-pecking at something.

"Eat, sir! Why, them things would eat any mortal thing, but what they likes best is lumps of ice. One frosty day I comes with my old knobby stick, and breaks the ice in the stone trough, and they very soon ate it all up, for when I saw they liked it I kept on breaking it for 'em.

"Make them run, Long," said I. "Run, sir! they would run if *I* could run, sir, but I can't; I got the gout in one foot and the rheumatics in the t'other knee. I'm lame of both legs, sir, and *I* can't make 'em run, and they knows *I* can't run as well as I knows myself: but, bless me, sir, you should have seen 'em when Lord Randolph's harriers got into the paddock. *They run then*—such a job; but the hounds never catched e'er a one, and his lordship he run till his nose bled. It *was* a job, and no mistake; but no harm was done, and the Duke he never said nothing about it."

We then inspected the kangaroos. These are kept in a paddock with high walls. When Long unlocked the door of the enclosure where the kangaroos were, they were feeding at the far end of the paddock, and being frightened at our coming in, they made off at once for their shed, several yards away. In doing this they had to pass in front of us. They came along in line at a racing pace, like horses in the Derby passing in front of the grand stand at Epsom. One of the lady kangaroos had her little baby in her pouch. It was very funny to see the little thing's rat-like head peeping out and looking one way while her mother was hopping the other. The kangaroos did not use their tails as propellers, but simply carried them behind them with a graceful curve. If I recollect aright, the tails did not even touch the ground. The use, therefore, of the kangaroo's tail is, not to act as a propeller, but rather as a balance, and also as a support to his body when he is sitting upright, like the curious old seats one sees in cathedrals, so arranged that the monks could lean against them, but if the monks went to sleep, the seats fell down.

I have the bones of a kangaroo's tail now before me. The total length of the tail is two feet five inches; it consists of seventeen bones, all of them being very like the bones found in ox-tail soup. The bones vary in size from two inches in length to one not more than half an inch in length. There are a series of projections upon the bones, between which sinews run, as in the brush of the fox, which, as most people know, is most difficult to skin properly. At the lower side of the tail the bones are thrown over so as to afford protection to the continuation of the spinal cord. These sinews and the gelatinous material found inside the tail bones of most animals —fox excepted—make excellent soup, and I am told that kangaroo-tail soup is considered in Australia as good as, if not better than, ox-tail soup.

The use of ox-tail soup in England, I am told, is not very ancient, the origin being, I believe, as follows. At the end of the great war there were a great many French prisoners in England; by way of feeding them cheaply the commissariat used to supply them with ox-tails, then considered as offal, and left on the hides. The Frenchmen, with their usual cleverness in cooking, made these tails into soup, and this is the origin of the ox-tail soup, —a story which, I think, should not be forgotten.

The kangaroo principally propels himself by means of tremendous muscles on his hind legs, and the length of the bones beneath the hock gives him a considerable leverage, by means of which he is enabled to hop with a flea-like action. Under certain circumstances the tail acts as a balance; any one who has seen a rat crawl along a rope, cannot fail to have noticed that the rat uses his

tail as an acrobat uses his pole when traversing the tight-rope. The hare, also, has tremendous propelling power in her haunches, yet she has a short tail—nobody ever yet saw a hare with a long tail. The hare does not hop; the kangaroo is a famous hopper.

Sculptors are sometimes obliged to use a species of tail in balancing their statues. At St. Petersburg there is a bronze statue of Peter the Great. The Czar is represented as sitting on a horse; the horse is rearing upon his hind legs, and pawing the air over the brink of a precipice; at the feet of the horse there is a bronze snake, whose coils project to a considerable distance from the horse's tail. The sculptor's account of his reason for introducing the snake is, that the "serpent is an allegorical figure of envy, spurned by the Czar;" whereas I believe the real fact is, that the sculptor found that his horse, Peter and all, might possibly topple over, so he put the bronze snake as a balance to keep the horse standing safely on his hind legs.

A somewhat similar fact can be observed nearer home. If the reader, when he is next passing Charing Cross, will look up, he will find that behind Lord Nelson's statue, and a little to his right side, there is a mass of granite representing a coil of cable; this cable, I believe, was introduced in order to act as a balance to the tremendous weight of the figure.

The Duke's emus got off well when the hounds came to Blenheim, not so his grace's kangaroos, for during a run with the Heythrop Hounds on January 3, 1874, the fox was run close to the cowhouse. The hounds got off the scent, and in casting about got scent of the

kangaroos, and very soon a most exciting scene occurred. The kangaroos bounded away in all directions, and the hounds did not seem to know what to make of the matter. I was sorry to hear that two of them were killed. This of course was an accident much to be regretted.

I am very anxious that kangaroos should be cultivated in English parks. I am sure they would do well, and be very ornamental, as well as forming a new dish for the table. I wish some gentlemen would oblige me by trying the experiment. A French naturalist, M. Cornély, writes: "The experience of the various zoological societies in Europe shows that kangaroos will thrive and breed in our climate, damp being the only condition which is fatal to them. They will bear great extremes of heat and cold without injury. Kangaroos are not destructive to trees and shrubs, and if they contract the habit of barking trees, they can be broken of it by shutting them up for two or three days without food. On being released, they are so eager in search of grass that they do not touch the trees."

By the way, I wonder if the reader knows the origin of the name kangaroo. The story, as told me by my friend the late Mr. E. Blyth, runs, that when Captain Cook first discovered Australia, he saw some natives on the shore, one of them holding a dead animal in his hand. The Captain sent a boat's crew ashore to purchase the animal, and, finding, on receiving it, that it was a beast quite new to him, he sent the boatswain back to ask the natives its name. "What do you call this 'ere animal," said the sailor to the naked native. The native shook his head and answered, "Kan-ga-roo," which means in Australian

lingo, "I don't understand." When the sailor returned to the ship the Captain said, "Well, and what's the name of the animal?" The sailor replied, "Please, sir, the black party says it's a 'Kangaroo.'" The beast has kept this name ever since.

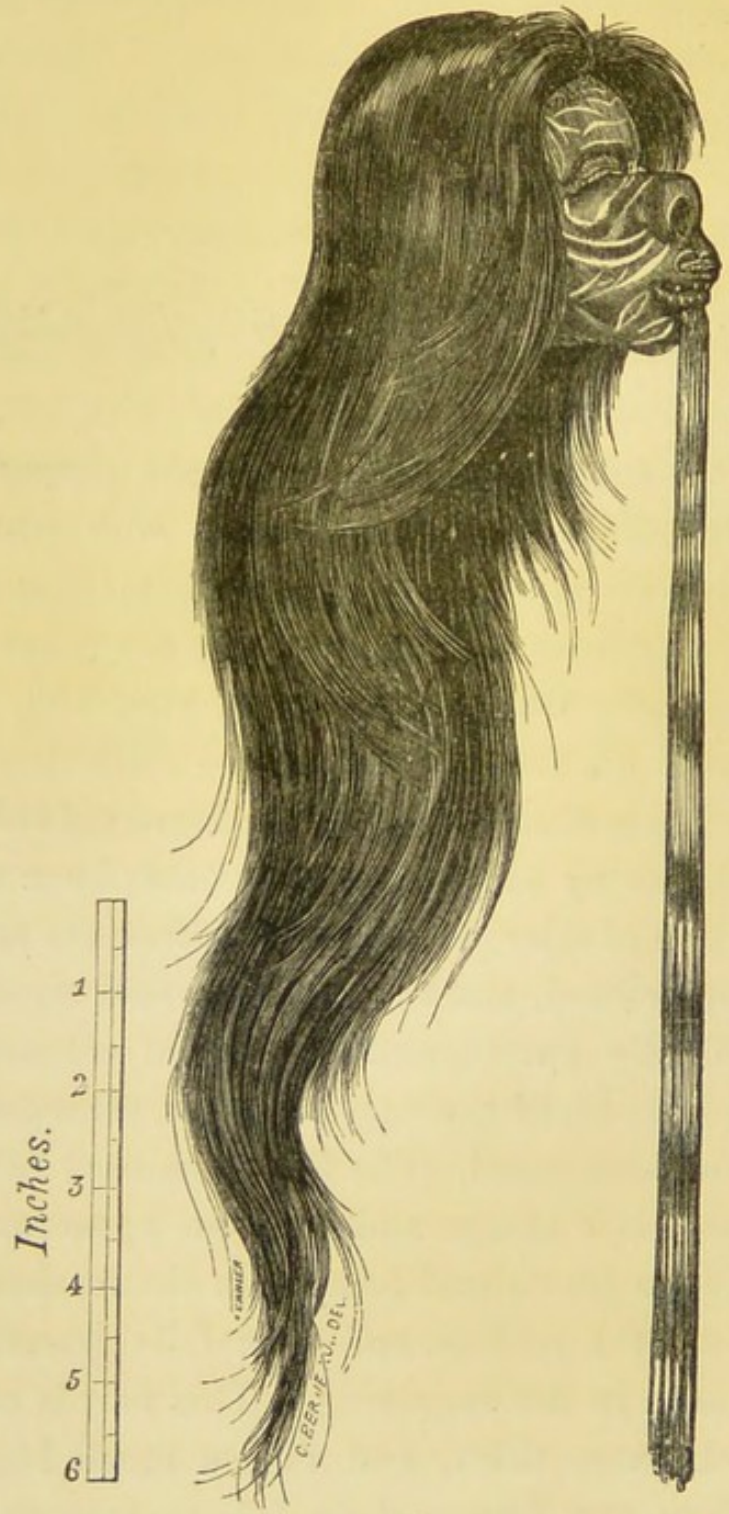
I recollect once when at Oxford the prize poem for the year was "Australia." A conceited undergraduate wrote the following introduction to his poem, which he was so certain would gain the prize that he rehearsed it privately from the public rostrum in the theatre, where he was overheard to express himself in the following verse :—

"I love to climb the lofty hills and view
The untamed pastures of the Kangaroo;
Or, mid the gum trees' aromatic blossom,
To watch the gambols of the young Opossum."

HEAD OF INDIAN FROM SOUTH AMERICA.

Among the many strange and curious preparations of the remains of our fellow creatures with which I am acquainted, there are none more remarkable than the dried heads of the Indians of Ecuador. By the great kindness of Mr. Jamrach, dealer in animals, etc., 180, George's Street, East, I am now enabled to give a drawing of one of these most interesting preparations. It consists of a human head which has by some process or other been shrunk to about the size of a large orange. The features are perfect, the eyes are closed, and the eyebrows still remain. The lips are slightly parted, and threads of coloured cotton have been introduced through both lips, arranged so as to form a pendulous tassel. The face is painted with streaks of red, giving it a savage and ferocious appearance. The hair springs in its natural form from the forehead. It is parted down the middle, and then falls gracefully backwards, as seen in the engraving. This hair is of a raven black colour, very thick, and with a much higher gloss upon it than any human hair I have ever seen in the shops of London dealers. The total length of this hair is twenty-eight and a half inches. The measurements of the head are as follows:—From the roots of hair on

forehead to nose, 2 inches; nose to chin, 2 inches; from



HEAD OF INDIAN FROM SOUTH AMERICA.

ear to ear (measuring across the nose), 5 inches; width of mouth, $1\frac{1}{2}$ inches; length of ear, 1 inch. Mr. Berjeau,

the artist, has, at my suggestion, drawn a carpenter's rule by the side of the head, in order to give an idea of the proportionate size of this most interesting preparation.

There can be no doubt whatever that this is really the skin and hair of a human being. The head is perfectly hollow, and the skin is as hard as, and about the thickness of, thick pasteboard; the skull is entirely absent. No seams are perceptible in the features, although a cut may be discovered with the finger in the thick skin which carries the hair. The story is that the whole skin of the head is present, and that it is simply shrunk to its present size by some process unknown to English medical men. The only way that I can imagine it to have been prepared—and I have experience in matters of this kind—is, that the process of slow and careful drying by hot sand was adopted; but still I fancy that this process would have impaired the permanent beauty of the hair. I must, however, confess, that a great deal of dexterity and ingenious manipulation has been employed in a manner of which I am sorry to say I am at present ignorant.

In the Exhibition of 1851 there was a head of this kind, of which I have a photograph; the owner asked me a fabulous price for it. About a year since, I examined another of these heads, kindly submitted for my examination by Chevalier A. J. Ricci, Financial Agent to the Portuguese Government; and I believe Mr. Bartlett lately had one in his possession for a short time.

A correspondent has kindly directed my attention to an article by Mr. Bollaert, F.R.G.S., in the "Intellectual

Observer" (vol. i., 1862), in which much valuable information is given respecting the human shrunken head I have figured:—

"On the eastern side of the Republic of Ecuador, formerly known as Quito, lives a tribe of Indians called Jivaros, a strange, wild people dwelling in the midst of a most beautiful mountainous country, rich with tropical vegetation, and dense forests, and including in its wild grandeur the volcano of Macas.

"Their history is given by Velasco, the historian of Quito, together with an account of their conspiracy against the Spaniards in 1599, an outbreak which procured for them the title of Araucanos of the North.

"The Jivaros are a warlike, brave, and astute people. Their bodies are muscular; they have small and very animated black eyes, aquiline noses, and thin lips.

"One of their prominent customs is to deify the heads of their prisoners. This fact has been known for some time, but only lately have any specimens been obtained. The first was brought to Europe by Professor Cassola in June, 1861, and was exhibited to a few persons in London. This had been stolen from a temple on the river Pastasa. At the latter end of the same year another specimen fell into the hands of Don R. de Silva Ferro, Chilian Consul in London, with an explanatory document, which has been translated by Mr. Bollaert, and communicated to the Ethnological Society.

"These curious trophies are thus prepared:—After a war the heads of the victims are cut off, the skull and its contents removed, and a heated stone (it is said) is introduced in the hollow of the skin, desiccation goes on,

and it is reduced to about one-fourth, retaining some appearance of the features.

"A feast ensues, when the victor abuses the head roundly, to which the head is made to reply in similar terms, the Indian priest being the spokesman for the head, or 'chancha' (an Indian name for a sow), and he concludes his part thus:—'Coward! when I was in life thou didst not dare to insult me thus; thou didst tremble at the sound of my name. Coward! some brother of mine will avenge me.'

"The victor at this raises his lance, strikes and wounds the face of his enemy, after which he sews the mouth up, dooming the idol to perpetual silence, except as an oracle; questions being put to it when the inquirer is under the spell of a narcotic.

"A double string is attached to the top of the head, so that it may be worn round the neck. The lips are sewn together, and a number of strings hang from them, the use of which is not apparent."

I think my readers will agree with me that this dried head is a most valuable and interesting curiosity.

AN OLD MAN-OF-WAR'S-MAN, ROBINSON CRUSOE.

It may be recollected that in my "Curiosities of Natural History," I some years ago published an account of "Robinson Crusoe" an old man-of-war's-man whom I found fishing by the Spit Buoy, off Southsea. One day in 1873, being in Hampshire on duty, I visited Portsmouth in order to make inquiries after my good old friend "George," *alias* "Robinson Crusoe."

While waiting for the floating bridge which goes over to Gosport, I asked a very civil sailor in command of the *Sappho*, an iron steam-launch, if "Robinson Crusoe" was still alive. "If you mean old George Butler," he says, "he is well, and as hearty as ever. I have known him these forty-three years, and he don't look a bit older than when I was a boy. His great friend and companion (whom they called Uncle), died last year, and they say he was 104."

An aged flyman in Gosport said he could take me to "Robinson Crusoe's" (or, as he called him, "Mr. Butler's") house. On arrival I found it to be situated in one of the poorest lanes in Forton, the outskirts of Gosport. The appearance of his cottage was that of extreme poverty.

His daughter, however, kept her three children exceedingly neat and clean. I am sorry to say her husband, who was in the Marines, had lately died of diseased heart, so that poor old "Robinson Crusoe" has an extra call on his already limited means. When she saw me she cried out in a shrill voice, "Father!" "I'm a-coming," said the old chap; and down he came from the room in a moment. The old man knew me instantly. He staggered back for a while, and then, waving his wooden stump of an arm, fairly cried with delight.

"Why, Lor' bless me if it ain't my old master, Mr. Buckland! I'm downright glad to see you again, that I am. Will you go out a-fishing again along with me?"

So I made him jump into the fly, and drove him down to the beach amid the cheers of his neighbours.

"Well, George, how are you getting on, and how old are you?"

"Well, sir, thank God! I am hale and hearty, though I was born in the latter part of 1801. I have had nine years and thirteen months' sea servitude. There was thirteen months in the year in them times, and they call them "King's months," and all that time I was fetching money home to the country, and a looking after piratical vessels. I served in the *Hind* frigate, tender to the *Royal Sovereign*, in George the Fourth's time. Lord John Churchill was captain of the *Hind*, and I was with him seven years. I come out of the *Naiad* frigate to join the *Hind*, and the first part of my time I was in the Mediterranean and the Archipelago, a looking after the Greeks and Turks; a cruel set of scoundrels, them fellows, but we English has been just as cruel. The

Turks are honest sort of chaps tho'. If you give 'em a gold watch you'd have it back again in twelvemonths ; but them Greeks is born thieves. I wouldn't like to lay and sleep with my mouth open when there was a Greek about, for he'd try and steal my teeth out of my head. When we was off the coast of Barbary in the *Naiad* frigate, we see'd a merchant brig making signals of distress, so we went alongside, and a precious rum cargo they had got aboard. There was nearly four hundred pilgrims, all stowed in bulk, one on top of t'other, like salt fish. They'd got cowls on, and looked like a parcel of half-sheared sheep. 'Where are you going with them scarecrows?' our Captain sings out, 'they will all be suffocated.' So we took a lot on 'em on board, but we wouldn't let them go below, as they was devoured with warmint. If we touched 'em, we see the warmint a flying off on 'em like a flock of pigeons. So the Captain gives his orders, and every day we scrubs 'em down with holy-stone and sand and the ends of old swabs, and we often wished 'em moored alongside their prophet, Old Mahomed. They was forced to like the cleaning, or we would have hove 'em overboard. There was pork served out for these chaps every day, but they wouldn't eat it, so we men got jolly good snacks out of 'em; they was going to Mecca to worship the Prophet."

"Had any fishing lately, George?" said I, as we passed a wheelbarrow with fish upon it. "I don't call them 'ere fish," he says, "they are blue, dandy-grey-russet, and all sorts of colours. Them things was ketched in the North Sea, and when they've been knocked about for a week, and put in the sun for a couple of days,

why then they are capital. We had a rum fish come into Gosport Harbour not long ago; it was the curiostest fish I ever see, and I have seen some curious fish in my time; he was uglier than a "Pocket fish," and had two paws just like a Christian. I couldn't send him up to you, though I know'd he was a 'Curio.'"

"Did you ever see a sea-snake, George?" "There ain't no such a thing, sir. I knows what a sea-snake is. They are a lot of blubber-like things of a yaller colour, and about as wide as a small oyster; they hangs on together with their claws. I see'd lots of them off the Western Islands. They ain't Portuguese men-of-war, I knows them well. If a Portuguese man-of-war got you in the water, if he got all his rigging round you, he would sting ye to death. I caught one floatin' at the back of Gosport Hospital, he touched my finger with one sting of his rigging, and it burnt for two hours like hot wire. At that time a great many Portuguese men-of-war came into Portsmouth Harbour and was thrown up on Southsea beach."

"Did you ever see any big cuttle-fish, George?" "There's three kinds of scuttle-fish, a squid, a scuttle, and a sucker. I've seen a squid just before we come to Callao; he weighed, I should think, two hundredweight; at all events, it took four or five men to haul him aboard the boat. You could see to read a newspaper through his backbone. A gentleman give me a glass of rum for his backbone, it was so pretty. When I was in the *Rattlesnake*, in the Gulf of Wynymas, I ketched another big squid; that's the chap that's got ink in him; his eggs is naturally white, but he dips 'em in the ink to deceive

people. I think he'd better leave 'em white. It puzzles me how he can threddle his eggs on to a blade of sea-grass.* The fellow I ketched with the hook was about four feet long, and thirty-four inches round; if he had been full of ink, he'd a blinded all the chaps in the boat, and we should have had to have painted the boat, for the

* Mr. Henry Lee writes:—Robinson Crusoe unconsciously touched on some very interesting matters relating to the history of these animals. "It puzzles me," he says, "how he (the sepia) can threddle his eggs on to a blade of sea-grass." Yes, and the question which George Butler thoughtfully cons over in his mind is one which, to answer completely, would puzzle many who pretend to more knowledge than he. Those who know most about it will most readily admit that we have much to learn on this subject. We know, however, that each of those eggs, which are so like black grapes, are laid separately. It has a flexible stalk, looking and feeling like india-rubber. The mother takes a turn with this stalk round the stem of the twig or sea-weed to which she wishes to attach the egg; the india-rubber-like material is soft and sticky when first laid; and so, instead of splicing the loop, she brings the end round to the base of the stalk, close to the egg, and cements or welds it there into a solid ring. Thus the eggs are "threddled" one by one. Sometimes the stalk of one is fastened round that of another, and occasionally the process is repeated until the whole mass is made up in this way, without any central stem. The work is as well and as neatly done as if skilled hands had been employed on it, but how the mother cuttle fish effects it I believe no one knows.

Mr. Buckland's old friend also says of the sepia:—"His eggs is naturally white, but he dips 'em in the ink to deceive people. I think he'd better leave 'em white." For more than 2,200 years, and for how many centuries before that it is impossible to say, this supposition has been handed down from generation to generation in manuscript, ages before printing was invented, and from father to son in oral tradition. Aristotle, who was in his prime 350 years before the Christian era, wrote that the sepia fastens her eggs, near land, upon sea-weeds, reeds, and other bodies which may be found on the shore, and even around sticks and faggots placed there for the purpose of entrapping her. "She does not lay them all at once," he says, "but at several intervals, the operation lasting fifteen days; and after the oviposit is completed she sheds her ink upon them, which turns them from white to black, and causes them to increase in bulk."

ink is awful stuff to stain; as it was, the old squid throwed a couple of gallons of water over the men in the boat. He would have held over a gallon of ink if he had been full. A sucker is very bad to meet in the water; you see a man hasn't much power in the water, and if the sucker gets some of his suckers round a man, and holds on to a rock with his other suckers, he will drownd him in spite of fate."

"Well, George, what do you think of the ironclads?"

"I don't think nothing on 'em, they're only fit to bide in Portsmouth Harbour. As for the *Captain*, when I first seed her come out o' harbour, I paddled my boat alongside, and I could look right on to her deck out of my boat; the decks was no higher than this 'ere beer-barrel, and I says to myself, 'She'll be a coffin to the men in her.' Those big transport ships ain't no good neither. When they makes bad weather they *makes* bad weather, and rolls dreadful; their sides is as straight as a wall, and there's no ballast to ketch 'em. I like wooden ships, like the *Victory* and the *Duke of Wellington*, or the *Lord St. Vincent;* they're as stiff as a house, and some of 'em will steer like a pleasure boat. Them Dutch galliots are good sailers; there's no fear of them things sinking. When it comes on to blow, the Dutchman lashes his helm, battens everything down, and when he wants to look out, pops his head up a wooden funnel, with a red nightcap or the top of an old stocking on his head, like a chimney-sweep. They stand a good chance to be run down; but then the Dutchman makes too much noise to be run over. Talk about noise—why the guns in the ironclads would make a man deaf and dumb, and turn him pretty near inside out. When I was in action I've been as deaf as a

block for a week after. It's a pity to see these beautiful wooden ships, the pride and flower of England, lying idle in the harbour, and so I would tell the Queen, or the Lords of the Admiralty. Ironclads have no business with masts; if the foremast goes, away goes all three on 'em. The men below will be smothered in the rigging, and the sails will kill 'em; and the masts don't add to the speed. They must have more coals to drive the masts along against the wind. You can't carry an umbrella to windward as well as you can walk by yourself. They're a lubberly set altogether. What I like is a 28-gun ship, like the old *Rattlesnake*. She was just such another as the police-vessel now in the harbour; she'll ride as dry as a bone; you might lash your helm, and all hands go to sleep. I don't think much o' them forts neither at Spithead. Them forts 'll bury themselves in time, even if the bottom was made of solid iron. I knows rocks at the back o' the Hospital which have buried 'emselves in my time; and it stands to reason that the forts 'll bury themselves too. But it may be a century before they do it. *Never* is a long day. Instead of building the forts, they ought to put guns all along the Isle of Wight. Ships would pass the forts in ten minutes, and then they can only rake 'em when they're at Spithead. I'd get into Portsmouth Harbour any night with the *Duke of Wellington* if I could see the lights, for I knows every inch of the ground, and the soundings to an inch; I've fished it too often not to know. If they had guns in the Isle of Wight they could blaze away at 'em at both sides; and 'tain't every ship that can fight both sides at the same time."

"Have you seen the Shah, George?"

"No, I ain't seen him, but I've been near his country, up in the Persian Gulf. I suppose the English is civil to him, because they wants to keep back 'Johnny Doby,' as we calls the Rooshians. We calls the Frenchmen Johnny Crapaud. I reads a good deal, sir, in the winter time; anything as I catch hold of. I likes history, and I reads Roman history and Young's 'Night Thoughts.' I see the top of the Forum at Rome once, when I was with a boat's crew going up the Tiber. If I'd only had a shilling for every dead man as Tiberius chucked into that 'ere river! Them Roman Emperors were nice fellows; they'd ought to have an ironclad to give 'em a rise. There was an Emperor as used to feed his lions and tigers with poor people. I think his name was Caligula, and when there was no more poor people, he used to heave in all the old men and women for sport for Ladies and that. I read a pretty Persian story the other day, all about a simple shepherd, Ali Bad. The king says to the shepherd, 'Come with me to the city,' and he goes, and they tries to turn him out; and then the king orders these 'ere fellows' heads to be cut off, and he made the shepherd prime minister. That's a Persian yarn, and a very pretty yarn it is. There's not a poor man in Gosport as reads more books than I do. I likes travels, history, and geography, and I can go through Holy Writ, especially Judges and the Prophets; but we ain't got the rights of it yet, and I suppose we never shall, as all this must have been written on wood, or else the papyrus as they gets out o' the river.

"I'm very fond of a hargument, and the Gosport people often comes to me to settle disputes."

"Have something to eat, George?"

"Don't mind what it is, sir; meat's awful dear! I has to pay a whole day's pension to get a pound of meat; and I don't get a pound of meat in two months. My daughter buys a jemmy's head, and it lasts us from Saturday to Wednesday—half a week. Chewing tobacco has saved many a man's life, as I knows. If a man was wrecked, him as chews would last twice as long as him as doesn't."

"Ever seen a whale, George?"

"I saw one once, sir, when I was in the *Rattlesnake*, off the coast o' South America. The whale come up between the ship and the boat. 'Twas the 'andsomest fish I ever saw; his skin was blue like a bottle, and his belly was whitish, and he had a lovely tail. He was alongside of us for two hours, and the captain give orders, 'Don't you harpoon that 'ere fish;' for he was a 'andsome-made fish, and I allow he was sixty or ninety feet long. He'd come to the ship to get clear of a thresher; we seed this thresher a-driving at him, and his fin come down on him like the side of a house.

"I've seen lots o' things I'd like to tell you about another day. But I see you're in a hurry to go."

So I jumped into a cab and took old George up to the station. He said he "hadn't been aboard of a fly for thirty-two years." When I got to Portsmouth Station, the old man, who had never seen it before, opened his eyes with astonishment, and said, "Mr. Buckland, sir, I'm —— if I don't think I'm cruising along with you in a foreign country," so mightily astonished was he at the phenomenon of a railway-station. Old George says

he is entitled to 4*d.* a day more pension now that he is over seventy years of age. I have placed his case before the authorities at the Admiralty, and I am happy to say they have now increased his pension.

In the meantime, this fine old man-of-war's-man is very poor, and if any of our friends would like to send me something towards making him comfortable in his old age, I shall be very glad to forward it. Nor must I forget to say that Robinson Crusoe is very badly off for books, and any present of books or periodicals will be very acceptable; he can see to read in the sun without spectacles. He has only got one arm, and he thinks the other is getting withered through sculling his fishing-boat about so much, and I should be sorry that a fine old sailor like this should end his days in anything like distress. His address is, "Robinson Crusoe," 3, Willow-place, Mill-lane, Forton, Gosport. Visitors to Portsmouth should send for him to take them out fishing: he is sure to show them first-class sport, and he will make one ill with laughing at the dry way in which he spins his numerous yarns.

HORSE-FLESH DINNER AT THE LANGHAM HOTEL.

I WENT to the horse-flesh dinner at the Langham Hotel on February 29th, 1868, without fear or prejudice, and came back from it a wiser and a sadder man; and, as I lighted a post-prandial cigar at the door, I exclaimed with Æneas of old, "*Equo ne credite Teucri.*" In my opinion, hippophagy has not the slightest chance of success in this country; for, firstly, it has to fight against prejudice, and, secondly, the meat is not good. I gave it a fair trial, tasting every dish, from the soup to the jelly. In every single preparation of the elegant forms in which it was served (however nicely it might have been sent up, with sauces, &c.) an unwonted and peculiar taste could be recognised. The chief result aimed at by the supporters of hippophagy is to provide a cheap food for the poor; in this respect the experiment must prove a failure. I have talked to many people of this class upon the point. The abhorrence expressed at the idea was very great, and this especially among the women, who would "as soon think of cooking a cat for their husband's dinner as cooking a bit of cat's-meat." No class of persons are so quick to

find out what is good and nutritious food as the feminine part of the population :—witness the quality of provisions sold in the "poor man's market," as I call it, every Saturday night in London; and I feel convinced that if the flesh of the horse contained within itself the proper elements of good and cheap food, the working classes would have found it out long since of themselves, without the necessity of a number of gentlemen meeting together to show them the way.

During the dinner, photographs of the horses which we were eating were handed round, and the appearance of one of these was, I think, the turning point of the argument. My personal experience leads me to vote against horse-flesh as a food for the public in England. Doubtless, for starving travellers, such as hunters and trappers in the "far west," for cavalry troopers separated from their commissariat, or others living and sleeping for many weeks and months in the open air, horse-flesh would afford fair and nutritious food; but in this country, as long as beef and mutton are to be obtained, coarse meat, such as horse-flesh, will never become popular, even though it be christened by the elegant name "Hippocreas."

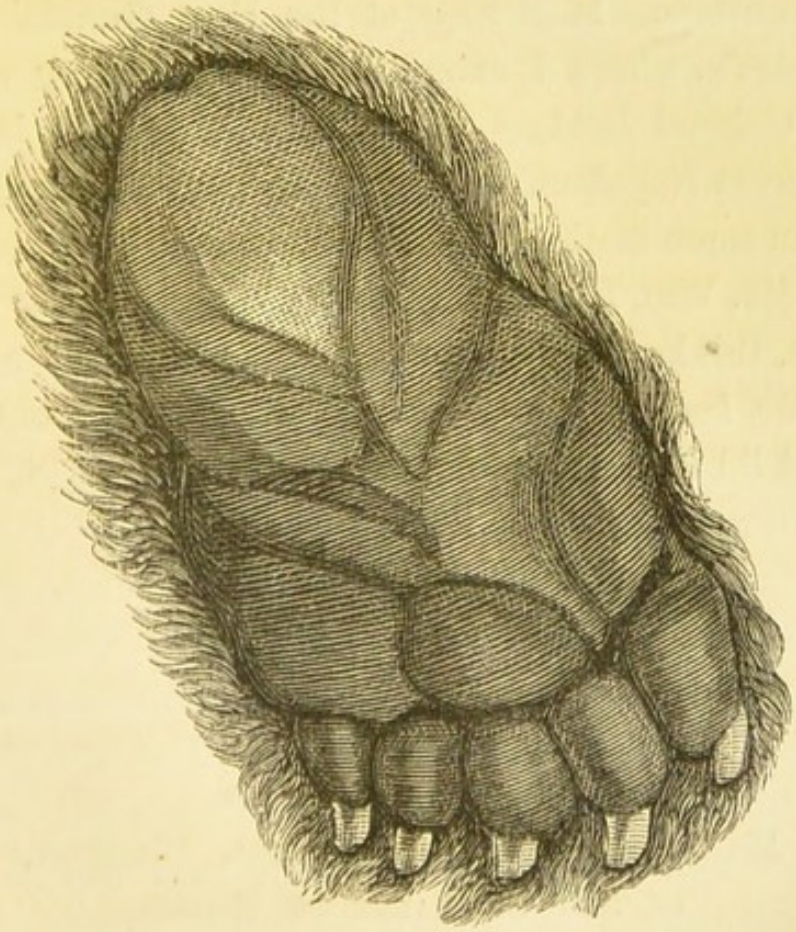
Apropos of horse-flesh, Mr. Bartlett tells me that formerly they used to feed the lions at the Zoological Gardens upon joints of the best beef. The keepers gave out that the lions, &c., would *not* eat horse-flesh. It was observed at the same time that the lions looked very thin and the men very fat. Mr. Bartlett determined to try if the lions would or would not eat horse-flesh: and he found they liked it quite as well as beef. So for the

future he ordered the lions always to have horse-flesh for their dinners. The consequence was, that the tables were turned: the men got very lean, and immediately the lions began to get plump and fat; the reader will easily guess the meaning of this remarkable phenomenon.

At the horse-flesh dinner a bear's ham was served up, and it really was very fair eating. It was one of two bears' hams that had been sent over, and I cannot resist giving the history of the second ham. A reverend friend of mine residing at Great Grimsby had bought it, with the foot attached, at a store in that town, the shopkeeper having intended to sell it to the Baltic sailors who visit Great Grimsby. My friend found it too large for domestic consumption, so he thought he had better remunerate himself by doing the handsome thing, and sending it away as a New Year's gift. He therefore forwarded it to friend No. 1, who with generous haste forwarded it to friend No. 2. Perplexed at the present, No. 2 sent the foot to a "scientific man," who pronounced it to be *the foot of some savage*, whose tribe he had not yet discovered; so it went again on its travels to No. 3. In the meantime a note that ought to have accompanied Bruin's "poor foot," which was really very human in appearance, came to No. 2. The foot arrived unexplained at the house of his recently married friend No. 3, who opened the Howell-and-James's-like box, when lo! the withered foot—no mere print, like that seen by Robinson Crusoe on his desert island, but a dread reality. With due presence of mind the inspector of rural police was promptly summoned, and this intelligent official, "from information which he had received," declared that it was a man's foot, and *that he*

knew the man who had lost it. Then came another adviser, who, quite agreeing with the verdict that it was a human foot, proposed that it should be decently interred in a proper locality, and it would actually have received a burial if the letter of explanation had not arrived from No. 2 in time to put a stop to the ceremony.

I must say a bear's foot is amazingly human. I have the cast of the sole of the foot of a monster bear that died at the Zoological Gardens on Derby Day, 1864. The bear measured, when standing upright, nine feet. The foot is twelve inches long and six inches wide at the widest part. I have painted the cast which really is now very like a nigger's foot.



BEAR'S FOOT.

FOOT OF NAPOLEON'S CHARGER.

I SHOULD like in this place to put on record some remarks on the hoof of Napoleon's favourite charger. There is in the possession of the Household Brigade a horse's hoof, polished, shod, and mounted so as to do duty as a snuff-box. It is kept at the Foot Guards' mess at St. James's, where I examined it when dining with my friend Colonel Bridges of the Grenadiers. It is a hoof of the great Napoleon's favourite charger Marengo. There has been some doubt expressed as to which foot it belonged to, but Mr. Wm. Hunting, M.R.C.V.S., with whose opinion I agree, thinks its form leaves no uncertainty as to its being *the hoof of a right hind foot.* On the outside of the gold lid is the following inscription:—

HOOF OF MARENGO,
RARE CHARGER
OF
NAPOLEON,
RIDDEN BY HIM AT
MARENGO, AUSTERLITZ, JENA, WAGRAM,
IN THE CAMPAIGN OF RUSSIA,
AND LASTLY AT WATERLOO.

As the battle of Marengo was fought in 1800, we may conclude that this wonderful charger was at least about twenty years old when ridden at Waterloo. An inscription on the inside of the lid tells us the hoof was—

PRESENTED 8th APRIL, 1840,
BY
H. W. ANGERSTEIN, CAPN. GRENR. GUARDS,
AND LT.-COLONEL
TO HIS
BROTHER OFFICERS OF THE HOUSEHOLD BRIGADE.

Round the outer margin of the shoe—a silver one of the form usually applied to fore feet—is the following: "Marengo was wounded in the near hip at Waterloo when his great master was on him, in the hollow road in advance of the French position. He had been frequently wounded before in other battles."

Mr. Hunting writes:—"Colonel Bridges told me that the skeleton and other hoofs were to be found at the United Service Institution. I found the skeleton and two more hoofs, a fore and hind one, both of left feet. Probably, therefore, an off fore-foot is still in the possession of the late Col. Angerstein's family. The skeleton is that of a very small animal, and agrees with what an attendant told me, that Marengo was a barb about fourteen hands high. I also learnt that he was purchased by Colonel Angerstein, at the sale of Napoleon's effects in Paris, and kept by him till he died of old age. The tradition that he was used by his last owner for stud purposes I do not believe. The frequent wounds referred to in the inscription on the shoe have left no mark of injury on the bones. The spine of this animal is arched like the back of a frightened cat, his

pasterns are in a straight line with his shank-bones while his hocks are bent like a cow's."

It appears that the hoof of another of Napoleon's chargers exists. Mr. Richard Bell writes:—"Mr. Hunting's letter, in which he gives an account of Marengo's hoofs, brought to my recollection the hoof of another charger once ridden by Napoleon, which is now in the possession of Miss Douglas, Dovecot Street, Hawick. At first I thought it might possibly be the missing one required to make up Marengo's complement; but, upon inquiry, I find it belonged, I presume, to the *immediate* predecessor of that famous animal. It also is formed into a snuff-box, mounted with silver, and bears on the lid the following inscription:—'This is the Hoof of Napoleon's Horse, which was killed under him during the Egyptian Campaign of 1798. From Captain W. Sleigh, late 100th Regiment, to Dr. Douglas, Hawick, 1817.' Miss Douglas's father was a doctor in the army, and met Captain Sleigh during the American War, in the early part of the century, and having extracted some bullets from the Captain's body, warm friendship commenced between them. It was owing to this that the interesting relic became an heirloom of Miss Douglas's family. Another hoof of the same animal was, I understand, given to the Duke of York, and it would be interesting to discover in whose possession the other two now are, as I have no doubt they were all carefully preserved. The one I speak of struck me as being that of a very small animal for a charger, but it was probably a barb like Marengo. Barbs of fourteen hands must have been light chargers to be ridden by Napoleon, who, I dare say, rode no light weight."

FISH AT GREAT GRIMSBY DOCKS.

EXPERIENCES OF A NORTH-SEA TRAWLER.

I HAVE had the pleasure of a conversation with Mr. Hill, late Captain of the trawling smack "Hurricane," which sails from Great Grimsby.

Captain Hill's conversation was so interesting that I now give my readers the benefit of his experience, as far as possible in his own words.

"I have been knocking about the North Sea for nearly two-and-forty years, and I fancy I could find an orange if it was moored in the part of the sea where I am used to work. There ain't finer craft put upon salt water than our North-Sea trawlers, and we are never afraid of nothing, our eyes is always on the look-out day and night; there's no stowing away under the lee of the long-boat; we stands and face it 'as Jeffrey faced the cat:' no men who goes to sea keeps a better look-out than we do. The 'Hurricane' has been in every gale of wind that has blow'd on the North Sea for the last six years, and that's as long as she has been built. She has never exempted any gales at all; she has been through December gales and all, and she has not lost a pound's worth of bulwark

all the time. I never knowed her to blow away her jib ever since I belonged to her, and she will come about in any weather, and will twist about like a top; anyhow, I know what she can do and what she can't do, and I can make her talk a'most. No big ship can do what we trawlers can do, and we have to alter for every ship. If there is a bit of a popple at all, a big ship will lay rolling about in the sea just like a 'half-tide rock,' while our little things are dodging about like ducks, and the 'Hurricane' is as upright as a house. The seas are sometimes terrible high, we can't see a great three-masted ship a mile away as she falls in the bend of the great waves.

"We trawlers save many a ship's crew from wrecks; four ships' crews were brought in this season, and we get nothing at all hardly for our trouble. As for English crews, we never get a halfpenny; we sometimes get something from foreigners, for the foreign King often sends us over a medal or something. I lately saved a ship's crew in my smack, and had to leave my work for six days to deliver that lot at Yarmouth, and what's more, we had to grub 'em all the time. When we first picked 'em up, the Captain, he cried and promised all sorts of things, what he was a going to do, but I never got as much as a pin's point; I never heard anything more about this captain, or his men either, after they once got safe ashore. I have scores and scores of times seen ships laying without a stitch of canvas up; but if there is anything in distress in sight, we never leaves 'em; for we likes to save life if we can.

"We know our way about the North Sea well; the sun

gives us our latitude, and our longitude is our lead: we know every mile of the ground, by the cast of the lead; the soil which comes up on the grease at the bottom of the lead, tells us where we are, and that's how we works the oracle, if there ain't no sun. Sometimes we never sees the sun, nor nothing else for a long time. Yet we keeps our course, and don't get a mile out of the line, one way or the other.

"We trawlers often lose our nets on wrecks at the bottom of the sea; the 'Hurricane' lost hers last voyage; it caught on a wreck on a Sunday, and we rode to it as to an anchor till ten o'clock on Monday night, and then the warp parted; we lost the whole kit and seventy fathom of rope, and it will cost a tidy lot of money to replace the gear. About eight hundred sail fish the North Sea; they come from Scarborough, Hull, Grimsby, Yarmouth, and other places. We can begin trawling fifteen or sixteen miles from Spurn Point, and there is smooth sand as fine as silk from Spurn Point to Horn Reef, forty miles to the east of Heligoland, and also right across to Norway. The trawling ground is so big that these eight hundred trawlers are nothing to the space they have to fish, and sometimes we do not see any vessel for hours, although they're all on the fishing ground.

"Our trawl-beam is 42 feet long; the foot-rope is 84 feet long, and 15 inches round; the smallest mesh of the net is 2½ inches. The trawl is down about six hours, more or less, and in the summer from dark to daylight. We work in thirty to forty fathom water in winter; in summer we work in shore from twenty-six to twenty-eight fathoms of water.

"We consider from fourteen to fifteen ton of fish a fair catch, but the catch depends very much upon the weather. If the weather is fine we should catch double that number of fish. It's a'most always either a calm or a gale in the North Sea. If it is very bad we lays-to till the right weather comes, but we often fish in very bad weather. There is not much current in the North Sea.

"I can give you the list of the catch of one trawler as follows:—Seventy kid of haddocks (two hundred weight in each kid)—five score of turbot—forty boxes of plaice—two boxes of soles—twelve score of cod—and four very large sturgeons. This was exactly her voyage, and she was gone eleven days. I have known another vessel bring in as much as one hundred and ten kid of haddock, but she was gone a few days longer. We pack fish and ice together. We never use the same ice twice, and ice is often very expensive. It costs from three to six pounds every voyage.

"In the winter time the fish are in the deep sea; in the summer months there are few fish in the middle of the sea. The cod spawn about March, in deep water in the Swatchway, at the Doggerbank. In May and June the soles, plaice, etc., leave the deep water and go to the German shore into from nine to fourteen fathoms. I have often seen the spawn run out of the fish when taken out of the net, but never saw this out in the deep sea.

"I never saw anything like spawn or young floating on the water. I have read the accounts in *Land and Water*, *and I must say I hold with a proper close time along shore.* I have been forty-two years fishing in the North

Sea, and there are now as many fish there as ever there was. I don't see no difference.

"The boats that fish along shore should come to sea, as they ought to do, and fish fair. I should not be surprised if the brood was very soon spoiled and destroyed by small-meshed nets within the three-mile limit from the shore."

This part of Captain Hill's statement is of great importance—it quite agrees with my own ideas, viz., that the times and places of the spawning of sea fish should be ascertained by gentlemen who are perfectly competent to undertake that office; and that a close time for sea fish along shore should be fixed according to the facts so ascertained. Captain Hill's evidence that the flat-fish leave the deep waters, and migrate for spawning purposes towards the land in the summer time, is quite in accordance with the results of my own already recorded observations. It is in these comparatively shallow waters that small-meshed trawl nets are used in the summer months, and doubtless destroy the young fry in tons.

As the efforts of salmon protectors are directed to guarding the spawning fish, and preserving the fry, so should the efforts of sea fish protectors be directed to these same important and vital points in the interest of the sea fisheries.

"We keeps a good look-out for steamers at night: if the trawl is down we are done for, we can't then shift for the steamer. When the trawl is down we carry a light at the masthead; and if we see the steamer coming too nigh, we light a large 'flare up,' like a bonfire, that they may see which way our head is, and steer clear of us.

"The steamers look out for us, not we for them. They make a terrible noise with their whistles, and we can hear 'em a long ways off—three or four miles. If there is any possibility, they keep out of our way; but we had a narrow squeak* once in a fog. We could have stepped

* A "Steamship Officer," Mr. W. Jones, late of the P. & O. Co., is not satisfied with this; he writes: "As far as my experiences in the North Sea go, I have sometimes found myself in charge of a big steamer amongst a lot of fishing-boats without a vestige of a light aboard any of them until within a few ship's lengths, when up goes a light just under your fore-foot, and a collision is only avoided by the utmost exertion on board the steamer. I remember on one occasion, after a 'narrow squeak' like the above, we had scarcely time to breathe our congratulations and curse the meanness and stupidity of the fishing-smack people for risking their lives and ours for the sake of a shilling's worth of oil, when the man on the look-out shouted, 'Bright light on the starboard bow,' immediately followed by 'Bright light on the port bow' and 'Bright light right ahead,'—all fishing-boats within a pistol-shot of the ship. We were then under full steam. We managed to get through the fishing vessels somehow. If I had knocked one over, the men would have sworn they had their lights up, the steamship owner would have had to pay damages, and I, as officer in charge of the steamer, should have been discharged with a blemished character.

"A steam-ship is not a huge snorting monster going about the ocean trying to run over sailing ships, or at least not trying to avoid them, for nothing is farther from the fact. No one who has not had charge of the deck of a passenger steamer on a dark night, with perhaps two or three hundred lives in his hands depending on his judgment and vigilance, can understand the anxiety attending this position, and how desirable it is to give other vessels a wide berth. But they frequently do not give us fair play, either by ignorance of, or inattention to, the rules of the road, not showing their lights, or by getting in a panic and tacking about to get out of the way—the worst thing they could do, for they thereby upset all the calculations of the steamboat officer. If small vessels could only be induced, or forced, to show good lights, and stand on regardless of steamers, collisions would not so frequently occur. This seems to me a matter in which the general public should feel an interest as well as nautical men, for why should a trumpery little vessel, as we should call them, such as a brigantine or schooner, of, say two

aboard the steamer as she came alongside at full speed. I told the captain he wanted reporting, he did; but I didn't do it. It was a vessel from Hull; I knowed who she was. The Captain asked me, as we passed, where he was, and I was fool enough to tell him. I knew where I was to an inch. A Grimsby trawler was, to my knowledge, cut in half by a steamer, and the owner's son was drowned in his berth. All the rest got aboard the steamer. The lad was asleep below when the steamer struck the smack.

"The thresher sharks just do serve out the whales. The sea sometimes is all blood. A whale once got under our vessel—the *Hurricane*—to get away from these threshers, and when she was there we was afraid to throw a rope overboard, almost to walk about, for fear she should chuck her tail and punch a hole in our vessel. She was full length, in water as clear as gin, right under our bottom, and laid as quiet as a lamb for an hour and a half, and never moved a fin. Where they had been a-thrashing of her the sea was just like blood. I have seen them 'ere threshers fly out of the water as high as the masthead, and down upon the whale, while the swordfish was a-pricking of him up from underneath. There is always two of 'em, one up and one under, and I think they hunts together, and you can see the poor whale blow up in great agitation; and I be bound the pair on 'em don't leave him until they have had their penn'orth out of

hundred tons and ten men, or less, be allowed to endanger the safety of a steamship of two or three thousand tons, carrying, perhaps, H.M. mails, millions of specie, a valuable cargo, and hundreds of Her Majesty's subjects of all classes, because, forsooth, they are too niggardly to expend the necessary oil for lamps?"

him. It's just for wengeance as they does it. Whether Master Whale has offended them or not, it's hard to tell. If they eats him they must have a tidy blow-out off of him, but I don't think they like the oil.

"I saw one engagement off the Staples; it was all two or three hours they was at it. I don't think they leave him till they kill him. We once hit a dead whale on the broadside as he was floatin' along, belly uppermost. After we hit him we was afraid he was alive, but he was the wrong way up to do us any harm. It's a pity we didn't tow him ashore, as we should have had a tidy prize. He was a tremendous big fish. He was quite dead, but didn't appear to stink. He was over eighty feet long, and longer than our vessel. Some time ago some of our fellows pitched into a whale, and got four or five tons of blubber out of him. Six of them tried to turn him over with tackles, but couldn't move him, and they cut the blubber off as he lay in the water.

"I have been in Iceland and seen the sun never set for five weeks off the reel: I had an argument the other day about it, an' the person said, 'You know the sun goes underneath;' 'But,' I says, 'I never lost sight of him, at any rate—the sun just goes down, and appears to touch the water, and then rises again.' The Iceland women are fine-looking women, but the men are poor, thin fellows; our chaps used to go and have a ride on the little Iceland ponies, for which they paid fourpence a ride. The men come over the mountains, from their huts, to the towns when the copemen (general dealers) arrives in the harbours to sell their goods from the vessel, and they get so tight that they cannot even climb on to

their ponies at night when they goes home again; and when they do get on, you should only see them see-saw as they jogs along. It ain't often they gets a skin-full, and you should hear the jabber they makes. And you can't understand them, as they talks Dutch to us—one language is as good as another. Brandy is only four-pence a quart, it is corn brandy, and cherry brandy is a shilling a quart; it comes from Denmark, and don't they get tight, that's all.

"The men take large quantities of birds from the rocks, and exchange feathers and other things they manufacture. You can see the land in Iceland sixty miles away; the mountains are very high. We went into harbour one day and saw, as we supposed, a fleet of ships coming, which turned out to be icebergs, and they drove in towards us, and some grounded in 25 fathoms of water; we were obliged to stop in the harbour two or three days; the look of the icebergs is beautiful, like chandeliers in a drawing-room; we once had one of our ships jammed up between two of 'em for forty-eight hours; the icebergs must have come adrift from Greenland.

"There are plenty of foxes in Iceland; all my daughters have muffs of the skins I have bought there; they are grey foxes; every bed I have is filled with feathers I have bought there; I paid 10d. a pound, of 18 oz. to the pound. There are millions and millions of birds about there, and on an island called Grim's Isle, about forty miles out to sea: gentlemen's yachts should go out there in the summer. I should like to get you one of them fish we calls oak-kettles;* they catches them off Iceland with

* I do not know what an oak-kettle is. Is it the Basking Shark?

a line and hook, and puts a tackle on to get them out, and the liver would fill one of your tins there (holding 2 cwt. of plaster); they weighs sometimes 4 cwt. or 5 cwt. The liver is sold for oil, and the Icelanders cut the fish up in slips, and dry them, and eat them in winter.

"I have seen nine or ten ships ashore on the Gunfleet sands, right abreast of Walton-on-the-Naze, and the greater number bury themselves in the sand, and are lost. I have travelled that part all hours of the night, and have had eight hours at a stretch with the lead; there are so many lights now that it is seldom a ship gets ashore there, and an old woman could sail a ship in the Swin. It's wonderful curious how quick a wreck will bury herself in the sand; when the water is away the sand is quite hard, when the tide is up it's all loose, and the weight of the ship drags her down, and the sands are so quick they are regularly on the move when the water gets into 'em; perhaps the ship floats out in some other country, as some people say we stands on the top of Australia.

"We was once hauling the lines off Saltfleet, and we hauled up the body of a man on one of the cod hooks, and we let him go again, and I was frightened to go below that ere night. I was only a lad then, and hadn't much pluck about me. We found out after we got to the Humber that he was a pilot that had been washed overboard, and he would have been a prize if we had took him aboard, as he had his watch and money about him.

"I have never seen a salmon jump at sea, but I have seen cods, coal-fish, and others. We catch curious fish, but many we take no notice of; some of 'em is rum-looking customers. I should like you to take a trip at sea with

me in the summer; you would require half a ship load of paper to fill up what you would see.

"I have seen plenty of seals in Iceland, and the natives catches 'em for their skins, and they eats the bodies. We couldn't eat the stuff they can. In bad seasons, when the cope vessels can't get in, they are obliged to eat their dogs, poor things, and they would pick a crumb off the table. I don't want to go to sea again if I can help it. I have been 42 years at sea, man and boy, and I have never missed a winter during all those years. The young men now are quite a different race; they are all old men before they are any age. Some is born old, and ain't got no life in them. I am as nimble as most of them, and a deal nimbler. They don't put good timber into half the sailor lads now. When I see fish in the shops in London, the price of 'em is quite different from what we receive for 'em. We fishermen never see a quarter the price for the fish you pay in London. We have all the job of catching of 'em, and have the least profits on them."

If any of our friends visit Great Grimsby, they should call on Mr. Hill. He has now got employment connected with the railway and fish trade.

About the middle of March, 1873, a favourable opportunity occurred to me when returning from an inspection in the north, to visit Mr. Hill and the docks at Great Grimsby. The most noticeable feature in Great Grimsby is an immense shed, called the Pontoon. It is about 300 yards long, and the floor of it is frequently covered the whole distance with freshly-caught sea fish, which are sold by auction on the spot to dealers. Railway vans are brought up close to the Pontoon, and the fish are sent off

daily by tons upon tons to London, Huddersfield, Halifax, Bradford, Leeds, Birmingham, Wakefield, and other large towns. Passing through the Pontoon we get a good view of the docks. Floating in the water are a great number of immense boxes, looking like gigantic dice. They measure about ten feet long, five feet wide, and four feet deep. Sometimes the boxes are so thick together that the water can hardly be seen. These boxes contain live cod, and they get renewed water as the tide goes in and out, through the holes bored in their sides. There are so many of these boxes floating about that men and boys are frequently seen walking about on the top of them, and jumping from one to the other, over a great extent of the dock. By the kindness of Mr. Thomas Evans one of these boxes was hauled up alongside a barge, and the lid opened for my inspection. The sight was most interesting and curious; there appeared one solid mass of living cod, all struggling and gaping with their immense mouths. This is a sight worth going all the way to Grimsby to witness.

In another of these boxes there was a large number of great halibuts. I had never seen a live halibut before. He is a curious looking fellow, one side brown, the other a creamy white. The cod will live in the boxes about eight weeks; they have no food given them. The halibuts will also live from eight to nine weeks. A cod weighing fifty pounds is considered to be a large fish: one was sold last year weighing fifty-two lbs. A seventy-pound cod is the largest ever known. The largest cod are caught off Cromer Knowles.

When walking round the dock I saw some men hauling

at a rope which was evidently made fast to something very heavy. When this body came to the surface, I found to my astonishment that it consisted of a solid mass of live cod, each individual fish being tied by the tail to the rope. When the fish were in the water they spread themselves out in a circle, looking like a large cartwheel without the tire, only the spokes much more numerous. When the cod were hauled up into the air they looked like a rope of gigantic onions; the poor cods' tails seemed very sore and lacerated by the string which fastened them to the rope. These cod, poor beasts! must lead a miserable life, and I think this practice of tying them up very cruel. Walking about the docks I saw some Dutch fishermen, very hardy, fine-looking men. I understand they are very clever "artists," and can catch fish when nobody else can. The Dutchmen bait with limpets, the Englishmen use lamperns, and in the cod season a great number of boys are employed putting lamperns (which are cut into little pieces) on to the hooks.

The cod, when caught, are put alive into a well inside the hold of the trawler. They are taken out by landing nets. The cod will not live long in these wells when the vessels are in the docks. A very ingenious device for picking out any dead cod that might possibly remain in the corners of the well is a kind of gaff, consisting of two cod hooks hammered quite straight, with the barbs facing each other.

There are two points requiring serious consideration in the cod-fishery. The first is the destruction of spawning fish, both male and female. The cod are killed by a blow on the head, and I was told that the deck of the

boat, when cod are being killed for the markets, is *actually milk-white with spawn*, and this fearful destruction has been going on now for years. If I understood aright, the cod are in the height of spawning about the middle of February, and this is when the above lamentable sight can be seen. Surely this must in time produce some diminution in the number of fish, and I wish I could see my way clearly as to advising legislation for the future. The cod-fishers are, I believe, willing that this fearful destruction should be stopped.

The next question relates to a fish of the cod kind, called the "sprag." Some suppose that these sprags are a distinct species of cod, and they call them "shore cod." Others say that they are simply the young of the ordinary cod. They generally run about the same size. I have now in my museum a cast of a group of these, sent up to me in the month of March; they average about fifteen inches in length, and two pounds in weight. I have been, and still am, in communication with Mr. Mudd and other gentlemen at Grimsby on this important point. These sprags fetch very little in the market, as they are said never to have any flavour in them, and are very thin and poor. The general opinion is that there should be no sprags caught between April and August, as there is good evidence to show that the sprag-fishing in the summer months affects the fishing for the larger cod in the winter months. In other words, it appears that the sprags are really young cod, which are not allowed to attain to a proper size before they are caught. The question, then, is, whether it is desirable that the sprag-fishing should be controlled. The cod have been getting scarce the last

two or three years, and something ought really to be done to preserve the fishery. The question whether sprags are really young cod or not could be easily solved by sending a live specimen to the Brighton Aquarium.

The interest of the trawlers sailing from Great Grimsby, in this question, is very great. Each trawling vessel carries usually five hands, men and boys, and there are nearly five hundred sail of trawlers working in the North Sea, and more are added every year; yet it does not appear that the supply of fish caught in *the open sea* is perceptibly diminishing, and the value of the fish caught is very great. One halibut has been known to bring four pounds sterling, and the week before I paid my visit to Grimsby a halibut* was sold for three pounds twelve and sixpence. The value of flat fish—such as rokers, skate, witches—varies very much, according to the supply; but at all events, very large sums of money change hands in connection with the deep-sea fisheries.

I was informed by some gentlemen who were exceedingly civil to me, and who are connected with the fish trade of Grimsby, that 36,300 tons of fish were sent away from Great Grimsby last year. Taking the market prices of all the fish, both the highest prices and the

* In February, 1874, an immense halibut was brought to the London market. By the kindness of Mr. Dearsley, of 1, Russell Street, Covent Garden, I was allowed to make an outline of the fish in linen, and Mr. Searle, my secretary, cut out the shape in board, and we painted it. This fine fish was 6 ft. 3 in. long, 3 ft. 11 in. wide, and weighed nearly 2 cwt. I regret I could not afford to cast him. About the same time I cut out the outline of a huge skate, which measured 6 ft. 10 in. long with the tail; width 5 ft. 3 in. Both these specimens are now at my museum.

lowest, it would appear that the average market value of a ton of fish would be £15. If, therefore, we multiply 36,300 by 15, we shall get the enormous sum of £544,500 worth of fish sent away from Great Grimsby in one year.

The general opinion seems to be that there should be a close season for sea-fish within the three-mile limit during April, May, and June; that the large trawlers do no harm out at sea, but that the smaller ones do mischief trawling close in shore at the time the fish are spawning. Some vessels go two hundred and forty miles from land before they begin fishing. I was informed that the trawling-ground may be said to extend from the North Foreland to Duncansby Head, in the Pentland Firth, and from the coasts of England to those of Norway, or about five hundred miles long, and from three to four hundred miles wide. The captain of one of the trawlers stated to me he had been out on some of the best trawling-grounds within this space, and although he had remained out at sea for nearly three weeks, he sometimes saw but one other trawler the whole of that time. It was a very pretty sight to see the trawling vessels going out of the harbour. They were towed by ropes alongside the quay, and when they got to the end of the quay, the tide—for there happened to be no wind—dispersed them over the broad expanse of sea.

During my visit to Grimsby, I was accompanied by my old friend, Mr. Hill, whose experiences I have related above. One or two of the vessels stuck in the mud going out of the harbour. Mr. Hill explained that this is not an uncommon occurrence when the men on board are

not in a particular hurry to go to work. There is an old saying at Grimsby that "it always takes a gallon of water to get a trawler *out* of harbour, but she can come *in* when there is only a pint."

In the club-house opposite the Pontoon I was very hospitably entertained by Mr. Mudd and several other gentlemen connected with the fish trade, who were kind enough to give me a list of fishing smacks.

From this it appears that there were 362 vessels sailing from Grimsby, eleven from Hull, five from Goole, two from Lancaster, one from Preston, one from Ipswich, fifty-eight from London, one from Ramsgate, and two from Dartmouth. The first name is Aello. The list is worth studying to see the curious collection of names which have been given by the fishermen to their boats. Some are classical, some are poetical, some are witty. Here are a few of them,—Luck's all, Emu, Cockatoo, General Havelock, Samaritan, Emma, Ebenezer, Jupiter, Saucy Lass, Blue Bell, Fly, It, Harlequin, Eel, Mars, Wasp, Maid of Honour, Snipe, What's-that-to-You, Mermaid, Wilberforce, British Lion, Tickler, John Bright, Dido, Moth, Waterloo, Smelt, &c.

Seeing, then, that we have no less than 443 English trawlers at work in the North Sea, and that the money value of the fish sold in one port alone is nearly £550,000 in one year, I think the reader will agree with me that the subject of deep-sea fishing is of considerable national importance, and requires further consideration from Government, especially as regards the mesh of nets, and close time within the three mile limit, during the spring months.

"LITTLE JEMMY," THE SURICATE.

In December, 1871, a Lady who was about to leave London asked me if I would like to take charge of a "Prairie dog." It was a great pet, and she did not like to send it to the Zoological Gardens. Of course I accepted the offer. When the little animal arrived home, and I turned him down on the floor out of his cage, I at once saw that he was no "Prairie dog"—the "Prairie dog" being an American animal, like a marmot—but that he was the Zenick or Suricate of Southern Africa. His mistress had named him "Jemmy," and he knew his name quite well. In general appearance Jemmy is not unlike a mongoose; he is about the size of a very large rat, and has a very pretty little head, like that of the hedgehog; his eyes are very bright, and he jerks his head about in the most knowing way possible; he was perfectly tame at once, and ran about the house, up and down stairs, with a quick, active, restless movement; he visited each room of the house in turn, and pried most inquisitively into every hole and corner, especially mouse-holes, and cracks in the floor. He always runs about my table at breakfast time, and invariably scrapes out the sugar from the basin and

the salt from the salt-cellar, with his long bear-like claws.

He has made friends with the monkeys, who have taught him to steal; and if I am not very sharp, he will drink up all the milk or else upset it; his head just fits into the milk-jug. When he first arrived I thought I would try him with an egg; so I sent the page-boy John for one, which, after a few minutes' delay, he brought up. I put Jemmy on the floor with the egg; he scratched it, then smelt at it with his pointed nose, and immediately bolted. I thought this very odd, as the suricates when at home are known to be great egg-eaters. A minute or two afterwards I found out the cause of the phenomenon, for on picking up the egg I found that it had been boiled just before the boy brought it up; it was quite hot, and of course poor Jemmy had burnt his nose when he had attempted to crack the shell with his teeth. Jemmy soon, however, made short work of an unboiled egg which I immediately sent for for him. At breakfast time, now, I always have a bother to keep Jemmy away from the eggs after they are opened, for he has learned to eat them boiled as well as raw.

It is the funniest thing in the world to see him sit up and look out of the window; he rears himself up on his hind legs, and in this attitude he looks just like a penguin, as he hangs his fore-paws down in the same position that the penguin hangs its wings. He will sit in this penguin-like fashion in the window for hours looking at the carriages and people in the street; he will also sit in front of the fire inside the fender, or at the corner of the table nearest the fire, and warm his stomach. If he has been

running about much, he will warm himself first and then go into his cage and have a nap. He sleeps with his head between his hind legs, and looks like a round ball of fur.

One Sunday night Jemmy was missing, and it was supposed that he had gone out of the front door, which had been left open a few seconds at church time. We hunted high and low and could not find him; I immediately sent up to my friend Mr. Nicks, Inspector of the Albany Street Police-station, who kindly gave the men on night duty strict orders to look out for him; so that the whole of the S division were on the look-out for little Jemmy all night. When I came down to breakfast next morning, I was delighted to find Master Jemmy sitting on the corner of the table warming himself as usual. It appears that when John the page went to bed on Sunday he found Jemmy in the middle of the bed coiled up under the clothes. Jemmy did not like getting up in the morning.

When he is running he keeps up an incessant little cry, which reminds one much of a match being scratched on a box for ignition; he can also, when alarmed, utter a sharpish bark. The lady who gave him to me said the bark of a dog would kill him, as a dog once barked in the street and he went over the side of the stairs down another flight, and was nearly killed. Strange to say, in less than two days after he came to me, he made friends first with the cat, and afterwards with both the dogs, and he now seeks them out himself at the bottom of the house. The first two days the dogs ran away from Jemmy, but now they curl up on the mat together, Jemmy finding that the fur of the dogs' long coats keeps him warm. At the first introduction the cat went up the chimney straight off.

I wish she had never come down. I cannot bear this cat. The servants call her "Mollydods." It is a French cat, and three parts a fool, and I have every reason to believe that this brute has killed my singing-mouse, which for many weeks had been running about among the boxes of sample oyster-shells behind the casts of salmon in my study. One evening I found "Mollydods" in my room, and I have never heard the poor singing-mouse pipe up since.

Jemmy has made friends with the monkeys. The "old Hag" considers him beneath her notice, and does not even grunt at him; but "Tiny" torments his life out when she is let out of the cage. The suricate's tail is a capital thing for her to pull, and she is so wonderfully quick that poor Jemmy has no chance to retaliate. One day I caught Master Jemmy sitting on his haunches, staring very intently at the old Poll parrot, and I firmly believe that he would have nipped the parrot's head off, if he could have had his own way. This bird, however,—she is a wonderful talker—has held her own against any carnivorous pet for some years; and I rather think Master Jemmy has had a taste of her powerful beak. At all events, the bird and Jemmy seem to be very good friends now. The greatest treat Jemmy can have is a live mouse. Mice are now getting scarce in the house. When a mouse is let out of the trap Jemmy has him in a moment, and kills him instantly by a nip of his sharp teeth, and sets to work and eats him up, skin, bones, and all, just as one eats a fried sprat or a roast lark. He examines the mouse-trap several times in a day. At first he used to scratch at the traps, and "throw" them; now he only sniffs

at them and passes on. In his own country I expect his especial business is to eat small rodents and the eggs of birds that lay on the ground. His claws are admirably adapted for scratching, and doubtless he digs mice out of their holes. Jemmy, for his size, must have a large brain, for he is most intelligent,—much more so than a mongoose, or other creatures of the kind. If any lady wants a nice, affectionate, interesting, domestic pet, she cannot do better than to get a "Jemmy;" they are not so mischievous as a monkey, never bite, are very playful, very amusing, and good-tempered.

One day John brought Jemmy up to me decidedly ill. He spun round and round on the floor like a mad thing. "Poor little fellow," I said, "what's the matter?" So I nursed him, and he only grunted his gratitude. I had up all the servants and took evidence. It appeared that Jemmy had gone out into the garden—a London garden—out of the open window. I saw my neighbour's gardener working, and at once thought he had struck him. On inquiry, the man (who was very civil) assured us that he had never struck Jemmy at all; but, as he was digging the ground, Jemmy followed him, and had eaten seven large lob-worms right off one after the other. *O tempora, O mores!* Enough to make anybody ill, I thought; so I brought my professional knowledge to bear and Jemmy was himself again, in spite of the "Diet of Worms."

I am sorry to say, however, that, since the above was written, little Jemmy is dead, and I am more sorry he died in great pain. I found that the cause of death was a ball of cotton-wool in his stomach.

RAT WITH HAM-BONE ON HIS NECK.

By the kindness of Mr. Taylor, the civil and intelligent official at the Waterloo Railway Station, I received, in May, 1867, the most remarkable rat it was ever my luck to behold. The poor thing has a bone collar round its neck; this collar is evidently the section of a pig's thigh-bone. It is a little larger and broader than a gentleman's full-sized finger-ring. The only way I can account for the bone being on the rat's neck—unless it was put there by human hands—is that when he was young he had been stealing and gnawing at a rasher of ham. During his work he had, unfortunately for himself, thrust his head through the ring-shaped bone, the set of his head and the size of his ears not enabling him to pull it off again. As the rat grew larger (he was about half-grown at the time I had him) of course the bone got tighter, and his neck is considerably diminished and elegantly fashionable. The neck I observed was in a considerable state of inflammation; but as the rat ran about his open wire cage, I poured warm water on it with a large sponge. The poor little animal stood still, raising himself on his hind legs, and seemed to much enjoy the ease the fomentation evidently afforded. Having fomented him awhile,

I caught him, and placing him in a cloth, operated with a sharp lancet on a swelling under the jaw, caused by the pressure of the ring. The poor thing was very much relieved by what I had done for him, and the ring seems certainly looser. By judicious treatment I had hoped to keep this rat alive with the collar round his neck, and make "a perfect cure" of him, but ultimately I thought the most merciful thing would be to kill the rat and set him up as a preparation in spirits. This I did, and the rat with the bone collar is now in my museum.

The subject of rats naturally suggests mice. The rat with his bone collar reminds me of a curious specimen I have in my museum, of a mouse caught by an oyster. The oyster is a fine, well-grown five-year-old Whitstable native, and between its shells is firmly fixed a poor little mouse, the head and shoulders of which are thus entrapped. My interpretation of this fact is as follows:— The oyster was put on the kitchen or larder floor; he then opened his shells as oysters always will do under such circumstances; and the mouse—a young and inexperienced mouse—put his head in between the shells to nibble the beard of the oyster, who instantly closed them and made the mouse a prisoner.

This reminds me of the story of the nigger, who put his tongue in between the shells of a gaping oyster, which instantly closed his shells upon his tongue. The nigger yelled famously. He was chaffed for yelling so much. "Why, the oyster has no teeth," said his friend. "No, massa," said Sambo, "he got no teeth, but by gorra he hab very hard gums."

SINGING MICE.

Now mice sometimes sing; a musical mouse has been presented to me. When first brought into my study, the mouse refused to "tune up," and looked silly and frightened. At last, all of a sudden, she put her little paws against the bars of the cage, and began singing away famously. The song is a little sharp note, uttered continuously. Translated into words, the song was something like this, "Twit a witter, twit a witter." Sometimes the mouse would sing *dolce piano* and then *forte*. The little beast appeared to me to have two octaves, *i.e.*, it could sing its song in a low key and in a high key, and change quickly from one to the other. During the performance the chest was palpitating violently, and the little cleft nose moving about, but there seemed to be no forced exertion at all. The real secret of these musical powers in the mouse is not, I believe, known. Dr. Crisp, of Chelsea, informed me that he thought the singing was caused by the presence of a parasite in the liver. I have a specimen, in spirits, of a singing mouse, in which this parasite is certainly plainly visible, but I am not at all sure that other mice also, who are not musical, have not this parasite. The song is a genuine song—as good and as

musical as that of a lark on a fine summer morning. I think we should take a rather more sentimental view of the matter, and call it a love song. Mice, I believe, somewhat resemble birds in their anatomy. Certain individual mice may be gifted with the power of a bird-like song, and I fancy singing mice are not so uncommon as they are generally supposed to be. Their concerts do not generally begin till a late period of the evening, and this may be one reason why we are not often present when the Chairman raps the warm hearthstone in front of the kitchen fire and cries out: "Gentlemen and ladies, the musical mouse will oblige next. After him, Mr. Cricket will give his celebrated solo performance on the banjo. Pray silence, if you please, for Mr. Mouse."

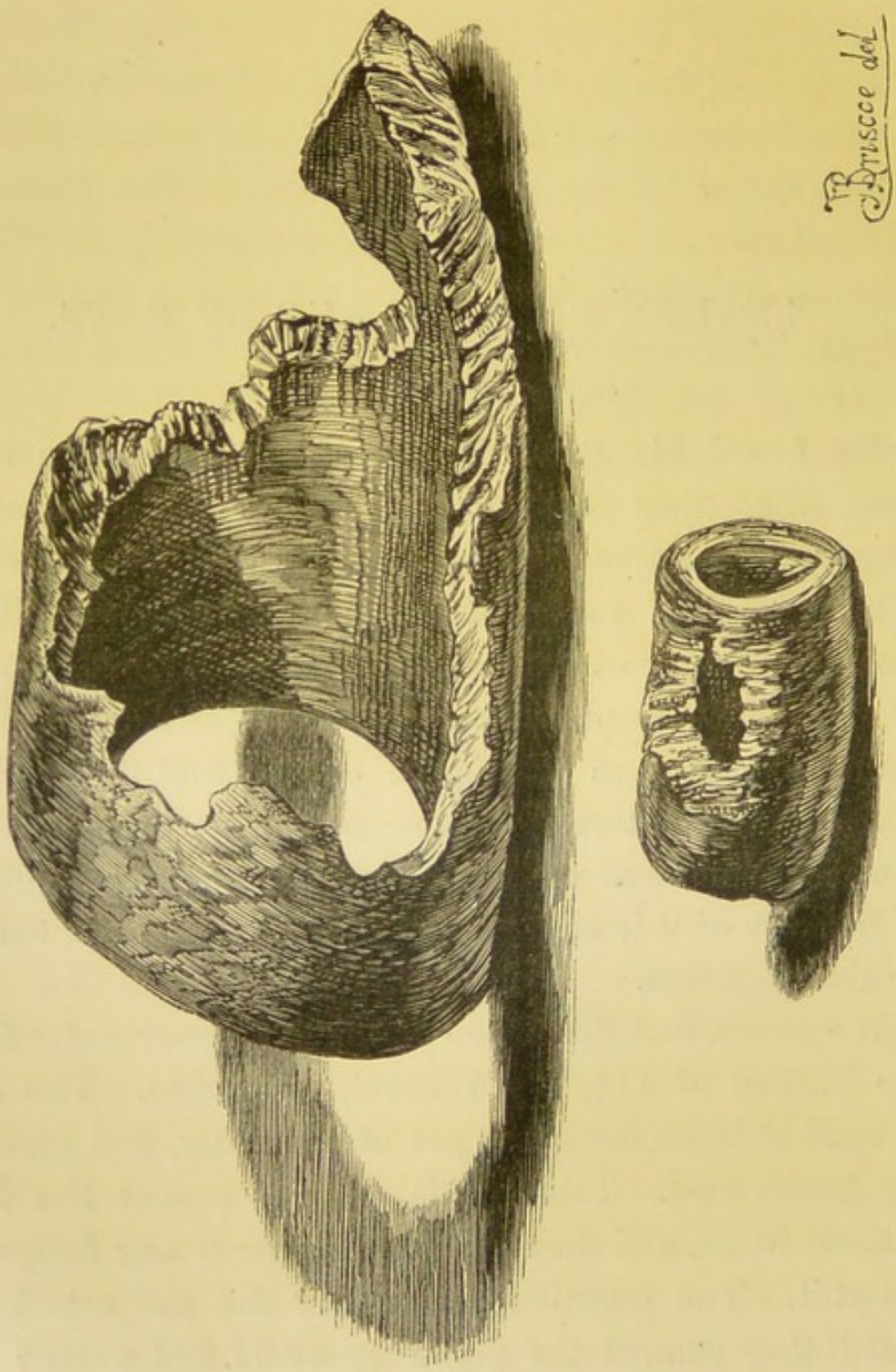
LEADEN PIPE GNAWED BY RATS.

My friend, Mr. P. M. Burgess, has kindly given me a most interesting piece of leaden pipe. It is six inches long, and two inches in diameter. It presents a wide gap four and a half inches long, and about two in width, running down nearly the whole of its extent. The edges of this gap present minute grooves close to each other. On examining them it is quite evident that they are the markings of the teeth of rats—minute particles of lead, the result of these gnawings, can be seen at the bottom of the pipe as it is laid down flat, which I assume was its original position.

It appears that this pipe carried the greasy water from the kitchen at 119, Wood Street, Cheapside. The rats gnawed at it, no doubt, to get at the water, and possibly the grease also. These little animals cannot live long without water, and they will brave almost any danger to get at it. The question arises, how did the rats know that if they gnawed the pipe they would find water? Is it that they heard the sound of it as it rushed through the leaden tube?

The engraving represents an exactly similar case of a

leaden pipe gnawed by rats, which I have had in my



LEADEN PIPE GNAWED BY RATS.

collection some time, and which was given me by Mr. George Pollock, surgeon to St. George's Hospital. The

pipe was laid down on the hospital premises. The markings of the rats' teeth in the lead can be plainly seen in the engraving.

Rats will also gnaw wine casks, and drink the wine. I have recorded a case of this in my "Curiosities of Natural History," first series.* It was reported that there was a ghost in the house—a gentleman's house near Axminster, Devon. Precautions were taken to fight the ghost, which turned out after all to be simply all the rats in the parish having a "free and easy," and getting screwed on some sweet home-made wine which had just been prepared by the lady of the house, and to get at which they had gnawed a great hole in the barrel.

Since the Exhibition of 1874 closed, and the refreshment rooms went away, the poor "Exhibition rats" have been very hard up for food, and they now come and try to eat my live fish, and steal my salmon eggs.

Mr. W. Frazer, M.R.I.A., Lic. Coll. Physicians, Dublin, suggests another explanation of the fact of lead pipes being gnawed by rats. He does not consider that these rodents cut across the pipes to get at the greasy water contained in them; and he sent me a drawing of a gas-pipe of lead similarly gnawed through, which he thinks points to a different conclusion. He says:—

"This gaspipe was eaten away about fifteen months ago in a large establishment in this city, and the consequent escape of gas was, as may be expected, so great as to produce much annoyance. It lay under the flooring of a room in the third story, and beneath was a large ware-room. The gentleman who used the upper room, finding

* Published by R. Bentley and Son, New Burlington Street.

the escape of gas offensive, went to try for its source with a lighted candle, and applied it to a mouse-hole in the skirting. The mixture of air and gas (which is well known to chemists to be far more explosive than pure coal gas) instantly blew up, hurling the flooring upwards, and the ceiling of the room underneath fell almost entirely, producing considerable damage. It was fortunate there was no one injured by its fall. It took place in the evening, when the persons who worked there were absent, but the incautious experimenter got a practical lesson on the danger of gas explosion he is never likely to forget.

"I would suggest that rats and mice, like rabbits, are fond of keeping their teeth at work, and a lead pipe cannot be much harder than any description of wood which these creatures work through. Rats will mine for considerable distances to reach water, and medical men well know the danger of rat-holes forming communications with sewers and receptacles of decaying matter, and the springs or pumps too often placed for mere convenience in contiguity with the ash-pit or manure-heap; but this is not a sufficient explanation for a rat trying its teeth on a gaspipe.

"By-the-bye, why attribute the mischief to rats exclusively? Could not our little gnawing friend the mouse make his way through lead pipe also? I have no proof of his felonious deeds in this direction, but the size of the teeth marks in the specimen now before me would lead me rather to attribute the destruction to mice than rats. I find that rats are well known in Dublin to eat across lead pipes. A gentleman residing in Grafton Street told me this day that rats had so often eaten

through the soft lead gaspipe in his house, that he found it best to replace the lead with copper tubing."

Mice are, no doubt, almost as destructive in this way as the larger animals, the rats. Not very long ago an old ship, used as a sort of sailors' home, reading-room, church, &c., in St. George's Dock, Liverpool, suddenly foundered in consequence of leaks made by the rats and mice on board. If the animals wanted to get to the water in this case, one would have thought they could have found an easier way by going overboard, instead of gnawing through the ship's side.

PUSS, THE BLIND MAN'S DOG.

About Christmas time, 1872, after several hours of hard work, writing my official report at my office, No. 4, Old Palace Yard, I found on turning out that the weather had become bitterly cold, blowing half a gale of wind, with sleet. Running along the not particularly-well-lighted pavement I nearly stumbled against a man standing at the corner of the street by St. Margaret's Church; luckily the glitter of metal on his cap caught my eye, and looking at this I saw that it was a brass plate with the word "Blind" engraved on it. The poor man was tapping his stick against the curb-stone, apparently wanting to cross over the street; so I waited quietly to see what would happen. He had with him a little dog tied to a string; the dog was in the roadway pulling at the string while his master kept tapping the edge of the pavement, and evidently intently listening for the sound of wheels. At last the man said "Go;" in an instant the little dog ran across the street, pulling, with open mouth and extruded tongue, at the string, like a greyhound in slips. I was pleased to see that the pair of them arrived quite safe at the other side. I at once entered into conversation with the blind man, and, wishing to obtain his history, I told him to call

the next evening at my office as he went to his usual stand.

I now give the story of this poor man as he told it me: —"My name is James Stocks. I am twenty-eight years of age; and I live at No. 1, Laundry Yard, Westminster. I have been blind with both eyes [the poor fellow is also otherwise terribly disfigured] three years next April. I lost the left eye first with a blight [he must have had ulceration of the cornea, as the eyeball was nearly empty], and shortly afterwards a cataract came in the right eye. I cannot see light from darkness. The middle of the night is just the same to me as the middle of the day, and the middle of the day the same as the middle of the night. I used to get work sweeping mud in the streets for Mr. Ferguson. My sight went very gradually, and latterly I worked in great fear, as I could not afford to leave off. At last I was knocked down by a hansom cab, and one day, at the top of Rochester Row, a break with two horses came along, and I was struck down by the pole, and somehow I got in between the two horses, which began to jump about fearful. I was so much hurt that I was frightened to work in the streets any more. The accident was no fault of the young man as drove the horses."

"Well my man," said I, "how long have you had your little dog?"

"Well, sir," he said, "my dog is as good to me as a pair of eyes. I calls her 'Puss.' She is two years and a-half old, and I gave two shillings for her off a stranger. A blind man told the stranger to bring her to me, as he knew I wanted a 'guide-dog.' I had to train her myself. I took her to the safest place I knew, that is by the side

of a long blank wall. At first she would only get lagging behind me, but I took her out for half an hour every day, and in two or three weeks she learnt to lead me quite well. It took me longer to trust to the dog than it did for the dog to learn to lead me along, and now I can go anywhere with her. She knows her way as well as I do, and I have never been run over since I have had my Puss. I feeds her on cat's-meat, and I gives her an extra half-pennyworth whenever I can afford it. I cannot afford anything better than cat's-meat for her, but she will eat cakes, sweetstuff, apples, pears, and almost anything that the children give her in the streets. She will also eat any sort of pudding, and she has had several pieces of plum-pudding given to her this Christmas time.

"I comes out with her every morning from twelve to three, and at night from six to ten, and I stands on the other side of Westminster Bridge by St. Thomas's Hospital, selling cigar-lights, and sometimes the people gives me a few halfpence. It's mostly the poorer sort as gives me. I don't often get a bit of silver. I am obliged to go out in all weathers, or I should have nothing to eat; whether it's blowing, wet, or cold, I has to go. When it's very cold I carries a little chair in a bag at my back, for Puss to set down upon to keep her off the damp cold stones. I also ties a little bit of carpet on her in cold weather, as I feels more for my little dog than I do for myself as she sits there a-shiverin'. I always carries a little water for her in a bottle in my pocket. I gives it her in a penny tin mug, and, Lor' bless you, the little dog knows her bottle and tin mug when I pulls 'em out of my pocket as well as 'sighted people' do a cup and saucer.

[It appears that blind people call those who, happily, are not so afflicted, "sighted" people.] As I stands at my post by St. Thomas's Hospital, Puss sits by the side of me as quiet as possible. When she sees anybody a-looking at me she stands up on her two hind legs, wags her tail, and asks for something for me. I think she knows them again as have ever spoken to me once. I can't keep her down; just you try her now, sir, and see if she will do it;" so I rose from my seat, and went towards the poor blind man. In an instant, Puss, who had been curled up at her master's feet, was upon her hind legs begging for him, while every now and then she gave a sharp yap, as much as to say, "Do give us something; we are both very poor."

Puss is a very ordinary-looking, half-bred little Scotch terrier. She is white, with liver-coloured spots. Her master keeps her very clean. She has a long bushy tail, which she keeps incessantly wagging, and when engaged in her daily occupation of begging, wriggles and jumps about with that peculiar pleased manner which is the language of dogs when they wish to be noticed. The face of this little Puss is perfectly beautiful. Her eyes are jet black, and an almost human intelligence beams from them. She has long fox-like ears, which, at the least sound or motion, assume an attitude of intelligent listening. Would that some painter would take the portrait in oil of this humble but intelligent and useful little blind man's "guide dog."

"There is one thing," the poor blind man continued, "that as you are a real gentleman, I should like to call your attention to—it's the dog-tax. I has to pay five shillings a year for my Puss. I've got to pay it, for if they

takes my dog away it would be as good as taking my sight away again. Last year a gentleman gave me five shillings to pay the amount of the licence. I got one last year, but I am sorry to say it expired on Sunday last, and now I shall have to begin to save to get a licence for this year; I likes to make it safe, as I have heard I might get locked up if I had not got one." Surely this is a case which should be brought before the attention of the Government, as I feel sure the Legislature never intended that the tax should apply to the dogs of poor blind men. I wish some M.P. would be good enough to take up the question.

The man then continued. "The parish allows me a shilling a week and two loaves of bread; when I goes for my money I can't take my dog, and I feels the miss of her very much. The other night I had an accident, at the end of Tufton Street, for I hit my head against the tail of a furniture van that was projecting across the street; there was nobody to mind the van and nobody to stop me running against it. When I am without my dog I has to go tapping along the edge of the curb with my stick to find out the lamp posteses. I sometimes knocks my head very hard against them lamp posteses if I have not got my Puss. But them pillar posteses for letters is very bad for blind men; there is no telling where they are, and they seems to come up suddenly anywheres in the streets. They sticks 'em up about a foot and a half inside the curb. When the blind man goes along he keeps feeling the curb with his stick, but the pillar posteses is just in the line of the blind man's walk, and just measures him in the face when he knocks up against it. Lamp posteses is bad enough, but them pillar posteses is

wuss, but when I has my dog I goes along quite safe like.

"The other day a blind man fell down through an open cellar-flap of a public-house. Puss saved me once from a cellar-flap; she ran me in amongst the barrels—that was at the 'Jolly Millers,' in Westminster. Cellar-flaps is regular traps for blind men. I always comes up the same road every night, along Church Street, Wood Street, College Street, and then I passes your door, sir, No. 4, Old Palace Yard; my dog is sure to stop there now as she has once been in; then I stops by the corner at St. Margaret's Church where you first saw me. It's not a very difficult crossing to Westminster Hall, but it's very bad to get across them two roads, which the cabs uses, as they come out and in to the New Palace Yard. Them two gateways is most dangerous; the cabs keep a coming in and going out, and don't mind where they are a-running. Puss always goes over them very quick, but when the Houses of Parliament are sitting, I am obliged to ask somebody to take me over, as then I cannot altogether trust to the dog, there are so many carriages about. One day when I was crossing, a cab came up suddenly, and Puss jumps behind me and barks as much as to say there was danger, and to tell me to stop. I believe she saved my life that time.

"She once saved me from being hurt by a perambulator. I heard it a-coming smart along the pavement in a narrow street, but I could not get out of the way though I taps loud with my stick; what does Puss do but she runs me right out on to the road, and comes round again right behind the perambulator? If anybody had told me a dog would have done this, I could not have believed them, but

I knows it for a fact. I don't know who was with the perambulator. I trusts much to the brass plate on my cap. It says '*BLIND*,' don't it, sir; but my little dog takes me along as well, and as safe, as I could see to go if I had got my eyesight.

"The only fault Puss has is cats. She won't pass a cat. If she sees a cat sitting up again the railings she stops directly, and then runs me right up to the cat, and I must go where she takes me. One day a cat flew out at her, and scratched her nose. I was afraid she might hurt my dog's eyes, and I had a hard job to drive that 'ere cat away. It's no use, Puss won't pass a cat if she sees one in the street or sitting on the area-railings. She gets on very well with the kitten at home. The two of 'em sleeps together in a half-bushel basket. The kitten often takes a bit of meat out of the dog's mouth. I always knows when the kitten robs the dog and has got the meat, as she growls awful, but if Puss is hungry she will defend her food then.

"I goes to a blind man's club once a week in Westminster. There are some forty or fifty blind men and women there. We all sits down and a 'sighted man' reads out loud to us. I never takes the dog there. They gives each man and woman threepence for somebody to bring them there. That is what we calls guide-money."

I trust my readers will be interested with this little history of the poor blind man and his dog Puss. Should any person who reads the above feel inclined to send him a trifle towards paying the tax for poor little Puss, and giving her an extra bit of meat, as well as buying the poor man some warm clothes and new shoes, I shall gladly pass it

on to him, and I shall not regret that I happened to meet with this poor blind wanderer and his faithful little dog in the streets of our vast metropolis on a cold Christmas evening.

The above article was copied into several papers, and in a few weeks I received subscriptions, amounting to upwards of £40, for Puss and her master. The list of subscribers can be found in the "Animal World," * and a very good drawing of the Blind Man and his Dog, from the pencil of Mr. Briscoe, appeared in No. 33 of that paper. The subscribers represented kind-hearted people of all classes, from Noblemen and Noble Ladies who sent their sovereigns, to servants who sent their sixpences, and school-children who sent their single penny Queen's heads. This tells well for the vast amount of true humanity that exists among English people. I am happy to say that the blind man has been much bettered in circumstances through the subscription, and he—and so would "Puss," if she could speak—desires me to return his most sincere thanks to those who have been so kind to him and his dog. They are both (Jan., 1875,) at their post on the Surrey side of Westminster Bridge.

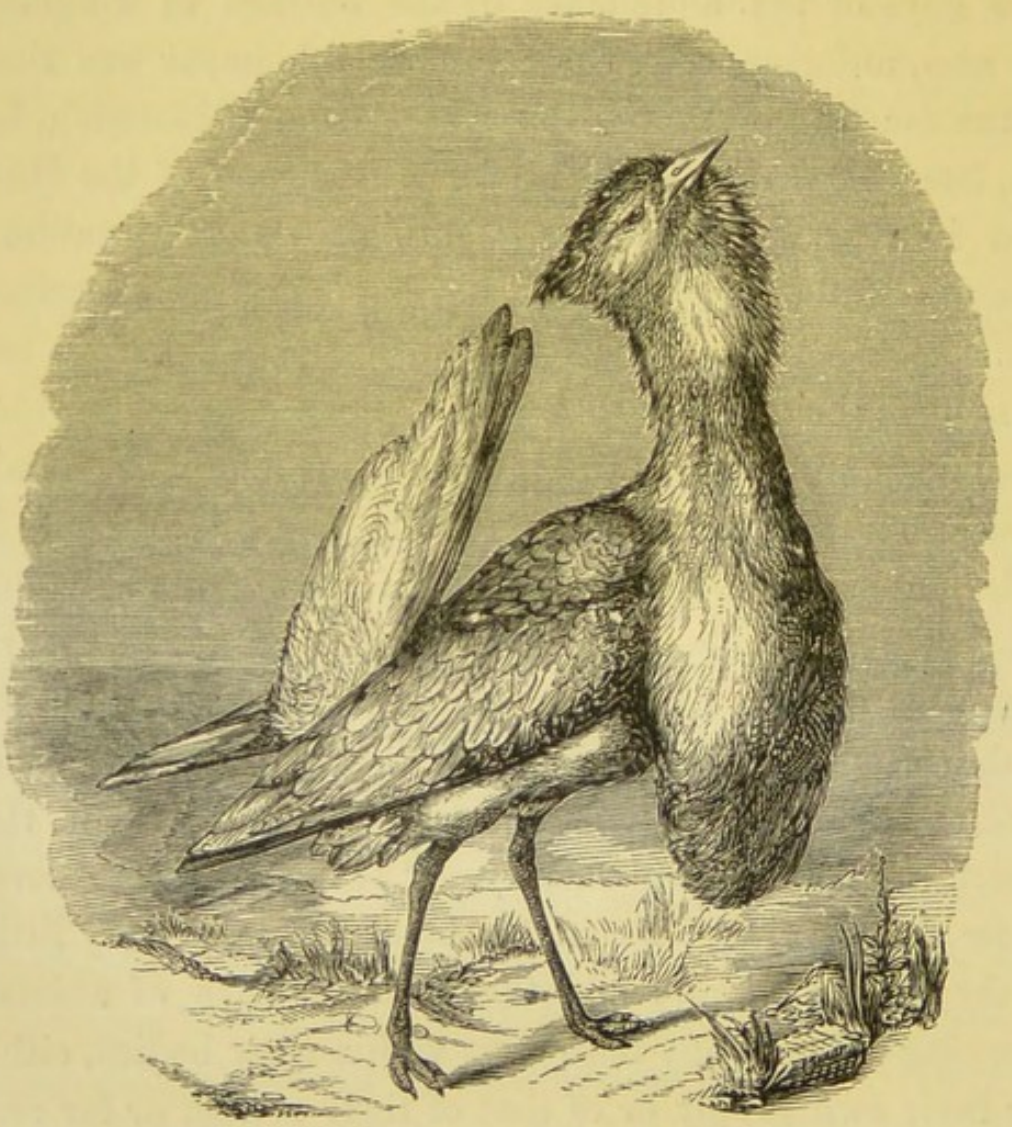
* Published by the Royal Society for the Prevention of Cruelty to Animals, 105, Jermyn Street, St. James's, London.

USE OF THE GULAR POUCH OF THE BUSTARD.

By the kindness of Dr. Murie, I am enabled to publish a portrait of the bustard in the act of inflating his pouch. Dr. Murie has lately published the results of his observations on this subject in the Proceedings of the Zoological Society. The opening by means of which this pouch is inflated is thus described:—"On looking into the mouth of the bird, while the tongue lies between the rami of the lower mandible, no opening into the gular pouch is seen; but when the tongue is raised and the parts held as in the act of gaping, an aperture easily admitting one's finger is observed. This is situated beneath, and almost an inch behind, the tongue itself; in fact, it lies underneath the upper larynx, occupying the space between it and the submandibular deep and cutaneous tissues. The gular pouch, in fact, appears to me but an unfolding of the membrane below the upper larynx, developed to a large size in male bustards only after they attain ripe or old age. This view, therefore, accounts for its absence in the young, its moderate size in adults, and its increased capaciousness in old birds." In Martin's "New Dictionary of Natural History," 1785, the following details

relative to the bustard are given:—"These birds are frequently seen in flocks of more than fifty on the extensive Downs of Salisbury Plain, on Newmarket and Royston Heaths, in Cambridgeshire, on the Dorset Uplands, and even as far north as March or Lothian in Scotland." The days of the abundance of the bustard in England are now, unfortunately, past; and an able paper was read at the meeting of the British Association at Norwich, by Mr. Stevenson, on the "Former Abundance of the Bustard in England and the Cause of its Extirpation." The use of the pouch of the bustard was thus described A.D. 1785:—"As a security against drought, nature has furnished the males with a pouch, the entrance of which lies immediately under the tongue, and which will contain near seven quarts of water, and this they fill probably in order either to supply the hen when sitting, or the young till they are capable of flying." As the science of natural history advanced, this idea was questioned. In 1836, the author of the article on bustards in the "British Cyclopædia" states that the conjectures of the use of this pouch are far from satisfactory. "It has been considered to be a reservoir for water, but bustards drink very little, if they drink at all; and the usual stories of animals carrying water in any reservoirs within their bodies, either for their own supply or of that of their young, or for anything else, have no better foundation than the now-exploded error, that water for the supply of travellers in the desert can be had from the reticulated portion of the compound stomach of the camel. The female bustard wants this pouch, as also the pendant feathers and the violet-coloured naked skin on the sides of the neck."

Under the above circumstances, therefore, it is very interesting to know the decision which the late learned prosector to the Zoological Society has arrived at relative to the true anatomy and use of this peculiar organ. In the Proceedings of the Zoological Society, June 25th,



BUSTARD WITH POUCH EXTENDED.

1868, Dr. Murie comes to the following conclusions:— "1st. There is nothing in the structure of the gular pouch, in its position, or in the habits of bustards, which justifies a belief that its use is that of a water reservoir. 2nd. Its nature, etc., equally affords grounds for consider-

ing that it is not a residual sac for food; the fact of a trifling quantity of seeds, grass, or leaves being found in it appears to me only an accidental circumstance, the absence of great muscularity in the walls permitting the foreign body temporarily to lie there. 3rd. What has been observed in the Australian bustard in our gardens shows that the pouch is a feature connected with the reproductive function, *and only a temporary air chamber.* 4th. That the gular pouch is an organ of adult growth, possessed only by the male, and not attaining its full dimensions until the bird has arrived at maturity; to such circumstances the incidental and non-development of the organ may be ascribed." The Pouter pigeon has a somewhat analogous apparatus. I am pleased to find that my ideas had been anticipated by Dr. Murie, who says, as an argument for the pouch being simply connected with the breeding season: "The gaudy peacock swells out with tremulous emotion, the turkey cock, the tragopan, and other birds erect their wattles." To this list I may add the case of the ruffed grouse (*Tetrao umbellus*), which is provided with two air pouches, by means of which it erects the ornamental feathers of the upper portion of the breast. By taking the beak of this bird in one's mouth and blowing, I find that these air chambers can be inflated; the same can be done with a Pouter pigeon. In order to make his observations on this curious subject complete, Dr. Murie should put up preparations of the pouches of the Pouter pigeon and of the ruffed grouse by the side of that of the bustard.

The illustration represents the bustard with his pouch inflated, or, as the keeper calls it, "showing off." This

occurs in the month of May, and continues into June. "The neck swells, and the feathers of the lower part descend gradually downwards in the form of a bag, oftentimes nearly reaching the ground. The tail is shot upwards and forwards over the back, coming almost in contact with the neck; in this attitude the bird struts about in a somewhat waddling manner, the elongated pouch swaying to and fro. The display occurs chiefly in the morning or at sundown." The above observations I think, therefore, are conclusive as to the use of the remarkable balloon-like bag under the skin of the neck of *Otis tarda*.

DINNER OF AMERICAN GAME AT THE LANGHAM HOTEL.

On Tuesday, February 7th, 1871, I had the great privilege of being invited by Mr. Morton C. Fisher, of New York, to an "American dinner" at the Langham Hotel. A large number of distinguished American gentlemen were present.

The dinner consisted almost entirely of American dainties, sent over from the other side of the Atlantic expressly for this occasion. Upon entering the magnificent banqueting room we found oysters upon the plates; these were the American oysters I have so often described; they can always be easily recognised by the peculiar black marking on the inner side of the shell, just at the points where the ligament which holds the two shells together is attached. Some English oysters were served at the same time: the American oysters had a decidedly different taste to the English, but they were by no means unpalatable, having somewhat the taste of a very good periwinkle. I was fortunate enough to sit next to a gentleman (Mr. C. G. Leland) who gave me much information about the various dishes put before us. He tells me that the black markings, or "Wampum-spots"

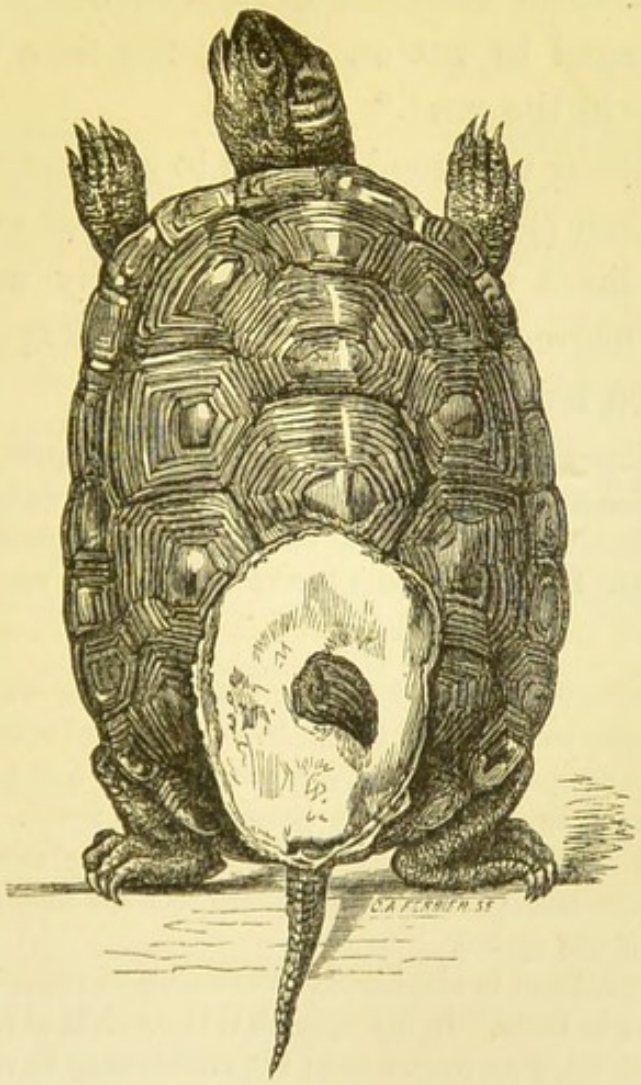
in the American oyster-shell were formerly cut out, made into beads, and used as money or ornaments by the Indians. These beads were still manufactured, not many years ago, on the Hudson river, by white men, and sent to the north-western coast, where they are even now used by a few remote tribes.

Oysters are exceedingly plentiful in America,* and are mostly served at table in a cooked state. They are in some cases so large, that it is said to be impossible to eat them in any other way. We had some oysters rolled into little round balls—fried and covered in bread-crumbs; they were very delicious. I should certainly advise those who are fond of oysters to try this plan with the English oyster.

The soups consisted of tomato soup, served with dry sherry, and Terrapin soup, served with milk punch. The terrapin (*Malaclemys concentrica*) is a little blackish water-tortoise, and varies from three to six inches in length. Mr. Holbrook, as quoted by the Rev. J. C. Wood, writes as follows:—"The terrapins are very abundant in the salt marshes around Charleston, and are easily taken when the female is about to deposit her eggs in the spring and early summer months. They are then brought in immense numbers to market; but they are so prolific that notwithstanding this great destruction, their numbers appear undiminished. Their flesh is excellent at all times, but in the northern cities it is most esteemed when the animal has been dug out of the mud in its state of hybernation."

* I have a fine collection at South Kensington, in my Fish Museum, of almost every kind of American Oyster—only the shells, of course.

By the kindness of Prof. Spencer T. Baird, (Smithsonian Institute), Washington, U.S.A., I am enabled to give a figure of one of the most remarkable adhesions of oysters that ever came under my notice. As will be observed,



TERRAPIN WITH OYSTER SHELL ATTACHED.

the oyster has attached itself firmly to the shell of a living terrapin, such as we had for dinner.

It will be seen from the engraving that the oyster has taken up its position immediately above the tail. When the oyster first attached itself, in an early stage of growth, the terrapin was probably not much troubled by

it, but as the oyster became larger it doubtless became a great nuisance to the unfortunate creature on which it rode, particularly as the latter was unable to scratch it off. Oysters do not certainly hybernate; terrapins do hybernate; it therefore becomes a curious question how the oyster managed to get on during the time the tortoise buried itself in the mud.*

My neighbour was good enough to give me some verses, from American popular songs, about almost every dish on the table; these rhymes were principally made by the Cuffies, or negroes. The following is a specimen of a negro ode on terrapins:—

> Ebery morning early, massa give me liquor,
> Take the paddle wid me, and I pull out quicker,
> Den we take the skiff an' row de ribber driff,
> An' I cotch as many terrapin as we two niggers liff.

---

* None of us have yet found out the exact mode by which an oyster is enabled to anchor itself. One thing, however, is quite certain, that the shell of the young oyster, when in a growing state, will take an accurate cast of the object to which it has chosen to fix itself. If this oyster were detached it would probably be found that the mouldings of the horny case of the terrapin were reproduced line for line on the mineral-formed shell of the oyster.

The above specimen is also highly interesting as regards the scientific theory of oyster culture. In my opinion it is possible to have everything in perfect order upon an oyster bed; the cultch may be clean, and there may be an abundance of parent oysters; but if the natural conditions for the well-being of the young spat are not present, no young oysters will be found to adhere to the cultch, and in proportion as the conditions are favourable or not, so the numbers of young oysters *fixed* will be larger or smaller. The localities where these terrapins are found are quiet creeks, etc.; and where could we have better conditions for the existence of "heat and tranquillity" than in these creeks? A young oyster swimming about in one of these creeks in search of a habitation could not do better than to "sit down" upon the clean polished shell of a terrapin, and there fix itself for life.

This terrapin soup is exceedingly good, and I wonder it is not introduced into England in hermetically sealed tins, as lobsters and salmon are sent over. Its taste is not unlike a good turtle soup. Terrapins might be made to breed in English greenhouses, &c.

The *entrées* consisted of

Tournedos of buffalo, sauce Italienne;
Quail, broiled à la maître d'hôtel;
Salmi of Prairie hen, with truffles.

These were served with Champagne and Bordeaux. The buffalo was exceedingly tender, more so than any rump-steak I ever tasted. Buffalo tongue and hump are also very good. My neighbour had been in the buffalo country, in Kansas, and he told me many anecdotes of buffalo-hunting. A new fact he told me is, that when buffalo are on the run they appear to have an undulating "pitching and heaving" motion. Among buffaloes proper, are the African buffalo (*Bubalus buffelus*)—and the Cape buffalo (*Bubalus caffer*), whereas the American buffalo is a bison (*Bison Americanus.*) There is a very fine specimen of this animal, stuffed, in the Liverpool Museum; it is a well-known animal, whose capture was so well described, some years since, by the Honourable Grantley Berkeley. There is, I believe, a story of this animal, that those who skinned it on the prairie cut off the legs at the knee-joints; the stuffed specimen therefore stands not upon his own legs, which were left in the prairie, but on cow's legs.

I have in my scrap book a most amusing drawing of a buffalo taking off his skin just as a man takes off his coat. The skin is coming off at the neck; the head remains intact. A sportsman in the distance is coming

up with the gun; the buffalo says, "Don't shoot; take my robe, and let me go in peace."

In January when the wolfing season has commenced on the prairies, the hunter impregnates the carcase of a buffalo or other animal with strychnine and places it in a likely position. As many as fifty wolves are occasionally found dead around the carcase on the following morning.

The quail served at dinner I suppose to be the *Ortyx Virginiana*. The flesh was exceedingly good, and very white: its feet were unfortunately cut off by the cook. The "prairie-hen"—viz., the *Pinnated grouse* (*Tetrao cupido*)—was exceedingly good. These birds often appear in numbers in the London poulterers' shops.*

The haunches consisted of

Haunch of elk, with apple sauce;
Wild turkey, with cranberry sauce;
Sweet potatoes and Lima beans.

As usual the dispute as to what was an "elk" turned

* A correspondent in "Land and Water," writes:—"With the close of January the close season in America for nearly all the upland game ceases. Water fowl continue in till the spring. In Florida, deer, woodcock, quail, turkeys, and snipe may be shot until March, and in Canada female moose and caribou are in season till February. In the Eastern States woodcocks and hares are the only game left for shooting until another season. At a friendly match between some sportsmen of Oxford, New York, the following bag was made: one fox, two racoons, two woodchucks, eight rabbits, seventeen skunks, 338 black and grey squirrels, 206 red squirrels, 3,420 chipmucks, four hawks, ten owls, thirty-five crows, 244 partridges, seventeen pigeons, eight woodcocks, two wild-ducks, and one crane. One gun in a week's trip in the wilds of Canada bagged eleven deer. Three guns from Bismark, banks of Missouri, killed 246 pinnated grouse in three hours. All kinds of game are plentiful in this district; for hundreds of miles on either side of the river there are very few trees; in cold weather the grouse congregate on these, and can be shot in large numbers.

up. The animal that we English know as an elk is the moose (*Alces malchis*), whose natural history has been exhausted by my friend Captain Hardy. An excellent picture of two elks, the property his Royal Highness the Prince of Wales, has appeared in *Land and Water* (Aug. 15, 1868, No. 134). The animal called "Elk" by an American is that magnificent stag, the "Wapiti," or Carolina stag (*Cervus canadensis*). This is the animal I am so anxious to get introduced into Scotland, to increase the size, weight, and head of the native deer.

The wild turkey was exceedingly good—more tender than the English turkey. I had never tasted cranberry sauce before; it has a nice sharp semi-acid about it, which goes exceedingly well with turkey, and would probably be found a great adjunct to roast pheasant. Cranberries are to be had at the general shops in London during the winter. They are principally used, I believe, for making tarts. The "sweet potatoes" were literally what their name professes. In taste they were very like *Diascorea batatas*, which the Acclimatization Society tried to introduce into this country. Our efforts, however, failed, as the roots persisted in growing straight down to such a depth in the ground that it was next to impossible to dig them up. My neighbour gave me the following verses, composed by one Grumbo Cuff, in which the sweet potato and the turkey are rendered immortal:—

A grasshopper sat on a sweet-potato vine,
Sweet-potato vine,
Sweet-potato vine;
A big wild turkey came running up behind,

And *yanked* the poor grasshopper
Off the sweet-potato vine,
The sweet-potato vine.

"Yanked" is a good word, which I think we ought to introduce into this country.

At this stage of the dinner an interval took place, and to my intense delight the waiter came round with cigarettes of the most perfect tobacco I ever smoked. If cigarettes were introduced at an early period of English public dinners, I feel certain that the host would keep his guests together much longer than at present, and that the speeches would be much more eloquent. Medically speaking, I feel convinced that there is no greater adjunct to digestion, and no greater prompter of good fellowship, than a whiff of tobacco. The cigarette being thrown away, we began again with:—

Roast canvas-back duck;
Roast partridge,
Served with Chamberton and Chateau Cos.

I had often heard that the canvas-back ducks are the finest food that can be placed upon the table; having now tasted them, I feel convinced that a better dish does not exist. This duck is allied to the English pochard duck; its name is *Fuligula Valesneria*. I am told these ducks derive their name from the appearance of the skin of the back after the feathers are taken off, which very much resembles the canvas used by ladies for their Berlin-wool work. These canvas-back ducks are said to derive their flavour from feeding on wild celery, to obtain which they dive to a considerable depth. I do not know what wild

celery is: I should much like to have some seeds. A duck called the red-headed duck lives with the canvas-back, and its flesh is almost as good. The following verses are sung by the niggers about the canvas-back :—

Down de Susquehanna me and bully Jock,
Dar we git the reed-bird, and slay de canvas-back.

Once, upon a drift log, tink I see an alligator,
Scull my boat around and chuck him sweet potato :
I hit him on de head and try for to wix it,
Couldn't fool him bad, couldn't nohow fix it ;
Den I up wid a brick, and hit him such a lick,
And 'twas nuffin but a pine log upon a big stick,

EXPERIENCES OF A WHITSTABLE DIVER.

In July, 1871, I had the pleasure of an interview with Mr. W. Wood, of Herne Bay, who, after having followed the business of a diver for upwards of twenty-two years, has retired after a long and active service. The stories Mr. Wood told me were so interesting that I obtained his permission to publish them.

Mr. Wood made his first real start in life by an extraordinary, and as it turned out, a very lucky, piece of diving. If the reader will look at the map of Ireland, he will see that outside Belfast Lough, and a little to the south-west, opposite Donaghadee, are situated the Copeland Islands. It so happened that a Whitstable man was a coastguardsman in this district. He heard a legend that a ship laden with a heavy cargo of silver had been wrecked off the Copeland Islands some half a century ago. He, therefore, communicated with some of his friends at Whitstable who were divers. Accordingly, Mr. Wood and four others put their diving-dresses on board a vessel, and sailed from Whitstable to Donaghadee.

The story they heard when they got to their destina-

tion was, that the wrecked vessel was in the slave trade, and that she had on board a large number of slaves when she struck on the rocks, and also a considerable sum of money in the form of silver dollars. Nothing would have been known of the wreck having taken place, had not somebody discovered human legs projecting above the surface of the water. It appears that the people on board the ship had tried to escape, having first filled their shirt-sleeves with dollars; but in getting up the rocks many of them had fallen back and met with an untimely end, as the weight of the dollars had kept their heads under water. No one had ever disturbed the wreck since the vessel went down, so Mr. Wood and his friends set to work to find out where she was.

They put on their diving-dresses, and for two or three days walked about to and fro at the bottom of the sea in about forty feet of water searching for the treasure. This they did by clearing away the weeds and turning over the stones with crowbars, and feeling for the dollars with their hands, as the water was too thick to see. The wood part of the wreck itself had entirely perished through lapse of time and the ravages of sea-worms. After a long and careful search at last they came upon the dollars; they were mostly spread about among the stones, but many had slipped down among a heap of iron ore which had formed the ballast of the ship. Many of the dollars were worn thin by the action of the water. Some were lying separate, others in great lumps, like rocks, soldered together by iron. In some cases certainly this iron had once been handcuffs used for the slaves. Some days the divers got two hundred dollars, sometimes three hundred,

sometimes a thousand; the best day they got five thousand, *i.e.*, £1,000. In all, the number of dollars they got up from the wreck was about twenty-five thousand, which, when reduced to English pounds, equals five thousand pounds.

When the dollars were in the sand they took down sieves and wooden corn shovels, and riddled them out at the bottom of the sea.

Mr. Wood showed me one of the dollars, which he always carries about with him. The following is the inscription:—On one side, "Carolus iiij. Dei Gratia. 1797. Hispan et Ind Rex M 8 R. FM." The coin is about the size of an old five-shilling piece. The "Divers' Arms," near the clock-tower at Herne Bay, of which Mr. Wood is proprietor, owes its existence to the discovery of these dollars.

When hunting among the wreck for the dollars, Mr. Wood had some curious under-water adventures. One of the divers complained that he was annoyed by a lobster, and couldn't work. Mr. Wood learned the whereabouts of the lobster, and went down after him. He soon discovered Mr. Lobster sitting under a rock, looking as savage as a lobster can look. His feelers were pointed well forward, and he held out his two great claws wide open in a threatening attitude. Wood, knowing the habits of lobsters, offered this fellow his crowbar, which he immediately nipped with his claws. Then, watching his opportunity, he passed his signal-line over the lobster's tail, made it fast, and signalled to the men above to "haul away." This they did, and instantly away went Mr. Lobster flying up through the water into the air

above, with his claws still expanded, and as scared as a lobster could be.

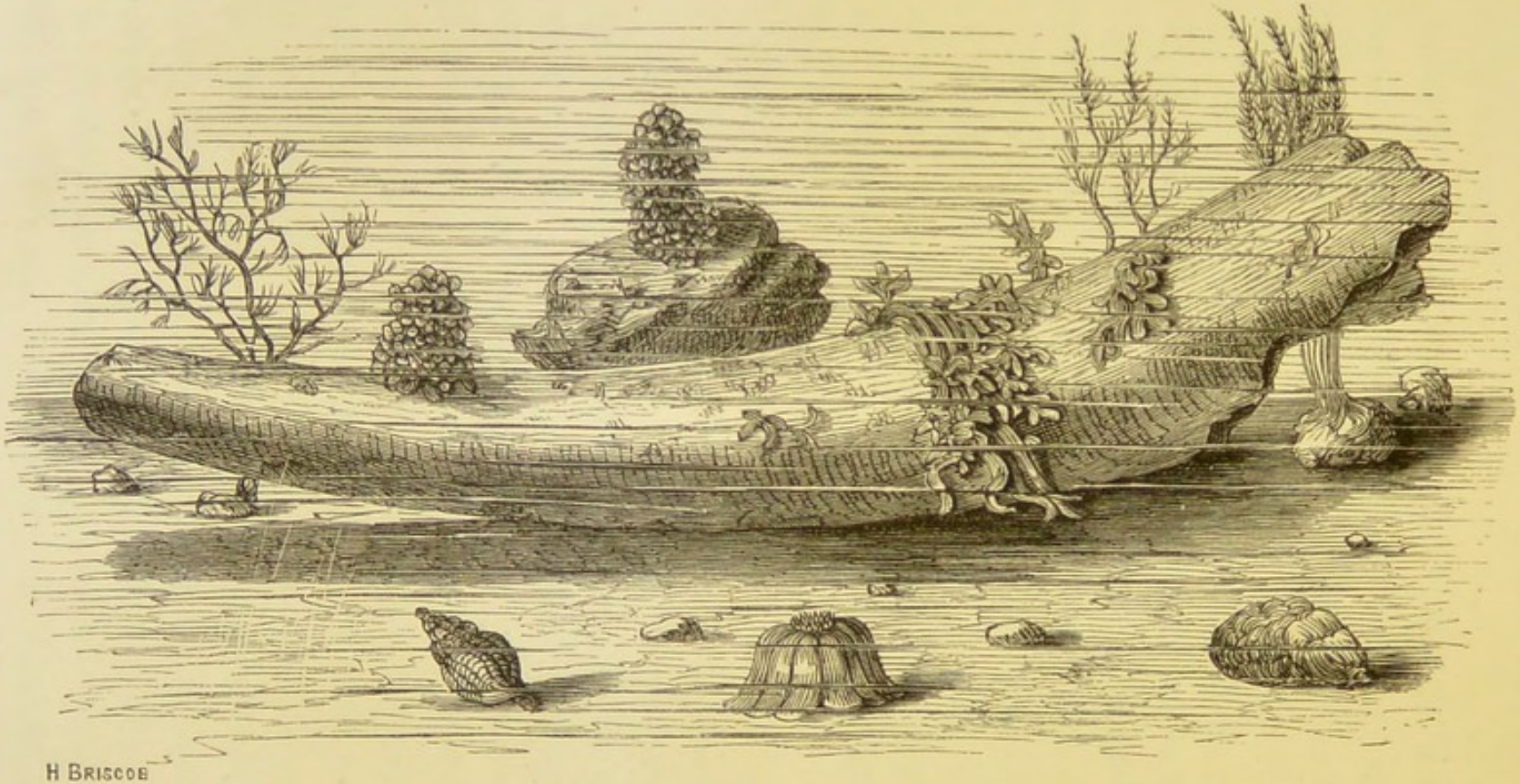
A great conger-eel also paid the divers a visit. He was an immense fellow, and kept swimming round Wood, but would not come near him. Wood was afraid of his hand being bitten, as a conger's bite is very bad. He once knew a diver whose finger was seized by a conger. The brute took all the flesh clean off the man's finger. A conger is a very dangerous animal to a man when diving in the water. However, this conger kept swimming round about Wood, so he took his clasp knife out and tried to stab him, but the conger would not come near enough to be "knifed." It was a long while before the conger would go away, and even after he had gone away Wood could not go on working because he was not sure that the brute was really gone for good, and he might have come out of some corner at any minute and nipped his fingers.

Mr. Wood has had other adventures with fish when working under water. He was once employed in fixing some heavy stones in the harbour at Dover; while waiting for the stones to come down from the ship above, he sat down on a rock, and being quite quiet, a shoal of whiting-pout came up to examine the strange visitor to their sub-aqueous residence; they played all about him, and kept on biting at the thick glass which formed the eyes of his diving helmet; so next time Wood went down, he took with him a fish-hook fastened to the end of a short stick—a gaff, in fact. The pouts came round him as usual, and he gaffed them one after another with his hook. He then strung them on a string, and came up

after his day's work was over with a goodly fry of whiting pouts for his supper.

On another occasion Wood was employed to bring up some pigs of lead from the hold of a vessel. When he was walking about on the top of the lead, he felt something alive under his feet. It kicked tremendously, but he knelt down upon it to keep it steady; he soon ascertained that it was an enormous skate that he was standing on, so he served him as he did the lobster. He watched his opportunity and slipped the noose of his line round the skate's tail; he then signalled to "haul away," and up went Master Skate, flapping his great wings like a wounded eagle; and mightily astonished were the people in the boat when they found a monster skate on the end of the line, and not a pig of lead.

Wood once nearly lost his life when at the bottom of the sea. A Prussian vessel had gone down off the Mouse Buoy in the Thames estuary. The captain was drowned in his cabin, and Wood had undertaken to get him out if he possibly could. Arriving at the bottom of the sea, he found the vessel lying over on her side, and that she had gone down with all her sails set. He tried to get into the cabin, but found the mainsail blocking the cabin door. He was just about to return when he found that his air-pipe and signal line had suddenly got jammed. Fully aware of his very dangerous position, and without losing his presence of mind, he sat quietly on the edge of the vessel and considered. The men above, he could find, were signalling violently to him to come up, but he could not answer, as the line was jammed. He took out his pocket-knife, and thought two



FOSSIL ELEPHANT'S TUSK FROM OYSTER BED.

[*To face page* 137.

or three times of cutting himself adrift. As a last chance, he determined to adopt another course, and climbed up the rigging, among the great wet sails and loose ropes, as well as he could, and fortunately found the place where his air-pipe was hitched. He carefully loosened it, gave the signal, and was hauled up immediately. If I understand aright, the line was clear enough when he went down, but while he was at work on the sunken ship, the tide changed, and his pipe and line, being carried in the opposite direction to that in which they had been originally conducted, became jammed. He did not get to the surface one instant too soon, for the boat was just drifting, as her anchors would not hold.

Wood told me he once found a "Sea Snake" drifted ashore near his public-house at Herne Bay. A showman declared it was a Boa-constrictor, but a very big one. The snake had probably died in some ship "from foreign" coming up the Channel, and had been thrown overboard.

Wood, also, one day came across a live tame goose swimming all by himself off the Pan Sands, a considerable distance out at sea from Herne Bay; he caught the old goose, and he and his wife cooked it for dinner. This goose had also probably escaped overboard from some ship.

At a very low tide at Herne Bay, Mr. Wood discovered a fossil elephant's tusk, nearly perfect, sticking out of the mud. He had not time to take it all out before the tide came up; but still he got a large piece of it. This curious fossil ivory is now in my museum at South Kensington.

I am sorry to say that since the above was written, poor Mr. Wood has died. He suffered terribly for many years with rheumatism, the result of spending so much of his time under water. Peace to the memory of this brave, kind-hearted old Whitstable diver.

FIGHT BETWEEN A SCORPION AND A MOUSE.

In Feb., 1869, I received by post a small box. On account of the holes pricked in the cover, and my previous experience with queer looking parcels, I suspected it might contain something alive, and therefore refrained from opening it until I had read my letters. It was fortunate I did so, for from one of the letters I learnt that the box contained two live scorpions, a present from my friend J. K. Lord,* who had caught them under a stone at Heliopolis, in Egypt, and sent them off at once by post from Egypt.

On carefully opening the box I saw two scorpions sitting in it, with their tails turned over their backs. They were divided from each other by a partition, and were very quiet, but on seeing the light they immediately began to move, so that I had to be careful not to let them escape into the room. Sending for a glass fish globe, I turned the box suddenly over, and with a tap at the bottom shook them out into it. For a moment the scorpions remained quiet at the bottom; then waking up they suddenly rushed at each other, and began fighting

* Poor Lord died in 1873. Peace to his memory.

and wrestling, claw to claw, like two bulldogs. I had great trouble to separate them, and get one of them out of the globe. At last I succeeded, by using two paper knives and a long pair of forceps. I wonder they did not poison each other or myself.

In the course of the morning it was announced that a mouse had been caught in a trap. I immediately thought of testing the poison of the scorpion upon the mouse. The reader must know that my scorpion is a little beast with a body the size of a large blackbeetle. He has small legs on each side like the legs of a lobster, and also two nipping claws. At the end of the body is a tail, nearly two inches long, consisting of five joints, strung together like a portion of a lady's watch chain. At the end of the last joint is the sting, which consists of a horny bag the shape of an apple-pip, and armed with a brown coloured sting having a curve like a bramble thorn. The point of the sting is exceedingly sharp. The general colour of the scorpion is a horrid-looking waxy brown. The eyes of the scorpion—little black shining points—are situated at the top of his head. When preparing to fight he carries his tail in a curve over his back, and brandishes his sting with immense rapidity. He aims his blows directly forward, as a soldier gives a bayonet thrust.

The scorpion was lying quietly at the bottom of the globe when I shook the mouse from the trap into it, but the sudden arrival of a stranger into his private apartments woke him up directly. He hoisted his sting, and began brandishing it about. The mouse shortly crossed his path; the scorpion instantly lunged his sting into

him. This in turn woke up the mouse, who began to jump up and down like a jack in the box. When he became quiet, the scorpion again attacked the enemy, with his claws extended, like the pictures of the scorpion in the signs of the zodiac; he made another shot at the mouse, but missed him. I then called "Time," to give both combatants a rest. When the mouse had got his wind, I stirred up the scorpion once more, and, as "the fancy" say, "he came up smiling." The mouse during the interval had evidently made up his mind that he would have to fight and not strike his colours to a scorpion as he would to a cat. When, therefore, the scorpion came within range, the mouse gave a squeak and bit him on the back; the scorpion at the same moment planted his sting well between the mouse's ears on the top of his head. The scorpion then tried to retreat, but could not, for one claw had got entangled in the fur of the mouse. Then came one of the most ludicrous scenes I ever beheld. Mouse and scorpion "closed," and both rolled over and over together, like two cats fighting. The scorpion continued stabbing the mouse with his sting, his tail going with the velocity and swift spring of a needle in a sewing machine; in fact, the scorpion had the mouse, as pugnacious schoolboys used to say, "in chancery." The moment the scorpion got tired, and the lunges of his tail became less frequent, the mouse got hold of the last joint of his adversary's tail with his paw, and gave the sting a sharp nip with his teeth (it was most interesting to notice that the mouse used his paw). The scorpion at once tried to beat a retreat, but he couldn't get away, as his claws were entangled in the fur.

The mouse seized this opportunity, and deliberately bit two of the scorpion's side legs off. He then retired to the corner, and began to wash his face and comb his fur. I took out my watch to note how long it would be before the poison of the scorpion took effect. I waited minute after minute, and nothing happened; the mouse seemed a little tired, and that was all. When ten minutes had passed I shook the scorpion up to the place where the mouse was sitting. The scorpion was a plucky "Arachnoid," for he tried to come up to the scratch once more; but, as a ship is disabled when she has lost her mainmast by a shot, so "*Scorpio formidolosus*," as Horace calls him, was crippled for further encounter. He tried to hoist his sting, but the bite from the mouse had injured his tail, so that he could not strike straight with it, and it had lost its spring from the wound. Seeing that the scorpion was "lying under bare poles," the mouse sat himself down and began deliberately to eat the scorpion's legs up one after the other. I was at this time obliged to go away to my work, and when, in about six hours, my Secretary came down to my office, he reported that the mouse had shown no symptom whatever of poisoning. When I came back in the evening I went at once to the globe to see what had happened; instead of finding a dead mouse I found about half a dead scorpion, and a live mouse. The mouse had, in fact, made a good meal off his enemy. Some bread had been placed in the globe, and the mouse had eaten this also, so I hope he enjoyed his meal of bread and scorpion. The battle therefore was decided in favour of the mouse, and the backers of the scorpion had to "throw up the sponge," while, as a

reward for his courage, the mouse, after a parting supper of toasted cheese and milk, was let free in a place where the cat was not likely to find him. The friends of the scorpion have lodged a protest, inasmuch as the scorpion was not "in training," and the mouse was not a "fair mouse," being too large and too heavy. For my own part I think the fight was hardly fair, as the scorpion had just come off a long cold journey, and had not eaten anything. The mouse, on the contrary, was fresh caught and in good fighting condition.

THE WOODPECKER AND THE BITTERN.

By a piece of good luck, the poulterer who lives near my house in Albany Street, Mr. Ware, of No. 100, Albany Street, has taken to buy curiosities when he goes to market in the morning. During the Spring of 1874 I obtained from him two birds—namely, a bittern and a woodpecker.

As I am exceedingly fond of dissecting when not engaged in other work, I set to work to find out the anatomy of these birds, and I will now proceed to describe their structure, as I wish to demonstrate what admirable beauty and design may be found in the commonest objects, if only the student of natural science knows how, when, and where to look. The woodpecker I bought is the great green woodpecker (*Picus viridis*). According to Wood it is also called the "rain-bird," "the woodspite," "thew-hole," and "woodwall." In Oxfordshire they are called "eccles," or "heccles." The structure of this bird will, I think, form an answer to the Darwinian theory. In every respect it is most admirably suited to the duty which it has to perform in nature. In the first place, the colouring of the bird is a lovely green. What could be a better dress for a bird who lives in a wood than green? The Foresters parading at their *fêtes*, I observe, wear green coats. The woodpecker has to run

up the sides of trees; and whereas the tail-feathers of a peacock are made to expand, so as to exhibit all the glorious colours of the rainbow, showing that nature intended that this kind of tail should be purely ornamental, so we find, on the contrary, that the tail of the woodpecker is made entirely for utility. The bird has ten feathers on its tail. The two centre feathers are four-and-a-half inches long. They are as stiff as wire, and pointed at the ends somewhat like the head of a spear. The tail-feathers on either side are also spear-headed, so that when the tail is expanded like a lady's fan it forms a most admirable prop, by means of which the bird supports himself as he climbs up the sides of the tree. Whereas the claws of the fowl are made to scratch in the earth, or the claws of the eagle for seizing its prey, we find that the claws of the woodpecker are so acutely curved that they form half a circle. The points are exceedingly sharp, so as to enable the bird to get a firm hold on the roughness of the bark. The hind-claw is very small. The two front-claws are of unequal length, but the middle claw is so situated as almost to turn at right angles with the leg, thus preventing any chance of the bird's slipping. The tongue of the woodpecker, however, is the most remarkable piece of mechanism about his body. If the bill be opened, and the tongue drawn out, it will be observed that it can be protruded nearly four inches from the gape of the beak. It is almost cylindrical, and can be pushed back into a sheath, which fits it, just as a pencil can be pushed back into a silver pencil-case. This is very similar to the mechanism that we find in the long worm-like tongue of the great ant-eater of South

America; but the tongue of the woodpecker presents a structure not visible in the ant-eater, for on carefully examining the top of the woodpecker's tongue, we find that it ends in a sharp horny point, and that on each side of this sharp horny point there are some small barbs directed backwards, reminding me somewhat of the "snatch" made of fish-hooks which is used for poaching salmon. Now we find that the hyoid, or tongue-bone, which works this marvellous tongue, extends not only as far back as the base of the head, as is the case with most birds, but is actually prolonged right *over the top of the head*, and is firmly fixed into the skull, at the base of the beak, on the right side. The reader can easily realize this curious structure if he imagines the tongue-bone in his own head to be extended backwards on each side of the head to the poll, and these two bones to run parallel with each other in a depression on the top of the skull, till they are finally inserted into the bone of the forehead just above the right eye. This tongue of the woodpecker, therefore, may be said to be worked by two highly elastic steel springs, and I have no doubt that in life the bird is enabled to protrude and draw back his tongue with amazing celerity.

But I have not yet done with the numerous mechanisms in the head of the woodpecker. A further ingenious contrivance was, I believe, first described by Mr. Bowman, of Wrexham; who writes thus:—

"In the back part of the palate," he says, "is inserted a longitudinal groove, which tapers to a point outwards, and is fringed with stiff hairs pointing towards the throat. Without this provision it would be difficult to conceive

how the bird could so easily and speedily detach its food from the barbs of the tongue as it is known to do, particularly as the groove in the palate is placed much too far backward for the tip of the former, in the natural position, even to reach it; and, even if it could draw it in so far, the peculiar direction of the hairs would prevent their action. We must, therefore, infer (though the motion is performed with such celerity that we can never expect to observe it), that the tongue is taken into the mouth in a reflected position, like that of the frog, and that the tip of it is drawn through the groove, the sharp hairs of which scrape off the insects from the barbs, while the deglutition is assisted by the tubercles on the surface of the tongue, during the first part of the operation of drawing it into the mouth."

The stomach of the woodpecker is not at all like a gizzard such as we find in many birds; it is simply a fleshy bag. I was pleased to find the stomach was, in this case full of food. On opening this bag-like stomach, I discovered a mass of a black-looking substance, which, on turning it into water, I at once discerned to be black ants, in number sufficient to fill an egg-cup.

The police of nature ordains that these ants should eat decaying vegetable matter, especially in fir woods, where their nests are frequently robbed for the sake of feeding young pheasants with the eggs. Mr. Jamrach imports sacksful of these eggs from the forests in Germany.

May we not also learn a practical lesson from studying the habits of the woodpecker? I frequently hear complaints that the pine forests in this country and Scotland

are seriously injured by a beetle which bores into the sprouting tops of the pine trees, and thereby does great mischief to woodland property. If the proprietors of the forests are so foolishly ignorant as to allow the woodpecker to be shot, it serves them right that their trees are injured; when in the pretty harmless woodpeckers they have valuable servants who would, without being paid for their trouble, find out these insect pests on the pine trees, and very quickly dig them out of their retreat by means of their sharp-pointed bayonet-shaped bills. Woodpeckers are getting gradually more and more scarce; owners had better take the hint at once and preserve them, otherwise they will soon be nearly, if not quite, exterminated.

I will now venture to make some observations on the bittern. The bittern is, I am sorry to say, also getting very scarce in this country; he lives in the most retired places he can find, and especially among rushes and reeds. He is a nocturnal bird. What a contrast do we immediately find between the colour of his coat and that of the woodpecker's. Instead of his feathers being of a brilliant green, they are of a brown black, mixed with buff; the general colouring is in fact much like that of the common brown owl. The feet, instead of being adapted for climbing, are admirably arranged so as to support the bird's weight when walking on marshy ground. The toes have, when spread out, an expanse, from the top of the middle claw to the end of the back toe, of a little over seven inches, and when extended they cover a space of nearly six inches from side to side; the legs are of a peculiar green, like common duckweed. On carefully examining the feet, it

will be found that one side of the middle toe of each foot is serrated. The serrations, examined through a glass are found to be composed of a strong horny matter, in fact they form a regular comb. It has been stated by some that the use of this comb on the foot of the bittern—and the same structure is also found on the heron—is to grasp the slippery eels. In my opinion the theory is wrong, for neither herons nor bitterns ever use their feet as organs of prehension. This comb is, I believe, used by the birds to clean off the slimy mucus which collects on their bill and feathers, from the eels and fish on which they prey. It may also be utilised by the bird in dressing the powder patches which are found on this skin.

The stomach of the bittern is a membranous bag; hence we may conclude it eats soft food, such as eels—possibly horse-leeches—certainly frogs, small fry of fish, when it can catch them, and the spawn of fish. A bittern caught once at Abingdon, and kept some months in captivity, was fed on small roach and other fish.

The cry of the bittern called "booming" is very peculiar and entirely suited to the place he inhabits. I have never heard it myself, so I cannot describe it. I understand it is very peculiar. Sir Walter Scott mentions it in one of his poems :—

> "But the lark's shrill pipe shall come,
> At the daybreak, from the fallow ;
> And the bittern sound his drum,
> *Booming* from the sedgy shallow."

I was therefore anxious to examine the vocal organs of the bittern. The trachea or windpipe bifurcates within

the chest, and at the point of bifurcation I discover the musical apparatus. It consists of a series of cartilages which, when extended, are nearly two inches in length, and shaped like a conical fool's cap. Between these cartilages, extended from side to side, are exceedingly delicate membranes, like the thinnest parchment. This musical instrument reminds me very much of a kind of banjo used by the natives of Central Africa. In fact, it is a regular drum, and I propose to submit it to the examination of a maker of musical instruments. It may be possible for him to obtain from it some hint for the manufacture of a new kind of musical instrument.

NETTING THE FISH IN THE SERPENTINE.

The Right Honourable A. H. Layard, when First Commissioner of Works, was kind enough to promise that I should be informed when the water would be let off from the Serpentine previous to its being cleared out. I received a notice from Mr. Fowler, the engineer, telling me that they intended to begin to let off the water on the 24th of September, 1869. It was not till the 11th of October (seventeen days afterwards), that the water had sufficiently gone down to enable us to catch the fish. On arriving at the Serpentine everything and everybody was ready for work. I was also delighted to find, in appropriate costume, our friend Mr. Higford Burr, who had come up from Aldermaston Park to witness the fun. An old fisherman from Hammersmith had been engaged with his nets, which were worked from one of the ordinary row-boats of the Serpentine. The old man had brought several nets, all of them of very small mesh, but not "trammels," and without a bag.

It is very extraordinary how a London mob finds out when anything is going on. When we first arrived at the place of meeting there were very few people present, and we made our first haul on to the bank; but by the time we had got the net on shore so many people had

assembled, and they pushed down the bank so heavily on us, that it was almost impossible to do any work at all.

The first sweep of the net brought to shore an enormous shoal of sticklebacks and a few small roach. As the net came nearer to the land the sticklebacks began to dance into the air and over the net, glittering in the sun like a shower of silver spangles. The crowd hailed our first haul with a shout of derision, mixed with groans from the small boys, who had come with their pickle bottles, worsted threads, and worms to enjoy their usual morning's fishing. These little wretches were exceedingly indignant at our proceedings. "Jimmy," said a little urchin to his fellow-angler, "we'd better go home again, the gents is killing all the tittlers." Finding that it was impossible to go on with the fishing where we were, we consulted with the sergeant of police, who told us that if we drew the net towards the railed embankment at the west end of the Serpentine he would order his men to keep the people away from the ground where we were working. The old fisherman then took another turn round with his net; but as the hauling rope was not quite long enough, he had to walk over a bit of ground that looked nice and solid. He had not, however, proceeded many steps before he found himself in mud some five or six feet deep, and every step he took he went further in, floundering about like a great Hippopotamus. Mr. Lee and two or three others joined hands with me, and, advancing into the mud at the end of a chain, I caught hold of the old man's hand, and with a "one, two, three, and away," we gave a good pull at him, and he came suddenly out of the mud with a "flop" like a cork out of a wine bottle. The

crowd shouted and laughed heartily at the old Charon being hauled out of his troubles. We managed to tie a new piece of rope on to the hauling line, and dragged the net ashore. It contained a mass of animated mud; no fish could be seen, but hundreds of little tails flapping the mud in all directions. Lee and I rushed in to secure the lead-line of the net, and in two minutes we were covered with mud from head to foot. Feeling about among the mud and fish, my fingers touched something which I knew must be a monster fish. Catching him by the tail I let him kick till he was quiet, and then came ashore with him; I could hardly tell what he was till I had thrown a bucket of water over him, and I then perceived that he was a big bream. I held him up for the people to see, after the "Behold the head of a traitor" style of the ancient executioner. The crowd by that time had become very dense, and when I held up the struggling bream they gave him a great shout of welcome which would have done honour to a whale.

Mr. Chamberlayne, one of the authorities, had ordered three water-carts to be brought close to the railing, and as the fish were taken out of the net they were transferred in buckets to the carts. Besides the big bream that we caught at the second haul were a great number of little roach and one or two big ones. Finding that our net was not long enough, and that the old man had several others in his boat, we made him join them all together, so as to have a good sweep of the whole water. While this was being done, Lee and myself got on a watering-cart and rode up with the old man to the Round Pond in Kensington Gardens, where the fish were to be deposited. I

never rode on a water-cart before, and particularly one like the present, that had no springs. The jolting was something tremendous, but we managed to hold on, and after all it was not bad fun to ride down the drive, among the smart carriages, on a water-cart. When we arrived at the Round Pond we tilted the cart up, let as much water run out of it as possible, and then turned the fish out with our hands, as the aperture at the top of the cart was not large enough to admit a net. This first cart-load of fish, which was by no means a heavy one, contained about 500 fish, little and big. We came back to the Serpentine on the water-cart at a trot,—about the roughest riding I ever experienced—and found that the men had joined all the nets together, and were preparing for a grand haul; the net was exceedingly heavy as we dragged it towards the shore, and our expectations were not disappointed. The old fisherman was delighted. "Lor', sir," said he, "there's all twenty pounds' worth of fish in the net, and if it had been the Jews' holidays* there might be thirty pounds' worth." At all events there was a tremendous

* During the Jews' holidays the Jews in London consume a large quantity of fish; they are more especially fond of fresh-water fish. At this time, Mr. Brougham, Secretary of the Thames Angling Preservation Society, is obliged to put on extra watchers, to prevent the fish being poached.

The Jews' holidays are—

1. Pesach, or the Passover, the later Paschal festival; our Easter or Spring.

2. Seeboot, the feast of weeks, or Pentecost; corresponding with our Whitsuntide.

3. Succoth, or Tabernacles, *i.e.*, Booths; corresponding with our October or Autumn, when people seek shelter.

The Jews are very careful about their diet, and are exceedingly clever in cooking fish. I believe they cook them in boiling oil.

lot in the net. We filled three water-carts as full as we dared with these fish, and away we went again to the Round Pond, Lee sitting on the advance cart, and myself on the rear cart.

This time we had a strong escort of hundreds of dirty little vagabonds, shouting, laughing, and wild with excitement. Looking into the water-cart, I found a few dead fish on the top, and when we got into Kensington Gardens among the trees, in answer to the cry, "Give us a fish, master," I threw them out for a scramble. The little urchins raced after them like greyhounds, and fought for them on the ground, a dozen at a time, like hounds breaking up a fox. It was quite a treat to see how these boys enjoyed themselves; being English boys I suppose they have a natural love of sport in them. I don't believe they wanted the fish a bit; but it was the fun of seeing us draw the net, hunting the water-cart, and scrambling for the dead fish that seemed to amuse them so much. We had so many fish in these three carts that I found it perfectly impossible to count them; so I got the men to run the cart as near to the edge of the water as they could, and then we tilted it up as far as we dared. Having done this I opened the door of the cart, and there poured out a regular cataract of struggling fish. About twenty or thirty of them were sickly, but altogether we lost really very few indeed. The water-cart which carried the third load of fish was of a different construction from the others, and Lee and myself found it very difficult to get the fish out of it. We, therefore, backed it a little way into the water on the sloping bank, while the men on shore tilted up the shaft, and it was here an

accident occurred. Lee was standing in the water taking the fish out of the hole in the cart, and I had that instant moved on one side, when I saw the cart moving deeper down into the water. "Look out, Lee," I cried, "she's got way on her," but in a moment, before there was time for thought or action, this infernal water-cart, fish, water, and all, "turned turtle," and made a summersault clean over, "end for end." The great shafts came rushing down from above like two scaffold poles, and the body of the cart fell right over into the water, wheels uppermost, making a tremendous splash and sending the water flying high into the air. My first thought was for my friend Lee; he had luckily run backwards when he heard my shout, but could not get far enough to escape the shafts; something came down upon him with a tremendous crash, and he disappeared clean under water. I rushed immediately into the water, nearly to a swimming point, and got hold of his collar: he came up in a second, blowing like a grampus, and I was glad to see he did not appear hurt. I think, however, that he was a little stunned, although he said he was not.

If the shaft had hit him on the head the result would have been very serious. He had a narrow escape and no mistake.

The crowd standing round stood like a lot of marble statues; nobody offered to move, or say, or do, or suggest anything. Upon my word, I think an English crowd is either very selfish or exceedingly stupid. I think the people of the present day are a great deal too highly educated, as it is called. They are too clever to think or act quickly enough in a case of emergency. Competitive

examinations will never teach presence of mind, or suggest a remedy for a sudden accident.

After we were both thoroughly wet, I think we worked very much better than in the morning, for before the sun set we had made several more hauls and sent up four more cartloads of fish. It was after dark and getting cold when I went up with the last cartload, and when I got to Kensington Gardens the gates were locked, so I had to put that lot of fish back again into the Serpentine. The total result of our day's work was eleven water-carts-full of living fish; each cartload I average at about 500 fish, little and big, and that would make altogether over 5,000 fish. This is not so many fish as I expected we should have found. All about the mud I observed great lumps of lime; this lime I understood was thrown into the water to purify it some three years ago, and it doubtless destroyed very many of the ancient inhabitants of the place—how many we cannot tell. If lime had not been thrown in, our take of fish would have been very much larger than it was.

The greater majority of these fish were little roach from two to four inches long; there were, I suppose, from 200 to 300 large roach; the biggest weighed 2 lbs., and there were many from ½ lb. to 1½ lb. We did not catch any common carp at all, but considerable quantities of some small Prussian carp, and also a fair number of crucian carp. The largest of these weighed 1 lb. 9 oz. (I took the precaution to bring a pair of weighing scales with me, and weighed the fish as they were put into the pond.) There was a fair sprinkling of little tench, and eight big ones from 2 lbs. to 3 lbs. each.

I expected, of course, to find a great many eels, but not a single one was seen or heard of during the whole of the netting, and the men who were working in the mud told me they had not seen one move. Subsequently one of the labourers found a fine eel in a hole in the mud. He weighed 6 lbs.,—large for an eel; the taxidermist who stuffed the skin ate the flesh for dinner. It made him and his family very ill for several hours. A cast of this fish is in my museum. An old boatman told me he thought the lime had killed all the eels.

I also thought we should find a great number of perch; strange to say we only caught one, and he was a cripple, for his upper jaw was rounded into a knob like an apple, and his deformed face looked like a pantomime mask.

The largest fish we caught were bream, but there were only five big bream; the biggest weighed $5\frac{1}{2}$ lbs. and measured 22 inches in length and $8\frac{1}{2}$ inchss in depth; the smallest of these five weighed $3\frac{1}{4}$ lbs. Besides these, there was a considerable number of little bream, the size of the palm of one's hand. Of course, everybody expected to catch some large jack, but there was not a single jack or anything like a jack in the whole of the lake. We also caught four very fat and red gold-fish; and three large bleak. We also caught either the *first* or the "*last* of the Mohicans," viz.: *one* gudgeon, but he was a "whopper." A little trout eight inches long and weighing 4 oz. came up in the third haul. This little fish is a "great lake trout," and must be the sole survivor of a family of "little great lake trout" that I had put into the Serpentine some two years before. The fish was fat and well coloured.

It was a very extraordinary thing to remark that, as a rule, the fish we caught were either very little or very big; there seemed to be no intermediate size. I cannot quite account for this, but it is worthy of remark that there were no predaceous fish among these herbivorous fish. It is generally the case where you have too many roach or carp, and no jack or perch, *i.e.*, all sheep and no wolves, the fish are exceedingly abundant, but are all very small. It is necessary in stocking ponds always to consider the balance of life, and put into them such fish as will keep down superabundant population, and therefore prevent degeneration of the stock of vegetable feeders.

For my own part, in all cases where fish-ponds are to be emptied, I should advise the water to be drained away as much as possible, the mud to be left alone, and a crop of cabbages or rye grass to be planted on it. The mud would then lose much of its moisture, and could be carted away much more easily than in its original semi-fluid state.

Besides the fish, we dragged up some curious relics from the bottom of the Serpentine. At almost every haul we brought to land a wreck of a model sailing yacht. These little vessels lie in great abundance in the mud at the bottom of the Serpentine: they get upset in their voyage from shore to shore, and are never rescued by their owners.

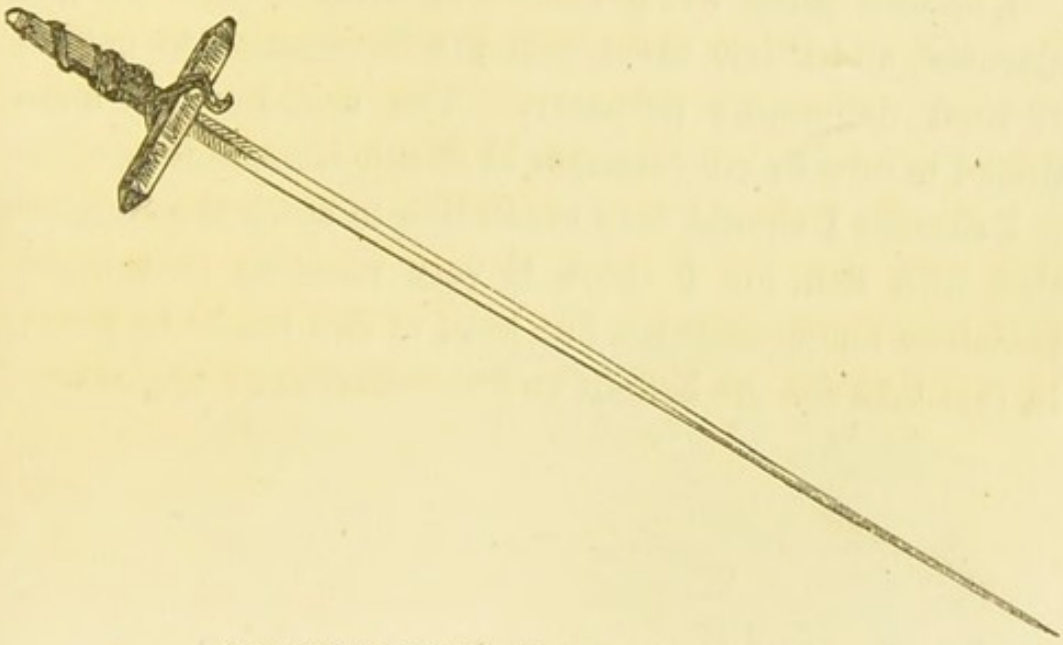
If the relics that we brought up with our net had been placed together on the shelves of a Museum, they might afford anthropologists (who have often only the remains of the handicraft of ancient men as guides to find out who and what they were) an excellent study for a picture of London and its natives, and their amount of civilization in the nineteenth century.

I now give a catalogue of the relics which perhaps may one day become evidence of the former existence of London :—

Pickle bottles, wine bottles, soda-water bottles, blacking bottles, ink bottles, physic bottles, ginger-beer bottles, beer cans, sardine cases, coffee-pots, tea-cups, egg-cups, shoes, boots, pipes without end, dogs' bones, cats' heads, skate straps, gallipots, a top of a lamp, india-rubber balls, cocoanut, curtain rings, a loaded shot cartridge, an iron weight. Here there is plenty of material for any one who wishes to argue out the existence of a big city and the customs of the inhabitants. If this had been the remains of a Roman camp, we should have been sure to find plenty of coins, but English people don't seem to throw their money away in the curious manner that appears to have been fashionable among the Romans. If we ploughed up an English camp, such as Aldershot, we should find that the English soldiers had dropped very few shillings or coppers ; but the Roman soldiers, on the contrary, seem to have spread their money broadcast. I suppose they had no pockets in their armour. One human skull only was found near the bridge of the Serpentine ; there are possibly more human bones in the mud near this "Bridge of Sighs."

Some men were actually engaged digging and examining the mud near the railings at the east end. I was told that they were searching for a casket of valuable jewels which had been thrown into the water by a woman some years ago. The casket was never found. A curious sword was subsequently found in the Serpentine. Mr. Coombe, of Chelsea, was good enough to send me this

weapon, which was dug out of the mud by one of the workmen. It is a bayonet-shaped rapier, thirty and a half inches from point to end of handle; the handle is roughly fixed into a piece of hollow wood, and a leathern strap is rudely bound round it. The guard is made of a piece of rough wood; the point has evidently been ground sharp on a stone. Altogether it is a most formidable little weapon, and evidently made for "business." Of course, I know nothing whatever of its history, though doubtless it had been used for some evil deed or other.



OLD SWORD FOUND IN THE SERPENTINE.

Mr. Lambton Young, of the Royal Humane Society, hearing of this sword, says, "I imagine it must be one of those which were taken out of the lake some years since, just after one of those riots which occur from time to time in London; they appeared to have been hastily manufactured from old scythe blades, and were just such as any mob would extemporise as weapons for any rising against the powers

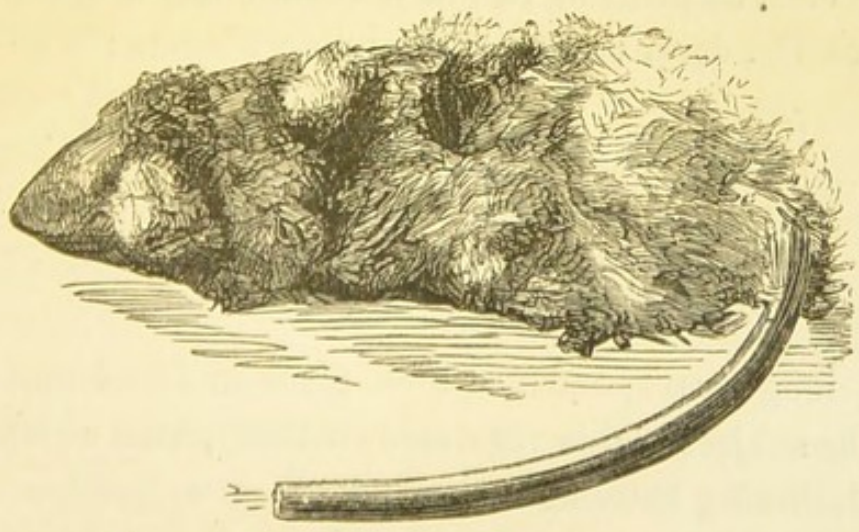
that keep the peace. This mass of weapons was taken possession of by the police, and on my asking for one as a curiosity, I was informed that Sir Richard Mayne had presented them to the Museum of the United Service Institution, where, on application, I found no such things were in the collection. In the end I procured one, which is about two feet six inches long, with a wooden handle similar to a butcher's knife, rivetted through the substance of the blade ; it seems to have been made of an old scythe, and was rough from the grindstone,—altogether, a very nasty weapon for close quarters."

I should think the possessor of these swords became alarmed, and threw them into the Serpentine to get rid of such dangerous property. The sword above mentioned is now in my Museum at South Kensington.

I confess I should very much like to stock the Serpentine with fish, for I think it very possible that, under judicious management, a fine head of fish might be grown in this lake for the benefit and amusement of anglers.

TARTARIAN LAMB.

In 1872 a gentleman sent me an old print which had evidently been torn out of a book. The only printing about it read as follows:—"D. Scott, &c., published for R. S. Kirby, 11, London House Yard, and J. Scott, 447, Strand, Nov., 1803." I described the print in *Land and Water*, and, by the kindness of correspondents, have now been able to obtain a great deal of information about it. The print is taken from Kirby's "Wonderful and Eccentric Museum," vol. i. p. 471, and was copied from Black-



TARTARIAN LAMB.

well's "Curious Herbal." It represents what is called a "Tartarian" or "Scythian Lamb," a species of fern, native of China, with a decumbent root, covered with a dense soft

wool, intensely yellow. The stem is sometimes pushed out from the ground in a horizontal position by the inferior branches of the root, so as to give it some resemblance to a lamb with four legs. This curious plant is personified in Darwin's "Loves of the Plants" as follows:—

"Cradled in snow, and fanned by arctic air,
Shines, gentle Barometz, thy golden hair.
Rooted in earth each cloven hoof descends,
And round and round her flexile neck she bends,
Crops the grey coral moss and hoary thyme,
Or laps, with rosy tongue, the melting rime.
Eyes with mute tenderness her distant dam,
Or seems to bleat—a vegetable lamb."

Sir Hans Sloane has given a print of it, but thinks that some art had been used to give it an animal appearance. (Philos. Trans., abridged, vol. ii. p. 646.) Dr. Hunter, in his edition of "Evelyn's Terra," has a more curious print of it, much resembling a sheep. He quotes Dr. de la Croix's "Connubia Florum:"—

"Surgit humi Barometz præcelso in stipite fructus,
Stat quadrupes, olli vellus duo cornua fronte
Lanea, nec desunt oculi, rudis accola credit
Esse animal, dormire die, vigilare per umbram,
Et circum exectas pasci radicitus herbas."

A long correspondence took place in *Land and Water* on the subject of this vegetable curiosity, from which I give the following extracts:—

"The tale runs, that, 'on an elevated, uncultivated, salt plain of vast extent, west of the Volga, grows a wonderful plant with the appearance of a lamb, having feet, head, and tail distinctly formed, and its skin covered with soft down; the lamb grows upon a stalk about three feet high, the

part by which it is sustained being a kind of navel; it turns about and bends to the herbage, which serves for its food, and pines away when the grass dries up and fails.' Now, it is scarcely necessary for me to point out the fact of this tale being erroneous, for no one, I should imagine, would be found sufficiently credulous to believe that a being, half quadruped, half vegetable, really existed. The fact is, simply, that the rhizome of a fern, *Cibotium glaucescens* (sometimes called *Cibotium barometz*), when destitute of fronds, may, with a slight stretch of the imagination, be said to resemble a lamb, and the fact of these rhizomes being found dead when the herbage is dried is only a proof that the ferns died when the drought set in, which destroyed the surrounding vegetation. The stout rhizome or decumbent stem, is clothed with soft downy hair, resembling fine wool, and this has helped the story considerably. The plant is tolerably plentiful in our ferneries in this country, and it is admirably adapted for the decoration of apartments: but it requires many years to develop a lamb under cultivation. This downy covering is held in high repute by the Chinese, who call it 'poco sempic,' and is applied to wounds for the purpose of stopping the blood."—W. H. Gowe.

"The Tartars call the plant *Barometz* (their name for a rufous dog), and the Chinese terms of *Cau-Fich* and *Kew-tfie* signify the same thing. Linnæus, Reichardt, and various botanists mention it as the 'contorted root-stock of a fern,' and two well-known German writers speak of it as the *Cibotium barometz* and the *C. glaucescens*. One well-attested tale is, that the fresh-cut root exudes a red

juice resembling blood, and another medical fact is that it is an astringent and will stop bleeding. One thing respecting its down I do happen to know. A gentleman of my acquaintance was given a packet of this fine, yellowish, silk-like down by a brother officer (General C——), who had been out in China, and he was informed it would stop bleeding. He tried its power first on himself. He cut his hand severely, and applied the down, as old women do cobwebs, when it stopped the bleeding. Shortly after this the only daughter of a person in our county was suddenly seized with hæmorrhage from the nose at a large party in her father's house. We (the guests, those who knew of it) were alarmed, when the doctor, who had been immediately sent for, found it impossible to stop the flow, and my friend sent his groom off home (ten miles) for the stuff. The poor girl was nearly dead before it arrived, but the blood was soon checked, when once the down had been applied; ordinary plugging of the nostril had previously failed. The Chinese call the down 'golden moss.'"—H. G. W.

"In the museum of the College of Surgeons, can be seen the veritable 'Lambkin.' The leaf stalks have been cut off within three or four inches of the stem, and the stem itself turned upside down. There is a figure of it in Lindley's 'Vegetable Kingdom,' p. 76. There is a notion that so long as grass grows around the lamb it flourishes, but when it dies, the fern dies also."—PETROS.

"I was looking over a very curious old book, translated from the French in the year 1650, of which I now give an extract. The reverend divine alludes thus to the Scythian lamb:—'If, after you have considered all

the parts severally, you but take the whole entire plant altogether, you will yet meet with some such rare figures, as would seem incredibile: did not such excellent historians confirme us in the beliefe of the Relation. Of this sort is the *Boramet*, which grows in *Scythia*, having a perfect resemblance to a Lamb, having a Head, Eyes, Eares, Teeth, and the rest of the parts of the body proportionable. This plant crops and feeds upon all the grasse that growes rounde about it; and when there is no more left it dies of famine. A French poet speaks of it in these verses:—

'Tels que les Boramets, qui chez les Scythes naissent,
D'une graine mince et de plantes se paissent:
Bien que du corps, des yeux, de la bouche et du nez,
Ils semblent des Moutons qui sont nez n'aguerez nez.

'Englished thus by Jos. Sylvester:—

'Such are those Boramets in *Scythia* bred
Of slender seeds, and of green fodder fed:
Although their Bodies, Noses, Mouthes and Eyes,
Of new-yearned Lambs have full the form and guise.'

This is copied literally, and the old mode of spelling carefully retained. I should say it appears to me the third letter in 'agueres' is a mistake of the printer, and should have been 'n' instead of 'u.' Perhaps in those days the same letter did for both."—JACKSON GILBANKS.

OUT SNAKING.

The thermometer showed the temperature of 82 deg. in the sun, when a large party, on Friday, August 8th, 1873, assembled after breakfast on the lawn in front of the hospitable mansion of my kind friend Higford Burr, of Aldermaston Park, Reading. "Where will you go to day, Buckland?" said the Squire, as he gave out the orders of the day to his guests. "Well," said I, "if I have my wish, I should like to go out 'Snaking' in the morning and fishing in the evening. It's a splendidly hot morning, and I am certain some of your snakes, which you preserve so humanely, will be out basking in the park; but we must lose no time, or the snakes will be in." "Those who will go out snaking with Buckland will please hold up their hands; he wants beaters to help," said the Squire. I was delighted to find that a goodly number of recruits, ladies included, would join the snaking party. So we paraded at once. Sticks were cut to hunt for the snakes—not kill them, mind—and the squire and myself carried sticks fork-pointed at the end, in case we should come across a viper, as I wanted to try experiments with the fresh poison. We first drew the "Home Covert," a bank by the side of a garden wall, a favourite abode of snakes; but none happened to be at home; at least, if

they were, they were among the stones of the wall. Forming a regular line, we then hunted carefully along a hillside. It so happened that I had lately been reading Virgil's Georgics and Eclogues out of an old edition of that author, in which I found my mother had written my name when I went to school—dreadful moment: the date is 1839. This same old dogs'-eared school book has been the cause of my being hided and flogged so often at school that for years afterwards I looked upon this very book as representing Virgil personally, and I considered Virgil to be a bitter, spiteful enemy. When I read him—now that his awful hard words have no terror for me—I consider him not an enemy, but my best friend. This fine old poet (who was a fair naturalist also) was evidently fond of the country, and especially woodland country, for he writes :—

"Nobis placent ante omnia sylvæ."

It was evidently very hot weather—I wonder if Virgil had a thermometer—when he wrote his Eclogues, and I would therefore advise my friends in the country to take down their dusty Virgil from the library and "interview" him in the open, especially on a hot day, when the brain is bored and requires real rest from hard mental work. It is very hard work to do nothing; in fact, it is impossible for some busy bees to do nothing and think about nothing.

Although Virgil was born seventy years before our Saviour, at Mantua, he has put into the most beautiful language the ideas which occur to every one of us every day. This is how he describes a day like this Friday :—

"Nunc etiam pecudes umbras et frigora captant.
* * * * * *
Et nunc omnis ager, nunc omnis parturit arbos,
Nunc frondent sylvæ, nunc formosissimus annus."

With my mind, therefore, full of Virgil, I walked steadily along the Squire's park, looking for snakes. A gentleman with us at last made a point. I immediately sang out, "Too—ho, steady!" and motioned him to remain as firm as a pointer-dog till I came up. When I had gradually crawled up, I whispered in his ear—

"Frigidus, O Pueri fugite hinc, latet anguis in herbâ."

But I said "Don't *you* cut away." Virgil probably did not know the external difference between a poisonous and a harmless snake. "I'll have your snake in a minute." Waiting very quietly, we heard the least possible rustle, but could see nothing except that the heather and grass trembled just perceptibly. I could not see a single bit of the snake, or I should have pounced at once upon him, and chanced his being a viper; but, whilst I was considering, Mr. Snake had gone away so quietly into his hole, or hiding-place, that no trace whatever of him could I find. Fixed between two bits of heather, however, I found portions of a cast snake's skin, so that our friend the snake had taken advantage of this fine morning to throw off his old coat, and sport his new summer go-to-meeting garment.

I am sorry, therefore, I did not catch him, because snakes, like ourselves, look better in their new than their everyday working clothes. Virgil describes very prettily the swagger of a snake with a new skin:—

"Cum positis novus exuviis, nitidusque juventa
Volvitur, aut catulos tectis aut ova relinquens
Arduus ad solem, et linguis micat ore trisulcis."

Although "the slough" or shed skin of this snake was much broken, yet it was impossible not to admire the exceedingly beautiful structure of the horny membrane of which it is composed. A snake is ordained by nature to crawl about among brushwood and thorns; we find therefore that his eye is protected from injury by, literally, a pair of spectacles made of horn as transparent as the very best eye-glass.

Having examined the slough, we halted for a few minutes and listened to the remarkable sounds going on all around us. The whole forest seemed alive with creatures innumerable; nor indeed was the vegetable world silent. All around me I heard a sharp crack, crack, crack, like tiny pistols going off, but I could see nothing to account for this peculiar noise. The squire then informed me that the "crack" was caused by the sudden opening of the black seed-pods of the broom plant. I applied a slight pinch to some of these pods, and the spring and crack they instantly gave as they shot out the seeds was very remarkable.

This rest in the forest in midday was very pleasant; it made me, as well as it did Virgil, sleepy, for has he not written—

"Sæpe levi somnum suadebit inire susurro?"

Yes, all very fine, but don't go to sleep on an ant's nest, nor yet in Squire Burr's summer-house, where some gigantic hornets are building their "paper house."

It was quite evident that the grasshoppers were having a "free-and-easy" this hot day, for the merry green-coated things were singing in all directions around us. Again I recollected Virgil. Reader, is not this a pretty line?—

"Sole sub ardenti resonant arbusta cicadis."

When we examine a grasshopper or cricket, it is not very easy at first to see what musical apparatus these insects carry about with them to enable them to make such a tremendous noise. It is only the male grasshoppers that sing, and that's a mercy as times go. The musical apparatus of the great green grasshopper (*Gryllus viridissimus*) has been thus described:—"In that part of the right wing-cover of the male, which is folded horizontally over the trunk, there is a round plate, made of very fine transparent membrane, resembling a little mirror, or piece of talc, of the tension of a drum. This membrane is surrounded by a strong and prominent nervure, and is concealed under the fold of the left wing-cover, which has also several prominent nervures, answering to the margin of the membrane, or ocellus. There is every reason to believe that the brisk movement, with which the grasshopper rubs these nervures against each other, produces a vibration in the membrane augmenting the sound. The males in question sing continually during the months of July and August, especially towards sunset and part of the night. On approaching them they immediately cease their song." With all due deference to the writer, I hardly think this a sufficient explanation of the grasshopper's music. I do not think, of course, the mouth has anything to do with it, and I wish our country

friends would make observations, and watch how grasshoppers give their morning concert.

After a rest we again commenced "snaking," and hunted carefully along the side of a bank of a pond, where the squire's great lake trout are (I trust) doing well. About a yard ahead of me, just as we began work, something shook a tuft of long grass quickly. Before I could speak, the keeper put his foot upon whatever it was that moved. As he lifted his foot carefully, I found a beautiful little lizard underneath. Virgil has watched the habits of lizards :—

"Nunc virides etiam occultant spineta lacertos."

Knowing how delicate these lizards are, I tried to catch him by the head. He slipped my fingers and I got him by the tail, and in an instant, as I expected, his tail snapped right off, and it was most interesting to see the tail kicking and struggling by itself on the pathway. I put it in my hat for an ornament, and I felt it moving for a long time. I do not think that the shed tail of a lizard can ever be joined on to the old stump again, but I believe it is a fact that these creatures have the power of growing a new tail, and that sometimes even two new tails sprout out at one time, just as, when the finger of a "five-finger," (*i.e.*, a star-fish) is pinched, the new one is very often double or deformed. This growing of a new tail reminds me of some wonderful restorative ointment invented by an American. To prove its efficacy, the inventor exhibited a dog from which he had cut off the tail. On applying this ointment to the stump, a new tail grew on to the dog. He then took the tail of the dog just cut off, and anointed

it with his ointment. Immediately a new dog grew on to the end of the old tail.

Just as I had put the lizard into a bag, I heard the Squire's voice signalling me from the distance. He apologised for my want of sport in my snaking expedition, but at the same time he delighted me by promising to guide me at once to a dung-heap, where it was reported that some snakes had laid their eggs. This dung-heap was situated in the middle of a yard where the cows lived in the winter, and was just the very place snakes would choose to lay their eggs. The keeper got a dung-fork, and diligently turned over the straw at the top, while the Squire and I worked away at the sides of the dung-heap. We found an enormous number of wood-lice, little and big, and one diabolical-looking, jet-black, carnivorous beetle, with tremendous jaws. Upon the back of this beetle, curious to say, was a great bunch of creatures looking like white lice. I emptied a fusee box, and put the beetle in, but somehow or other the brute escaped, and I believe he was alive for some days in one of my numerous pockets. Our next find on the dung-heap was a grand old toad, living in a beautiful palace all to himself, under a stone. He was evidently there to eat the wood-lice. Virgil calls him one of the pests of the farm—

"Inventusque cavis Bufo;"

but I must cross-examine Virgil some day on his list of "Pests of the Farm." I expect his bailiff or his gardener at Mantua had been humbugging him, even as happens to gentlemen-farmers now-a-days.

I was dreadfully afraid we should draw the dung-hill

blank, but at last I gave a view holloa, when, underneath a bit of the straw, I saw something of a milk-white colour. "Avancez," I said, "go ahead; I'm certain that's a snake's nest." Lifting up the straw most carefully, I was delighted to find first one, then two, then a dozen eggs. The squire and I then proceeded to dissect out the nest with our pocket-knives and a dung-fork most carefully. Snakes' eggs are not quite so large as a blackbird's; they are round at both ends like a sugar-plum. They have no hard shell like a hen's egg, but the shell is composed of a soft elastic substance, like thin wash-leather. Some eggs were lying quite separate. The greater part were, however, stuck firmly together, so tightly that it was almost impossible to tear them apart without breaking the skin. The eggs were not held by a ligature, but appeared pasted together by some strong adhesive gum, end on end. Most of the eggs were quite distended: the shells of some, however, had fallen in, and they looked crumpled. The appearance of the eggs in this dung-heap, just as the parent snake or snakes had placed them, was so striking, that a gentleman, well known for his artistic talent, took a sketch of the egg and the nest.

When the sketch was finished, I proceeded to examine the eggs more closely; there were sixty-four. I do not know from experience how many eggs the common snake lays, but I should say from twelve to twenty. It is, therefore, possible, even probable, that more than one snake had chosen the spot on the dung-hill to deposit their eggs, just as one salmon will deposit her eggs in a favourable place without consideration for the other mother salmon that may precede or follow her.

The temperature of the spot where the eggs were deposited in the dung-heap was about 84 deg. in the sun, and the nest was buried about 18 inches deep on the southern aspect, as though the mother snake knew that that was the best place for the eggs. I then proceeded to dissect some of these eggs. A few of them were blanks, containing nothing, but all the rest were good. When the skin was cut through, a quantity of clear albumen came out, just the same as the white of a hen's egg. Floating in this was a yolk of a much yellower colour than that of the hen's egg, and inside this yolk was discoverable by careful dissection the embryo snake. Out of three I examined, two of the embryo baby snakes were quite lively, but too gelatinous, and as yet not well enough developed, to do more than to give a slight wriggle. The heart, however, could distinctly be seen to beat under the transparent skin for some seconds. The brain, also, was very prominent. I confess I do not know why the brain in the embryo snake should be so large and perceptible, because, when the creature becomes adult, the brain appears very small in proportion to the rest of the body; for, mind you, I don't believe in the wisdom of the snake, except the wonderful Yankee snake who had been caught so often by the tail as he went into his hole, that at last he hit upon the plan of retreating into the hole tail foremost, leaving the enemy merely to confront his head and poison fangs.

The Squire kindly allowed me to take all the eggs out of the snake's nest in this dung-heap, and I placed them under favourable circumstances in a glass bowl in my museum, to find out how long it would be before the

young snakes hatched out. Some say they will hatch out in a few weeks, while others maintain that they will not do so till the following spring. Before placing these eggs in the artificial nest, I made a cast of the whole of them, just as I found them on a portion of the dung-heap. The cast has come out well, and the group now forms a pretty illustration of natural history in my Fish museum.

On our road home we examined another heap of ferns, etc., which the squire had especially put together for the benefit of his snakes. This looked a very likely "draw" indeed, but we turned it all over and did not find an egg or living snake. There were, however, bucketsful of empty shells of, I suppose, last year's eggs. Very few were addled, so there must be a lot of snakes in the park. Everywhere the heap was quite riddled with snake holes. We had nearly demolished this heap, and had hoped to get some snakes at the bottom, when the sound of the gong in the distance obliged our party to retire homewards, I am sorry to say, "snakeless," after having been out "snaking" all the morning. If however we had no live adult snakes, we had sixty-four eggs, nearly all with a live snake in them. On the following morning the keeper brought me a splendid snake, which, probably, may be the mother of the eggs I tried to hatch out; at all events, I have put her with the eggs.

After our snaking expedition a cup of claret was most acceptable. I believe Mrs. Virgil, or some ladies—say Miss Thestylis—at his country house, knew how to brew good summer drinks, or otherwise the poet would not have written :—

> "Thestylis et rapido fessis messoribus æstu,
> Allia serpyllumque herbas contundit olentes."

I believe, therefore, that Virgil was the original inventor of "Badminton." Will some one try the above recipe, for I'll be bound it will turn out a good summer drink, or the grand old Poet would not have immortalised it in his glorious Eclogues.

I have a great deal to say about snakes. Among my many stories I cannot possibly omit that of the

SNAKE WITH TWO HEADS.

Dr. Bowerbank, of St. Leonards, was kind enough in 1872 to send me a specimen of the common English snake (*Coluber natrix*), that was blessed with two heads. This "double-headed nightingale" among snakes is six inches long, and had evidently not long survived his, her, or their birth.

As will be seen by the engraving, the left head—*i.e.*, that which is about to seize the fly—is a little larger than the right head, which grows, as it were, out of the side of the beast. The left head has a fair-sized neck; the right head, so to speak, has no neck at all. The left head, therefore, may be considered to be the head proper, the right the secondary head.

Double-headedness is not uncommon among snakes and fishes. There are in the College of Surgeons two specimens of double-headed snakes. One is, as in this instance, the common English yellow-ringed snake; the other is a small American snake. Every year I have one or two double-headed salmon hatched out in my breeding boxes. They generally live about three weeks, and then die simultaneously. The gills in these double-headed salmon both breathe, but I have never seen them feed.

I once read an account of a double-headed catfish (*Anarhichas lupus*), having been caught in the North Sea. What a valuable specimen this would be. In the College of Surgeons, there is a specimen of a fœtal dogfish (*Squalus*



DOUBLE-HEADED SNAKE.

canicula), with two perfect heads, which unite in one body behind the gills.

Double-headedness is also frequently found in calves,

lambs, kittens, and chickens. Our own species, even, is not free from this deformity.

The most remarkable specimen of this, that I know, is a preparation, in the Royal College of Surgeons, of the double skull of a double-headed male child, born in May, 1783, in the province of Burdwan, in Bengal. These skulls are placed one on the top of the other, and united in this position. Even though the two heads were united, the child lived to be more than four years old, and, strange to say, died from the poison bite of a *cobra di capello*.

HOW I SPENT WHIT-MONDAY AT HARTING.

HAVING been invited by my brother-in-law, the Rev. H. Gordon, Vicar of Harting, near Petersfield, to be present, on Whit-Monday, 1874, at the annual meeting of the Harting Benefit Society, I availed myself of his kindness, as I was anxious to see a country festival. Business prevented my arrival at Harting till the afternoon, when I found the benefit club assembled in a low and very long room in the local inn. This is a very old club. Its age is seventy-five, the same age as the century, and it has doubtless done much good in its generation. The members, 129 in number, are all working labourers of the district. They were mostly dressed in clean smock frocks, and wore gaiters, and hob-nailed boots of extraordinary thickness: each of them carried a white peeled willow wand in his hand, representing the quarter-staves that were fashionable in former days; and all wore a blue rosette in the hat or cap. The 129 members of the club were sitting at deal tables, discussing beer over "churchwarden" pipes, and looked a much more merry, happy party than many an assemblage that I have met at London public dinners. The Vicar had just proposed "Prosperity to the Club," as I arrived, and the band at the end of the room immediately "struck up" such a

lively tune as to immediately inspire some of the members to the "light fantastic." I whispered to the Vicar:—

"Nunc est bibendum,
Nunc pede libero
Pulsanda tellus."

"Leave them alone," said he, "and you will see some fun." Bang! bang! went the drum, the cornet brayed, the trombone worked away like the engines of a P. and O. steamer, and up jumped two or three Herculean ploughmen to dance—such dancing! These good fellows only dance once a year; but it was pleasant to see the "dancing bear"-like movements, which, according to Darwin, might, in a hundred thousand years, develop themselves into the graceful movements we see in a ballet; but the ploughmen seemed to enjoy it, though, from the twinkle in the eye, I fancy they would have much rather had a good go-in with the boxing-gloves or quarter-staff—*ergo*, why not revive "quarter-staff?"—the "pig with the soapy tail," "racing in sacks," "the greasy pole," and, above all, the "quintain," as used by the Normans. By the way, how could the Romans or the Normans have got on without tobacco? Fancy old Julius Cæsar smoking a long clay! How William the Conqueror, when he first came to England, would have enjoyed his cigar after luncheon on a hunting day in the New Forest. We find no traces of pipes, etc., in the graves of these ancient men and warriors. I fear the present generation is different. "I had a son once," said an old sea-captain to a widow who wanted to catch him, "but he was eat up by the cannibals, and they said he tasted very strong of ter-backer."

The Vicar persuaded me, "unaccustomed as I am to public speaking," to address the audience. I forget what I said, but I made them laugh, especially when I told them of a rough-looking chap who came to a contractor, and asked for a job. "Can ye read?" said the master. "No," said Jawdy. "Can ye write?" "No, master, I can't write." "Can ye work?" "No, I can't work, and I don't mean to it." "Why, then, do you come here for a job, if you can't read, write, or work?" said the master. "Well," said Jawdy, "don't fret yerself, governor. I can't work myself, but I am a tremendous fellow to make other chaps work—nobody better."

The party soon broke up, and the "high table" was filled up, and we began a most interesting conversation on local dates. Country people have tremendous memories for local events. I learnt that the church steeple was covered with copper in 1822; legends that the roof of the church was made of oak from the Spanish Armada; curious stories about the Carrol family, now dead and gone, and only represented by an alabaster gentleman outside the church wall, who is gradually being dissolved by the rain and the roots of the moss. The Vicar has promised me—if I am very good—that some day I shall be allowed to scrub up, and soap-and-water this ancient lord of the manor; if Mr. Searle (my secretary) and I can't do him up, I don't know who can. Then came a dispute as to whether Oliver Cromwell had ever been at Harting, and I had it on the authority of Mr. Rookshell, shoemaker, that old Oliver pounded away at Chichester with his cannon, and that he stabled his troop-horses for eight days in the Cathedral. This fact was being argued,

when the band paraded outside, and we were obliged to join in the procession to the vicarage. Then, during a tremendous thunderstorm, I interviewed a living curiosity, in the shape of "Old Mother Sarah," or to put it more politely, "Mrs. Pook." Old Sarah was a wonderfully wrinkled, but handsome old lady; she was sitting huddled up by the fire, after the fashion of very old people; she was not very deaf, nor particularly blind, and she could still talk, "weight for age," against any woman in the parish. Mrs. Pook was born in 1779. "I shall be ninety-five come next Michaelmas," said this venerable old dame, "and I be pretty hearty now, though I'se troubled with the rheumatiz." Fancy, the old woman must have been thirty-six years old when the news of the Battle of Waterloo arrived at Harting. I myself, the Vicar, and a learned friend, a member of the legal profession, tried to pump some information as regards olden times from her, but she was as silent as the Sphynx in the desert. "Can't you recollect something that happened when you were a girl?" I shouted into her ear. No answer. At last she woke up. "Now, sir, I recollects something," she said; "I recollects when I was a gal I was keeping cows, and the cows got over into Farmer ——'s clover field, and the farmer he comes out, and he says to me, 'gurl,'"—and then the old woman rattled out such a volley of oaths—such a shower of swearing, as would make the captain of a Yankee slaver ashamed of the poverty of his vocabulary. It was good old-fashioned swearing, and no mistake. I suppose it was the ordinary language of the day when the old lady was a girl. "Goodness gracious," said the Vicar, "do pray, leave the old woman alone, if that's a sample

of what she recollects." The grave and legend-loving lawyer hid his face, and bolted; Mrs. Vicar, hearing me roar with laughter, appeared on the scene. The old woman had some tea, and I gave her an arm down the steps, and a fee for the specimen she had given us of the manners and customs of the ancient Hartingites. Apropos to Mrs. Pook, I told them at dinner afterwards about the old negro woman, out of whom a learned scholar wished to make capital. "How old are you, mother?" "Don't know." "How old, do you think?" "Can't think." "Well, give a guess." "Can't guess; all I knows for certain I was here in Merriker when Columbus come; I recollecks him well."

The storm being over, we adjourned to the village. There were three very rickety square tents, where they sold nuts, gingerbread, sweetstuff, and cakes, beautifully flyblown, and as hard as board. The rising Hartingites were gorging these, and I congratulated the local doctor. "There's a good time coming, boys," I said, pointing out a group of urchins eating gilt gingerbread pigs and kings and queens, or grinding at whole ounces of "toffy" or farthingsworths of "all sorts"—*i.e.*, sweepings of the counter. Wise in his generation, the doctor telegraphed to London for supplies of "hydrarg cum creta," "pulvis rhœi co.," and other delicacies "now in season." He then took me into his garden, and showed me the head of the humerus of a very large fossil elephant (I think from Himalaya), which he has kindly promised me for my museum.

Away went the band again with a merry march, up the village, by the church, turn to the left, through the big

gate, halt under the trees, a country dance—very country indeed, considering the grass was very long and thick, with plenty of thistles, and an occasional stinging nettle. I never despise the manners and customs of the natives. Now I see why thick boots are necessary for such festive occasions. The ladies began to take part in the festivity, and the dancing went on so long—so long, I went up to see how it was done. The band was artful, the tune very simple—half of them played a few minutes and rested, then the other half began, and so on. But the dancers were determined on having their money's worth, particularly a certain stalwart damsel, who looked as though she would dance for ever, if properly wound up. In the meantime, I inspected some ancient fish stews, the property of Lady Featherstonehaugh, of Up Park, and sighed to have the command of them (perhaps I may), to show that my theory of the cultivation of fish-ponds is really practical. With me were a troop of little nephews and nieces, and I taught them—especially Master Frank, a bright little boy—the art of wading in the mud and keeping their eyes open. We discovered and examined several tadpoles, some water newts, water spiders, a dead duckling,—on which I showed the children how to make a "*post-mortem*,"—and above all, a stickleback tending her nest. I sent my page-boy, John (who had persuaded me to bring him from town on the strength of his having on a previous occasion found at Harting the skull of a dead rabbit), to the vicarage to get a bit of wire and an old pocket-handkerchief to make a net, and a soda-water bottle, while my nephews and nieces and myself in silence watched the stickleback hovering over her nest. Just before John returned, the

stickleback bolted. At last John appeared with a net of illegal mesh, viz., a bit of a lady's veil. How curious it is that young ladies always go about, not only carrying, but actually wearing, a net with an illegal mesh in the form of a veil! For who ever saw a lady's veil with a mesh of two inches from knot to knot, for this is the legal mesh? and these ladies who do not know, or who do not certainly observe, "weekly and annual close time," catch tremendous big fish in the form of husbands. Once entangled in this fixed engine, the veil, it's all up with the poor fish. He may flounder a bit; but if he once touches the veil with a fin, he is a "Donner." Young ladies should really be forced by Act of Parliament to give us men our proper "weekly and annual close time."

However, John returned with his net with an illegal mesh, to catch the stickleback. He also returned with a pale face, blood running down his cheek, and a tremendous big hole in the side of his hat. It appears that John, in his anxiety to obey orders quickly, had run behind the cloth of a man who had set up a "cockshy," *i.e.*, three sticks a penny to shy at cocoa-nuts. One of the sticks had been badly hurled, missed the legitimate cocoa-nut, and hit John's "cocoa-nut," which, luckily, was made of such adamantine stuff that it did not crack like the cocoa-nut proper. These "three-a-penny sticks" are like the Yankee's revolver—"If," said the settler, "she don't fetch what you send her for, she'll fetch something else. 'Tother day, I sent her at a haystack, and she fetched a cow; and the owner came out and persuaded me to buy that cow." However, everything has its moral. I now keep a "three-shies-a-penny" cocoa-nut stick on my desk

at home. I have only to hold it, in the attitude of an Australian with a boomerang, at John, if he does not pay attention to orders, and the effect is glorious.

After dinner, we went round the sweetstuff and toy booths in the street, and the Vicar introduced me to a merchant of gingerbread-nuts, who is a great authority on moles. He tends cows for a contractor who keeps a great many of these animals to make concentrated milk for the navy. The moles are of great service; they eat up the worms which eat the grass, and, wherever the moles have been, the grass afterwards grows there very luxuriantly. When the moles have eaten all the grubs and worms in a certain space, they migrate to another, and repeat their gratuitous work. The grass where the moles have been is always the best for the cows. I think it would puzzle even Mr. Darwin, or even the Right Hon. G. W. Hunt, First Lord of the Admiralty, to connect the health of British seamen with the poor despised moles, if they did not know the facts.

The sun woke me up early the following morning, and I went out to see the Vicar's bees. The Vicar is very fond of bees, and they seem to know it, for they never sting him. He and I have some experiments to make, to ask them whether they work by instinct or reason. What tremendous advantages people living in the country have for asking animals questions, but they don't do it. A little four-year-old nephew went out to show me the bees; the little urchin cried to me. "Where am you going, Uncle Frank? you will get stinged"—two mistakes in grammar in one line: rather a family failing, I fear, as Dr. Moberly used to say to me at Winchester School. However,

Master Roderick (named after the late Sir R. Murchison) is a sturdy little fellow, and he climbed up the creeper into the drawing-room window. He wanted help; I would not help him, though I took care he did not fall. When I was a boy I fell into the gardener's water-butt: my father would not help me out; this early lesson has helped me out of many difficulties since. After breakfast we called on my friend Mr. Mitchell, the miller at Harting, and I frightened him dreadfully by quoting horrible clauses in the Salmon Act, apropos to mill-leats and weirs. No salmon ever comes near Harting, except by rail, but sea-trout *may* come up some day to this mill, which is situated (and there is a bridge near, called Elver Bridge) on a very high tributary of the Rother, so that Mr. Mitchell treats me with great respect. Mr. Mitchell says his mangold wurzel will not come up because there has been no rain. I showed him how to pump water on to it from his mill-head by simply attaching a fire hose (which he has got) to the pump connected with the engine of the mill. At the mill I picked up a most lovely section of the jaw of a young pig. The dog had been gnawing it—the marks of his teeth were there; and it showed beautifully how the permanent set of teeth, growing upwards from below, displace the milk teeth.

The Vicar then lionised the church. A real old beauty is this church, and he and my sister—his wife—have done an immense deal for it; their choir is very good; the organ is a fine instrument and well played; and there are several curious old monuments and tablets on the walls. My sister (I tell it to her credit), has put up a window in the church, from her earnings from the sale of paintings

on copper, of wild plants, and birds, and nests, drawn from nature. These beautiful oil paintings make panels of doors, and are great additions to the ornamentation of a lady's drawing-room. While going through the churchyard, the Vicar showed me the top of a stone, that looked like an old grave stone, projecting about five inches from the ground. He said it had been a puzzle for years; there was evidently something carved on it; so I at once took off my coat, and passing my hand down as deep as I could, felt out a raised substance. This put me on the scent, and I tore away at the grass, disturbing a colony of ants, and no end of woodlice. "By Jove, Vicar," I said, "I can feel the outline of a face and arms; I suppose you are master here: do give me leave to go ahead." "Certainly," said the kind Vicar, "go ahead." I then sent for some men I had just before observed, working near the churchyard, at a new wall. With spade, pickaxe, and shovel, we dug most carefully round the relic, I shaking the stone all the time; at last I exclaimed, "She's loose, my boys, up with her." A judicious application of crowbar, pickaxe, shovel, and the arms of myself and three strong men—"One, two, three, and away; up she comes,"—and up came a most splendid half lid of a stone coffin of Purbeck marble, with a figure carved upon it. The head is resting on a pillow, the hands together as in prayer. "Quick, John! hot water, soap, sponge, scrubbing brushes!" and in ten minutes the Vicar, and John, and I scrubbed the dirt of ages off this wonderful old relic. We then, with reverence and tenderness, put him into a wheelbarrow, and carried him, and wedged him up in the porch of the church, where he now is. The Vicar was

delighted. He said the figure of the stone makes his church date back to the Saxons, and this is the very proof he wanted. I have since heard that the Vicar has reason to believe that the figure is that of the great nephew of William the Conqueror.

"Time's up! You must be off to catch the train. Hark! the church clock," said the Vicar, so I gave the men a fee to drink the health of the old gentleman we had just discovered—the Vicar's oldest parishioner, a thousand years old at least.* We jumped into the pony carriage, made the fat old grass-fed nag trot along, and away I

* The Vicar writes in the *Athenæum*, Aug. 8, 1874 :—

"CARDINAL POLE.

"Harting Vicarage, Petersfield.

"In Dean Hook's life of Cardinal Pole, somewhat doubtful mention is made of his birth at Lordington, about seven miles north-west of Chichester, in 1500. It is singular, however, that the Dean seems to have overlooked the fact that the Cardinal had other ties to the neighbourhood of his birthplace. Had the Dean consulted the archives of his Cathedral, he would have found, in the Register of Bishop Robert Sherburn (Bishop of Chichester, *ab anno* 1508), p. 52, that April 10, 1526, is the date of the admission of 'Reginald Pole (who is described as *clericus*) to the Rectory of Harting, Chich. Dioc., vacant by resignation of William Gibson, last rector; patron, Henry Pole, Lord Montague (uncle of Reginald), acting in commission for Sir Roger Lewknor and Lady Constance, his wife, patrons of the Church for this turn,' &c.

"It further appears, p. 78 of same register, in a list of Pensions, that April 13, 1526 (three days after his institution), Reginald Pole made a pension of 24*l.* out of the fruits of the rectory of Harting, part of which was to pay for the salary of *Warblyngton* diocese, Winton, another place in the neighbourhood of Lordington.

"Reginald Pole continued to be rector of Harting, for the Valor Ecclesiasticus (1535) describes him as rector of Harting ('clericus rector ibidem').

"H. D. Gordon."

went at it again—official work—inquiring into weirs, pollutions, close seasons, mesh of nets, etc. In the railway carriage, good reader, going to Exeter, I write these lines to let you know how pleasantly I spent Whit Monday, 1874, at the hospitable vicarage of Harting.

THE BRIGHTON AQUARIUM.

JUST one hundred and twenty years ago a very small but very remarkable book was published. The title of it was "A Dissertation on the Use of Sea Water in the Diseases of the Glands, Particularly the Scurvy, Jaundice, King's Evil, Leprosy, and the Glandular Consumption; translated from the Latin of Richard Russell, M.D., by an Eminent Physician. 'The sea washes away all the evils of mankind.'—*Eurip., Iphig. in Taur.*, v. 1193. London: Printed at Homer's Head, Temple Bar; and R. Goadby, at Sherborne, 1752."

This little book caused quite a revolution in the habits of the Londoners of that date. Previously to its publication invalids were accustomed to seek restoration to health by visiting Bath, Cheltenham, and other inland places in order, as the phrase then was, "to be removed from the noxious fumes of the sea." As I have heard the story, Dr. Russell established himself at Brighton. He—or rather the fine sea air—cured the patients that were sent down to him, and this, according to the story I have heard, was the first beginning of Brighton, then simply a fishing village called Brighthelmstone.

Brighton has now a new and most interesting attraction in the Aquarium. The visitor who walks into this palatial

edifice, which does Mr. Birch, the architect, the highest credit, can have no idea of the vast amount of labour, thought, and money which have been expended on it. An Aquarium on such a large scale as this has never been built before; it is, in fact, a Solomon's temple among aquaria.

Up to the present time we air-breathing people have had but little dealings with the fishes of the sea; the only occasions on which we have had the opportunity of "interviewing" them have been either when struggling for their lives with a sharp barbed hook through their jaws, or else as netted fish, jumping about in wild confusion as the seine is hauled up on the shore, or the purse of the trawl-net is emptied out on to the deck of the vessel. How different do these wondrous fish look now that they are tamed and made pets of!

The first idea that struck me was that fish are lazy creatures; as long as they get their food regularly, and have nothing particular to do but to lounge about, they are perfectly happy. I know several people that are very fish-like in this respect.

These aquarium fish have nothing whatever to do except to stare at the visitors, who stare at them, a plate glass alone intervening between the two representatives of the "Vertebrate kingdom," as Peter Parley would have it. "A cat may look at a king,"—by the same rule why may not a "Cod make eyes at a Brighton belle?"

I doubt very much whether any Brighton lassie could find a prettier object to put in her hat than a live herring. The herrings at the Brighton Aquarium are perfectly beautiful. As they swim about, their lovely scales glisten

and glitter with gold, silver, and ruby colours all intermixed. I think it would puzzle even Rolfe—the Landseer of fishes—with all his talent, to paint a live herring. These herrings, too, seem to me to have artful-looking faces. They always swim together, and it appears to me they have a leader, who shows them the road. They swim up to the glass, halt like cavalry, then "threes about," and away they go again. They are rather restless; they want to go somewhere. Where *do* you want to go, my dear fish? Far, far away, no doubt, into the deep ocean's sea-weed forests. But we have got you now, and we intend to make you tell us some of your family secrets.

Then, again, there are the mackerel—"the same old mackerel" that have been there ever since the aquarium opened. They have grown. Why not? they have nothing to do but eat, sleep, and grow; and the late Mr. J. K. Lord used to say he was certain they *do* sleep. All day long they are going round and round their tanks, ever restless. When one comes noiselessly at night, and turns on the light of one's bull's-eye upon them, one sees them poised in the water perfectly motionless, not a fin moving. This is discovery No. 1, made at the Brighton Aquarium.

The cod in the big tank are splendid to behold. *Quantum mutatus ab illo.* How unlike—how very unlike—is a live cod to the flabby, big-headed creature one sees on the fishmonger's slab! The live cod is an intelligent-looking creature. Truly he has an immense mouth and great rolling eyes, but can't he swim! He goes as easily and as swiftly as an express train. A slight move of his tail and away he goes, darting like an arrow. There is a

big cod in the tank—such a fine fellow. I never saw such a big cod alive in captivity before. It is worth going all the way to Brighton to have a look at him. The other cod, smaller fellows, follow this big cod about the tank. I suppose they imagine he must know where he is, and "all about it," so they keep in his wake. I have seen the same thing on land, little fish following big fish because they are big fish. So we see that size and swagger go down as much among the fish as they do among our noble selves.

In another tank can be seen five gigantic cod, as large as the largest cod generally seen on the fishmongers' slabs. These magnificent fish seem to be very sociably inclined; they swim about not separately, but in a group. For the most part they keep to a certain place where two rocks form a sort of cavern, and they keep on swimming round and round their home in a quiet, listless sort of manner, from which I conclude that they have nothing on their minds—no bills, no Christmas boxes, no midnight waits, no coal accounts, etc., to pay. Happy cod! no thought of oyster sauce in the distance! They seem to take their turns in swimming under a certain ledge of rock, and swimming out again, with their great eyes rolling about, and their features looking as jolly and as expressive as is possible for fish. I fancied sometimes I saw a smile steal across the face of the largest cod. How do we know these fish have not a language? They don't speak, certainly, but they may converse by the eye. We have all heard of "the language of the eye."

What can be more lovely than the Sapphirine Gurnards? These pretty, like-cat-faced, fish, sit in a happy

party all together at the bottom of the tank; shrimps suddenly arrive from above (it's dinner time); in an instant they are all "alive oh!"; they spread out their lovely fins and hunt the shrimps. Each fin has a margin of the most resplendent colours. Reader, you can't imagine how resplendent the colours are till you see them, and, as the fish in numbers are swimming about, the appearance is that of many gorgeous butterflies dancing a merry dance in a noon-day tropical sun. Well might this fish be called a "butterfly fish." He is very like a butterfly, first because he sits almost motionless for hours together, like a butterfly on a flower, and when disturbed he spreads his lovely wings and soars away, not into mid-air, but into mid-water. Come, come, my Winchester friends, some of you, *do* give us a few pretty Latin verses, or some neatly turned Greek Iambics, about the butterfly fish.

As the very opposite to the butterfly fish, commend me to the turtle. Deep down under many feet of water the poor old turtle is taking a deep sleep. He has a ridiculous look about him. He is dreaming, I am sure he is, or why did he just open one eye slowly and give a kind of a yawn. Poor old turtle; "Wake up, my boy, here s the Lord Mayor's cook coming with a sharp knife; the pot's a boiling, and I fancy I see the inscription on your shell—'Soup to-morrow.'" The conger eels have taken advantage of your sleepiness, you lazy old turtle, for I see four or five of them under your shell. I tap the glass, "Hi! hi! wake up, old man; here is Mr. Lawler with a nice basket of 'sea-grass' for your dinner, and some bits of fish for your cousins, the hawk's-bill turtles." But the old turtle said to me, "How the d—— can I possibly

keep awake in this cursed cold water; my toes are cold; bring me a blanket, a glass of hot grog, and a pipe." "Never mind, my shell-backed friend," I said, "Mr. Lee will bring a steam pipe into your tank in a day or two to warm you, and then you must wake up, and be a little more civil to the visitors, instead of lying there like a fat hog in a sty. If you don't wake up you will be made into soup for the Directors' dinner; so you had better mind."

There are occasions of supreme felicity. They don't come often, but I confess to the immense delight that I felt when I saw *the* salmon in the Aquarium. In the spring of 1873, my friend Mr. Berrington, Chairman of the Usk Board, sent some salmon smolts to the Aquarium.* They all died except one, and friends, fishermen, what can you see now? *This smolt has become a grilse.* It is not a large grilse, not more than ten or twelve inches long, but a pure salmon grilse for all that. He shines like a bar of silver as he swims round his tank, sometimes leisurely, sometimes with the rapidity of a hawk. He is a wonderful and beautiful fish, the first smolt that ever turned himself into a grilse under the ken of us air-breathing mammalia. Naturalists can't live in the water, fish can't live in the air; so we make water cages for our fish, and we observe their wondrous transmutations from one stage of adolescence to another, changes quite as wonderful as the transformation of a dull-coloured hairy vegetable-eating caterpillar, creeping along the ground, into a butterfly, which flies with ease in the air, and which is ornamented with colours, on wings thinner than silver-

* Large glass carboys, such as are used for sulphuric acid, are excellent things for the transport of small fish.

paper—colours far more beautiful than anything that can be painted by artists.

My readers have probably heard of the celebrated Scotch tame smolt. Some fishermen were "yarning" against each other, and at last an old fellow informed the company that salmon-fishery Inspectors and people of that kind did not know their business. They knew nothing about the salmon. "When he was a boy he caught a salmon smolt, and took it home, and after a time he tamed it. He then had to go away for several years, and when he came home again his smolt had grown into a thirty-pound salmon, and was going about the farmyard *picking up seeds with the hens*."

As we lament the poor old rhinoceros at Regent's Park, so we lament our friends the porpoises at Brighton. They were most intelligent creatures, and seemed almost to understand what was said to them; at all events they understood signals and sound, especially when hungry; —as an old saying has it, "The nearest way to the heart is down the mouth." To put this maxim into practice, mem., "never ask a man for a subscription before he has had his dinner." A very stingy man had his portrait painted. A friend, who was always cadging for shillings and half-crowns for something, met the stingy man at dinner. The friend said, "I saw your portrait at the exhibition to-day, and was much struck with it." "Did you ask it for a subscription?" said the stingy man! "No," said the other, "the picture was so like you that I saw that if I had asked it for a subscription I should not have got one."

I think the porpoises were killed by the gas. The last

porpoise used to come to the surface and breathe, taking in a long inspiration, like a spoony sweetheart when he leaves his lady love. The porpoise—spoony or not we cannot tell—sighed so deeply, that he blew out the gas light above his tank, and breathed a lot of gas into his lungs, and he never recovered it. Moral: don't sigh too deeply near a gaslight. Porpoises are only little whales, and we don't know much as yet about whales. I know at least, from information given me from my good friend Captain Gray, of the steamship *Eclipse*, of Peterhead, that the price of whalebone here in London is now £490 per ton. Ladies, who use whalebone for your dresses, see how you command even whales amidst the icebergs and snow of the Arctic regions. "Whales," says the Captain, "are getting very artful, and are bad to catch." Nobody knows much about whales, where, how, when they breed, how long they live, etc. A whale it is supposed, is not fully grown till he is twenty years old. He may possibly live to the age of one hundred or more.

After all, how very little we men know about our fellow-animals, whether living in the water or on the land. These animals don't ask us what to do—they know their own business. I wonder how the whales are keeping Christmas week in the Arctic Seas, and how the seals pass their time. I should dearly like to spend my Christmas among these poor persecuted things. I would not shoot, hurt, or frighten them if they would only take me into their confidence, and admit me into their family circle.

The seals up in the corner, near the platform of the orchestra, appear to be in perfect health, and are, doubt-

less, as happy as seals can be. They are exceedingly intelligent little creatures, and know their keeper's whistle and voice perfectly well. I observe that two of the seals always swim on their backs, while the other swims in the manner of a dog in the water. The two seals which swim on the back are those which were sent from the Arctic Regions by Captain Gray's brother; and Mr. Lawler and myself took them from on board of a Dundee steamer when she arrived in the Thames some months ago. These seals are rather expensive pets to keep, as they daily devour an enormous quantity of fish. I have warned Mr. Lawler to take special care that there are no fish-hooks left in the fish he gives the seals. Fishermen very often do not take the trouble to remove the hooks from the fish which they catch on the hand-lines, and the consequence is that when the seal swallows the fish he swallows the hook also; and the natural result is that the hook becomes the cause of a lingering and painful death to the poor animal.

Seals have the power of making a sound which is not unlike the human voice, and I have heard many "talking-fish," as they are called by the penny showman, pronounce the words "papa," "mamma," very distinctly. The young bladder-nose seal, which I received from Captain Gray some months since, and which unfortunately died soon after its arrival, certainly cried amazingly like a human baby.

The barnacles are very pretty objects. A stick that was thrown ashore covered with goose barnacles, was secured for the Aquarium, and it is truly a wondrous sight to see the shells of the barnacles wide open and the curious fan-like feeders of the animal within, working

away incessantly, grasping at the water. I suppose they catch something, or they would not work so hard.

There is a bottle floating in the barnacle tank, and some barnacles are attached to it. This bottle might have *once* contained some "message from the sea," written in pencil by some poor fellow who found the ship sinking under him in the mid Atlantic. The message perished, but the barnacles clung to the bottle, and very pretty objects they are. There were some whiting formerly in the barnacle tank; but the whiting came round the barnacles, and bit off their feelers one by one as they put them out, so the whiting were shifted, and the barnacles now have an easier time of it. Nevertheless the shrimps in the tank must be a great nuisance to the barnacles, at whose spread-out feelers the are continually nipping.

I was told by Admiral Hall that for many years of his life, when far away at sea, he used to throw over a bottle with a written message in it at least once a day, but these bottles were seldom if ever picked up again. He considered the reason of this was that barnacles attach themselves to the bottles and breed so quickly that they sink the bottles altogether. That barnacles delight to live near the surface is proved by the fact of being found on ship bottoms and floating timber.

Sea-horses—*Hippocampi*. Funny little fellows in a pretty aquarium all to themselves; with curious horse-like heads and little fins which shake like horse's ears. They have also a long fin on their backs, not unlike a horse's mane, and they make it quiver every now and then so that the fin seems to vibrate. But why hold on so with your tails, like so many spider monkeys, my pretty little

fellows? You can swim if you like, I know. See, there's one of you eating a sandhopper, catching him with his trumpet-shaped mouth. Brave little sea-horse! you shall be first favourite for Neptune next Derby!

One of Mr. Lee's great successes are the young dogfish, hatched out of eggs laid in the tanks. These little "sea-puppies" are very pretty, and not a bit nervous. I think we should arrange an Aquarium pantomime for the Brighton children, and let them ride the Hippocampi, and go out with a pack of puppy "dog-fishes" to hunt the herrings and the sprats around the rocks and sea-weed forests of the mighty ocean. We could get up a nice pack of "sea-hounds," and write over their kennel, as was done by a wag over the kennel of a scratch pack of hounds that would hunt and kill anything, "Pro Aris et Focis,"* with the translation:—"For Hares and Foxes."

The octopus tank is in fine order, and it is interesting to see the curious and hideous creature feed. He evidently has good eyesight. The moment a crab is dropped in from above, he spies it from his lurking-place, and out he comes like an ogre from his den; he spreads his great tentacles all round in a circular form, and pounces down on the poor crab, enclosing him in the membrane which connects his eight arms together at their base. The crab has not a chance of escape from this umbrella-shaped covering thrown so suddenly over him. He is instantly seized and devoured; but we have not yet seen the process of devouring. The poor crab seems to know his danger; he has probably never before seen an octopus, yet he is afraid. If I were a crab I should certainly be afraid of

* The Roman soldiers' war cry: "For Homes and Hearths."

an octopus. I wonder if crabs have nerves, and if some crabs have pluck while others are cowards?

Mr. Lawler kindly showed me the "crabbery" in the naturalists' room, where these unfortunate things are kept alive in hundreds (they cost one penny for four) for the octopus's dinner. He dropped in a bit of fish among them. In a moment the crabs near rushed towards it. The crabs at a distance perceiving that "something was up," began to run also, just as Londoners will run to a fire, an accident, or any other gratuitous amusement provided for them by circumstances. In about half a minute there were at least 20 or 30 crabs fastened on to this one bit of fish, a living ball of crabs, in fact. The ball then began to roll. Some crabs fell off the ball on one side, while other crabs climbed up the ball on the other, and then the moving ball rolled away into the other end of the tank, the mass of crabs fighting, pushing, and pinching each other most gloriously.

I imagine, therefore, crabs must be very selfish creatures, and that they act on the principle of first come first served. But yet, do we not learn from this scene the great use of crabs, that is, to sweep up and tidy the bed of the ocean? If these active, hungry, and unpaid little scavengers were not in existence all sorts of dead creatures, fish, shells, etc., would accumulate, and foul the water; but the crabs' business and delight is to eat up all he can find. Therefore, I admire the little crabs for doing their duty, even though they do it unconsciously. Crabs are, in fact, the rats of the ocean, ready to eat up all the garbage they can find. At my own house I never allow a rat to be killed, that is, if I can help it. That

dreadful institution, the London dustbin, becomes replete with the refuse of the kitchen. The rats come and eat up the refuse. Therefore I preserve the rats. I give the dustman sixpence *not* to kill my rats: my Missis gives the dustman a shilling to kill them. It is wonderful how attentive the dustman is to my dustbin!

It is a great feature in human curiosity that, when a great novelist or great poet writes about an animal, the beast immediately becomes celebrated. It may itself be common enough, but when invested with a halo of mystery—and novelists and poets are generally not famed for a profound knowledge of natural history—it suddenly becomes a hero in the public mind. Victor Hugo wrote about the Octopus or man-sucker. Of course, like the Yankee showman, he made his yarn "as good as he could." An Octopus arrives for the first time at the Brighton aquarium; the Directors find to their joy that their new treasure fortunately becomes a subject of correspondence in the *Times*, and for many days we read a good deal about "sea monsters." As the Octopus sits in a squat position at the bottom of his tank, his head is amazingly like that of an elephant, a similarity which is fully carried out by the continual wave-like motions and curlings of his long prehensile arms. I am, in fact, rather surprised that this animal has not attained the name of "the Water-Elephant," a name certainly more appropriate than "devil fish;" for he is not a fish, and there is nothing diabolical about him.

It would be interesting to get a series of drawings of the various organs of prehension as found in animals. We should have upon our list the proboscis of the

elephant, the mouth of the leech, the foot of the New Forest fly, the head of the tape-worm, the curious apparatus on the head of the remora or sucking-fish, the spider-monkey's tail, etc. The body of the octopus is of the shape of a very large swollen pear. It also reminds one of the body of a fat spider. The arms or "cephalic processes" in the Octopus are (as the name implies) eight in number. The preparation No. 2,080 in the Royal College of Surgeons shows the suckers. "These suckers are sessile in this species of *Cephalopod*, and consist of expanded circular discs formed by a duplicature of the integument including radiating and circular muscular fibres. The inner surface of the disc is marked by lines which converge to the margin of the central cavity; the bottom of this cavity is occupied by a muscular substance which can be protruded and retracted like the piston of a syringe. When the animal applies the sucker to any object to which it is to attach itself, the piston is raised and the cavity obliterated; it is then withdrawn and a vacuum is produced, which can be further increased by a retraction of the central part of the disc itself, when the adhesion produced by the surrounding atmospheric pressure is so great, that in the living animal the arm may be torn off before the suckers will yield." This is certainly a marvellous piece of mechanism, well worthy of study, and even imitation, by engineers.

When fishing for whiting at Folkestone, a great "man-sucker" (as the Octopus is there called by the fishermen) came floating past the boat, and I put my hand and arm into the water in his way. In an instant the long arms were coiled round my hand, quick as the end of a driving-whip

twists round a gig shaft; the brute did not bite me; I almost wish he had given me a nip. In the centre of the eight arms is the beak; this is in shape like a parrot's beak, but not nearly so hard or strong. The substance into which his beak is set is something like a bit of muscular tripe, therefore I do not think that the bite of an Octopus would be so very bad. A discussion has taken place in the *Times* as to whether the Octopus would seize a man or not. Certainly he would, if he got near him in the water, though not with the intention of swallowing him, but because he would seize anything moving. I do not think an Octopus would come out of water to attack a man, nor would he, I think, "fly at" a man, for the Octopus moves by going "stern foremost," his long arms being stretched out *behind* his head, looking like the legs of a heron when flying.

The Octopus of the British seas is comparatively a small animal, but in tropical seas there exist, no doubt, Octopi of enormous size. In the "Naturalist Library," Vol. 8, Marine Amphibiæ, we have the following evidence:—

"In the Indian seas a species of eight-armed cuttle has been found of such a size as to measure twelve feet in breadth across the central part, while each arm was fifty-four feet in length, thus making it extend from point to point about 120 feet. He further states that the natives of the Indian Isles, when sailing in their canoes, always take care to be provided with sharp hatchets, in order immediately to cut off the arms of such of these animals as happen to fling them over the sides of the canoe, lest they should pull it under water and sink it." Dr. Shaw writes:—"The existence of some enormously large species

of the cuttle-fish tribe in the Indian northern seas can hardly be doubted; and though some accounts may have been much exaggerated, yet there is sufficient cause for believing that such species may very far surpass all that are generally observed about the coasts of European seas. A navigator, of the name of Dens, is said to have lost three of his men in the African seas by a monster of this kind, which unexpectedly made its appearance while these men were employed, during a calm, in raking the sides of the vessel. The colossal fish seized three men in its arms, and drew them under water, in spite of every effort to rescue them: the thickness of one of the arms, which was cut off in the contest, was that of a mizen-mast, and the suckers of the size of pot-lids."

Denys Montfort mentions that "at St. Malo, in the chapel of St. Thomas, there is an *ex voto* picture deposited there by the crew of a vessel, in remembrance of their wonderful preservation during a similar attack off the coast of Angola. An enormous cuttle-fish suddenly threw its arms across the vessel, and was on the point of dragging it to the bottom, when the combined efforts of the crew succeeded in cutting off the tentacula with swords and hatchets. During the period of their greatest danger, they invoked the aid of St. Thomas, and being successful in freeing themselves from their dreadful opponent, on their return home they went in procession to the chapel, and offered up their thanksgivings. They also procured a painter to represent, as accurately as possible, their encounter, and the danger which, at the moment, threatened the termination of their existence."*

* A correspondent has been good enough to send the following

It is possible that the Kraken of Olaus Wormius, Pontoppidon, etc., was simply a gigantic Octopus. But we must remember that the water in the arctic seas would be too cold for these kind of creatures to grow to such a vast size. In a book (Gesner's "Natural History of Heidelberg," A.D. 1506) there is a very good picture of the Octopus. He calls it a polypus, and gives no special information about it except that the Germans call it "Ein grosser Polkuttel." I wonder if this means "parrot cuttle," the idea being taken from the shape of his beak.

There is in my museum a cast of a very fine Octopus. The animal was given me by Mr. Grove, of Charing-cross. His pear-shaped body measures ten inches in length and five and three-quarters in width—total length from end of body to tip of longest arm, three feet four inches, the longest arm being two feet six inches. This animal when alive must have been a formidable beast.

When making this cast an idea suddenly struck me that the Hydra, which Hercules killed, was simply a huge

information concerning this picture:—"I spent the best part of a day in St. Malo, trying to find if the picture described by Montfort was in existence, and upon making inquiries of several persons who ought to know, besides going about myself, I found that such a picture was not known in St. Malo. However, there appears to be such a story as Montfort speaks of known to the Malosiens, and one person told me that he thought there was a picture at Marseilles painted to commemorate the fight said to have taken place between the octopus and a crew from St. Malo. I might add that there is no church or chapel called St. Thomas in St. Malo. If any one is curious, or wishes to study the octopus, or minard, as it is called here, I should advise them to pass a summer in this neighbourhood, for I have seen as many as twenty taken in an hour. The spring tides rise over forty feet, and a better place certainly does not exist on the channel for the study of all the 'common objects of the sea-shore.'"—TOP KNOT (La Roche Pendante, Dinard, Ille-et-Vilaine.)

Octopus. An author who wrote in 1658, thus describes the Hydra:—"A monstrous dragon with whom Hercules strove, and as he struck off one head, or tentation, so two or three others rose continuously in the room thereof." This is just what would happen if a man fought with an Octopus; for when the conqueror cut off one arm or "tentation"—mark the word—the Octopus would put out another, in its turn to be severed. My idea of Hercules' Hydra being an Octopus was subsequently strengthened by the following letter which I received from my father's old friend Mr. Pentland, who was then residing in Rome:—"I have seen a letter from you in which you put forward the theory that the dread Hydra which Hercules killed was a great Octopus, or 'man-sucker.' I can fully confirm your view from an examination of several Roman terra-cottas in the Campagna and Vatican Museums, where the demigod is represented slaying an *immense Octopus*, which is very correctly represented, although sometimes with more or fewer arms than in the great cephalopod. I think you might see representations of these ornamental tiles in Campagna's work on the terra-cottas of his collection, which will be found in the library of the British Museum. The nearest representation of the living Octopus is in the Gregorian Museum at the Vatican, where it forms one of a series of the labours of Hercules, and is probably of the time of the Antonines. You will see these terra-cottas noticed in Murray's 'Handbook of Rome.'"

Numerous as are the natural history books, and able as are the descriptions and engravings of the creatures given therein, nothing can impress the human mind

so strongly as an examination of the living Octopus itself.

In my fish museum, at South Kensington, can be seen, cut out in wood and painted to life, the exact dimensions of the largest cuttle-fish that has been captured and brought to public notice. The following are the circumstances under which I became acquainted with this valuable specimen.

In December, 1873, I received the following correspondence:—

"Downing Street.

"I am directed by the Earl of Kimberley to transmit to you a copy of a despatch from the Governor of Newfoundland, enclosing, with other papers, photographs of the arm of a gigantic cuttle-fish, recently brought to shore by some fishermen of that island.

"Lord Kimberley is quite willing that you should make such use of these papers, in the interest of science, as you may think proper; but I am to request that his Lordship may be informed in which museum you consider they should be finally deposited.

"Robert G. W. Herbert.

"F. Buckland, Esq."

"Government House, Newfoundland.

"My Lord,—The existence of a large cephalopod in the North Atlantic has been so questioned by naturalists that I am induced to bring under your Lordship's notice the circumstances under which one of the arms of a

gigantic cuttle-fish was secured in Conception Bay, Newfoundland. With this view I have the honour to transmit copies of two letters from the Rev. Moses Harvey, of St. John's, N.F., in one of which he describes the size of the captured arm of that fish, and deduces from certain data the proportions of the cephalopod. In his second letter he describes the appearance of an almost perfect specimen taken recently at Logy Bay, though of inferior size to that seen in Conception Bay.

"I have further the honour to submit photographs of the arm and of the cephalopod, illustrative of the descriptions contained in Mr. Harvey's letters.

"I trust that your Lordship will be pleased to forward the enclosed documents and photographs to the department of science in London to which they relate.

(Signed) "Stephen G. Hill."

Mr. Harvey writes as regards the cuttle from which the arms were cut:—"Two fishermen were out in a punt, on October 26, off Portugal Cove, Conception Bay, about nine miles from St. John's. Observing some object floating on the water, they rowed towards it, supposing it to be a large sail, or a wreck. One of the men struck it with his 'gaff,' when immediately it reared a parrot-like beak, which they declare was as big 'as a six-gallon keg,' with which it struck the bottom of the boat violently. It then shot out from about its head two huge, livid arms, and began to twine them round the boat. One of the men seized a small axe, and severed both arms as they lay over the gunwale of the boat, whereupon the fish moved off, and ejected an immense quantity of inky fluid,

which darkened the water for two or three hundred yards. The men saw it for a short time afterwards, and observed its tail in the air, which they declare was ten feet across. They estimate the body to have been sixty feet in length, five feet in diameter, and of the same shape and colour as the common squid; and they observed that it moved in the same way as the squid, both backwards and forwards.

"One of the arms, which they brought ashore, was unfortunately destroyed, as they were ignorant of its importance; but the clergyman of the village assures me it was ten inches in diameter, and six feet in length. The other arm was brought to St. John's, but not before six feet of it were destroyed. Fortunately I heard of it, and had it preserved; Mr. Murray, of the Geological Survey, and I, afterwards examined it carefully, had it photographed, and immersed in alcohol; it is now in our museum. It measured *nineteen* feet, is of a pale pink colour, entirely cartilaginous, tough and pliant as leather, and very strong. It is but three inches and a-half in circumference, except towards the extremity, where it broadens, like an oar, to six inches in circumference, and then tapers to a pretty fine point. The under surface of the extremity is covered with suckers to the very point. At the extreme end there is a cluster of small suckers, with fine sharp teeth round their edges, and having a membrane stretched across each. Of these there are about seventy. Then come two rows of very large suckers, the movable disc of each an inch and a quarter in diameter, the cartilaginous ring not being denticulated. These are twenty-four in number. After these there is another group of suckers, with denticulated edges

(similar to the first), and about fifty in number. Along the under surface about forty more small suckers are distributed at intervals, making in all about 180 suckers on the arm.

"The men estimate that they left about ten feet of the arm attached to the body of the fish, so that its original length must have been thirty-five feet.

"More than once we have had accounts of gigantic cuttles cast ashore in different localities; but not until now have any of them been preserved.

"By this mail I send you a photograph of the arm; it is one-fourth the original in size. You will readily see the suckers at the extremity of the arm. The discs of several of the larger ones have been torn off by carelessness on the part of the captors. A few of them, however, are perfect, and the smaller ones are not injured."

As regards the entire specimen of the large cuttle, Mr. Harvey writes:—

"Since the appearance of the large cuttle in Conception Bay, I have been fortunate to obtain possession of a *perfect specimen*, though far inferior in size to the monster whose arms were amputated. It was taken in a net near Logy Bay. The body is upwards of *seven feet in length*, and about five feet in circumference. From the head ten arms radiate, two of them each being *twenty-four feet in length*, and armed at the extremities with a cluster of sucking discs, some of them an inch and a quarter in diameter, and furnished with small sharp teeth round their edges. *Eight of the arms are each six feet in length*, and nine in circumference at the junction with the head.

They are completely covered on the inner surface with rows of large denticulated suckers. The beak is in the middle of the centre nucleus from which the arms radiate, and the large eyes, which, unfortunately, have been destroyed, were on each side of this central mass. The remains of one of the eyelids show that the eyes were four inches in diameter. They are dark and beautiful, but, when the creature is enraged, assume an expression of intense ferocity. The beak is sharp and powerful. The fishermen were compelled to kill it by cutting off its head before it could be landed, and it was with great difficulty that three men despatched it.

"Messrs. McKenny and Parsons have succeeded in obtaining admirable photographs* of this specimen. One of these photographs shows the head and surrounding arms, with the beak in the centre. The head is supported on a stand, and the arms hang down with the rows of suckers displayed, and taper to a fine point. The two long tentacles are coiled in short lengths, and hang from the ends of the rail on the right and left of the larger arms. They are about three inches in circumference, and the rows of splendid suckers at their extremities are very distinct in the photograph. The body had to be photographed separately. The formation of the tail is very striking. No specimen at all to be compared with this is to be found in any museum in Europe or America. In the aquaria of Brighton, in England, and Hamburg, in Germany, there are living specimens, but they are not more than two or three feet between the

* These can now be obtained from the London Stereoscopic Company, 110, Regent-street, London.

extremities of the extended arms. This one is forty-eight feet between the extremities of the longer arms, and nearly fourteen feet from tip to tip of two of the shorter arms. "M. HARVEY."

The reader, by going to my museum, can realise from the wooden model the exact dimensions of this giant cuttle.

I could, if space allowed, write much more on the living wild beasts of the sea, caged in the Brighton Aquarium, an institution which will not only enable us to make great advances in the knowledge of marine fauna, but will also much assist in solving difficult fishery questions relating to the management of fisheries. If the establishment of the Brighton Aquarium does not turn out to be a key which will unlock many difficulties in practical history, I shall be much disappointed.

To this marine observatory, therefore, I look forward to the solution of a great number of questions of the highest importance to the national wealth as represented by the fisheries of this country.

When I think of the great secrets of nature locked up from our knowledge (yet under our eyes, at every turn of our daily duty), and imagine what a mine of intellectual wealth remains to be opened out by quickness of sight, clearness of intellect, and the pickaxe of hard work—a great panorama opens before me. How ignorant—how terribly ignorant—are we of God's great laws as applied to the creatures that live in the element in which we are forbidden to exist!

Poor, pretty, silent things, yet endowed with the most

sublime eloquence, if we have only ears to hear, *Fishes* will whisper to us, and talk into our eyes—even if they do not speak louder—the lesson of humility.

To quote my Father's words from his "Bridgewater Treatise," "The sterility and solitude which have sometimes been attributed to the depths of the ocean exist only in the fictions of poetic fancy. The great mass of the water that covers nearly three-fourths of the globe is crowded with life, perhaps more abundantly than the air and the surface of the earth."

It has been so crowded ever since this planet, once "without form, and void," rolled out of chaos, in all its beauty and purity; and the edict went forth, "Let the waters bring forth abundantly the moving creature that hath life. And God created great whales, and every living creature that moveth, which the waters brought forth abundantly after their kind."

When we attempt, in the feebleness of our vaunted intellects, to grasp or get the slightest idea of the millions upon millions of square miles which form the fathomless abyss of the everlasting Ocean, inhabited by fish or other living marine beauties, the human mind is staggered with the thought of the greatness of the Almighty Creator: and man—Adam *the* man—falls prostrate, awe-struck in his littleness and insignificance.

Since the above article has been in print, I have had the honour of rendering my assistance at the opening of the Southport Aquarium. Southport is easily reached from Wigan or Liverpool. There are about three millions and a half of people within an easy "return ticket" from Southport. This magnificent aquarium owes its exist-

ence principally to my friend, Mr. Alderman Smith, of Southport. The aquaria at Brighton and Southport are great educational schools, which will do much to teach kindness to animals, to humanise those but little brought into contact with the living works of the Creator, and above all to break down the ideas of scepticism and infidelity which are now temporary candidates for public approval.

REMINISCENCES OF NATURAL HISTORY IN SCOTLAND.

Scotch Red Deer.

In the course of my official inspection of salmon fisheries in Scotland,* as Special Commissioner, with my colleague, Mr. Young, of Edinburgh, in 1870, I had the

* During my long tour of official river inspection in Scotland, I was more than ever pleased with the Scotch people, the Scotch country, and the Scotch fisheries. My friend and colleague, Mr. A. Young, of Edinburgh, and myself, were most hospitably received, and every opportunity was afforded us of obtaining the information on the Scotch salmon fisheries which it is our pleasure as well as duty to collect. I trust the good folks in Scotland will not take it amiss if I venture to publish some general remarks upon their magnificent country, the resources of which I do not think to be as yet half developed. I will take the subject of railways.

It is a most fortunate thing for commissioners and inspectors of salmon fisheries that railways generally run along the valleys of rivers, so that one's work of inspection is often very much facilitated, especially in getting general ideas of spawning grounds, &c., above weirs, and pollutions. Now where a road can go, a railway, for the most part, can go also; and I candidly confess that, when I was far away up the country, out of the reach of telegraphs and railways, I did not feel half so comfortable as when within their reach.

It is a great comfort to feel oneself within the reach of home by means of rail and telegraph. I am, therefore, a strong advocate for opening up Scotland in every direction. Where there are no railways, the "machine," as a carriage, fly, four-wheeler, etc., is called in Scotland, is dragged along by a pair of wretched horses, which are used for farm work in the winter, and to tug tourists about in the summer; for these

pleasure of meeting many gentlemen interested in the noble sport of deer-stalking, and we conversed much about Red Deer, their habits, management, &c. I only saw one wild live red deer in Scotland, and he was about five miles away, and looked more like an old woman gathering sticks on the hill-side than a red deer. I had only five minutes to look at him; but I examined two or three dead animals that had been shot, and found that there was much to be learnt from their anatomy.

In the first place, I consider red deer must be very clever animals, and not nearly so stupid as sheep. I have weighed the brain of a red deer; it weighs one pound one ounce. A sheep's brain weighs four ounces, and two sheep about equal a 16-stone stag in weight; therefore a sheeps' brain is, in proportion to the size of the animal, only half as large as that of a deer, and it will require four sheeps' brains to equal the brain of one stag.

I understand a certain portion of a deer forest is called "the sanctuary." When a hunted deer has once reached

miserable beasts, I would, wherever possible, substitute the locomotive engine with its glittering brass harness, dragon-like nostrils, and life-inspiring whistle. Many excellent folks build their comfortable nests on a hillside, with a fine view, and glory in the fact that there is no railway within twenty miles of them, that they have thirty miles to send to the nearest baker's shop, and that they have to give their chimney-sweep a bed; the post, moreover, takes two or more days to come from London, and telegrams are unheard of. In such houses, I have felt uncomfortable; the owners, in my opinion, also *ought* to feel uncomfortable; but the answer is, that they "like the country." True, but the rat always leaves a bolt hole to his private establishment, and General von Moltke carefully spun out a telegraph wire behind him towards Berlin, wherever he went with the staff of the Prussian army. Just so, again, a cautious old spider always takes care to spin out a rope up which he may swarm back into his hole should danger threaten.

this sanctuary his life is safe. In proof of the sagacity of the deer I may remark that those which live on the mountains in the neighbourhood seem somehow to find out very quickly which portion of the ground *is* "the sanctuary." A very experienced deer-stalker told me that he had seen a cunning old stag make direct for the sanctuary when he was in trouble. Having arrived there, the knowing old fellow simply lay down and looked at his tormentors, as much as to say, "Ah, now I am in the sanctuary, you can't touch me."

I have several times examined the peculiar blind pouches at the inferior angle of the eye of the red deer. They exist both in male and female. I observed from some tame deer, at Dunrobin Castle, that the animal has the power of contracting or expanding the orifice of this pouch; and from subsequent dissection I find that there is an orbicular muscle, which works it just like the muscle of the human eyelids. In this pouch I always found a mass of wax-like secretion, though the gland which secretes it is difficult to find. I have not the least idea what is the use of this peculiar secretion. When touched with a red-hot iron, it gives out an aromatic smell, not unlike some of the gums used for incense in churches. I went up to see what the living red deer in the Zoological Gardens would say to it. They did not seem to notice the places where I had rubbed it against the bars of their inclosure; but one female red deer smelt very hard at it, and then ate it up. This, however, goes for nothing, as I heard of a fallow deer at Hampton Court eating up a whole box of acidulated lemon lozenges, one lozenge after the other. It may be possible that this wax-like secretion has some-

thing to do with the "Bezoar" of the ancient books on Pharmacy.

The horn of the red deer is simply an external bone, which grows out from the skull, taking a thin layer of skin with it as it grows; the skin is called the velvet, and underneath the velvet are large blood vessels which secrete the bone. When the horn has attained its full development the "burr" appears at the base of the horn, and strangulates the blood-vessels (see preparations by the great John Hunter, at the Royal College of Surgeons, London); the velvet then falls off, or is rubbed off by the deer, leaving the horn, *i.e.*, bone in an ornamental shape, exposed. From a deer's head which I found on the rubbish heap behind the kennel at Dunrobin Castle, and which Mr. McDonald, head forester, gave me, I perceive that the two largest arteries which secrete the bone are situated in the *rear* of the horn—an admirable provision against injury during the time the horn is growing. Deer-stalkers should examine these facts for themselves. The deer will often eat the dried portions of the velvet as they fall off the horns; the reason why the velvet from the horn, as served up with deer's fry, is so good is that it is composed of the delicate skin and tender blood-vessels.

The formation of these horns of phosphate of lime and other bone-making material is a great drain on the system, and deer will eat bones if they can get them; and I hear they will even eat their own shed horns in order to keep up the necessary supply; bones should, therefore, be strewed about in deer parks and forests.*

* The Marquis of Ripon tells me that hinds will eat the antlers of the bucks even when they are on the bucks' heads. His Lordship has kindly given me a splendid specimen to show this fact.

The deer in a certain forest in Scotland, I was told by Lord Lovat, once ate up the whole of an old woman; the keepers found strange bits of bone about, which the deer had been gnawing. They traced up these bits of bones, and found the remains of the skeleton of an old woman that had been lost in the forest some long time back. The deer had nearly eaten up the skeleton.

Red deer are very fond of salt. Captain Houstoun told me that deer had been known to go as far east as Peterhead, and drink sea water, getting at it at the end of a bay to the north of the town. I can see no reason why rock-salt should not be put about all deer forests: it would certainly improve the condition of the animals.

Deer-stalkers complain that the heads are getting smaller and smaller every year; of course they are, and it is quite the fault of the owners of the deer forests themselves. It is simply a bit of "cause and effect." Those who breed race-horses select the finest males for the stud, and the breed gradually approaches perfection. Those who breed red deer, on the contrary, select the finest males *for the rifle;* the moment a stag grows horns larger and finer than his brother stags he is doomed to death: everybody is after the "muckle stag of Ben-something or another;" he is ultimately shot, and the breed is not benefited by the continuance of his kind. Nature, however, herself comes to the rescue—the largest stags that are left beat off the smaller stags, *vi et armis.* I was told lately that "Nature had had her day." I doubt it; let owners of deer forests take a hint from Nature, and spare their big stags; I am sure it is the proper thing to do.*

* Lord Ripon tells me that the Duke of Westminster is now carrying out this idea. I am glad the Duke has shown such a good example.

In former times red deer, carrying very large horns, existed in Scotland. I have in my collection a fragment of a gigantic horn, which was presented to me by a gentleman living at Perth. It measures 13½ inches in length, and would be about one-third of the entire horn. The horn is still attached to a portion of the skull. The stag which once carried the horn must have been an enormous animal. I give the following measurements of deer horns for comparison :—

	Round base of horn.	Above brow antler.
Red deer (recent, Windsor Park)	7½ inches.	7 inches.
Red deer (fossil, bed of Thames)	8 „	5⅜ „
Red deer (fossil, Tay)	9¼ „	8½ „

It will thus be seen that the ancient Scotch stag must have been much larger than the Windsor Park red deer, or the ancient English red deer. By comparing the Tay horn with specimens in my museum, and with the figures given by Professor Owen in his "British Fossil Mammals," there can, I think, be no doubt that this is the horn of *Strongyloceros Spelæus*, the gigantic round-antlered deer. It is called Spelæus on account of horns having been found in caves with bones of hyænas, elephants, bears, etc. My father described some horns of this deer, from Kirkdale Cave in Yorkshire, in his "Reliquæ Deluvianæ."

The animal which carried the horn found in the estuary of the Tay was probably drowned, and the carcase carried down by a flood. As the flesh decayed, the bones would fall down separately to the bottom, and become embedded in the mud. There were no deer-stalkers in those days; and getting into a lake or river, whichever the Tay was, he died in the water, and was carried down by a spate.

The same thing is going on now in the case of the dead dogs, cats, pigs, sheep, etc., that we see (unfortunately too often) floating down rivers. Wounded deer, moreover, often seek the water. As regards the size of this ancient Scotch stag (*Cervus Strongyloceros*), Professor Owen writes:—"If the trunk and limbs bore the same proportion to the head and antlers as in the wapiti and red deer, as most probably they did, the species indicated by this remarkable fragment of antler (figured in his book) must have been the most gigantic of our extinct cervine animals." We may, therefore, conclude that in former times enormous deer, as large as, if not larger than, the wapiti of America, roamed over the highlands now drained by the Tay.

Deer horns are often subject to deformities. I have a photograph, sent me by Mr. W. A. Leay, of a stag's head, with very curiously malformed horns, which was shot by the Earl of Stamford and Warrington in his forest of Glenmore.

The head presents a very remarkable deformity; the right horn consists of a single tyne; the left horn consists of a single tyne for about half its length, and then, as it were, suddenly falls over, becoming palmated as in the fallow deer. This palm then sends a branch upwards and another downwards, while there is one very small button in the centre. The photograph was evidently taken before the head was stuffed. May I be allowed to suggest that in all photographs of specimens a scale should be given? This may be done very easily if a foot rule be simply photographed at the same time as the object.

Considering how soft deer horns are when they first sprout, it is wonderful there are not more deformities than

we find in practice. Should a deer injure his horn when soft—say half break or bend it—it will not recover itself. Malformation of horns, however, often depends upon injuries to the internal organs, as was proved some years back by experiments carried out at the park of Sir Philip Egerton. Lord Lovat was kind enough to show me several remarkable specimens of deformed horns in his collection. In one case the right antler stood straight upright, and had no tynes to it at all. The left antler, on the contrary, hung down by the side of the head over the eye, falling like the ear of a lop-eared rabbit. The so-called "crommy heads" of Jura are also remarkable specimens. In one instance the two antlers seem to have united at their base into a solid lump, like the nodules we see growing out of old trees. This deformity seems to be peculiar to Jura. On this point Mr. W. B. Redfarn writes in *Land and Water*, May 8, 1869 :—

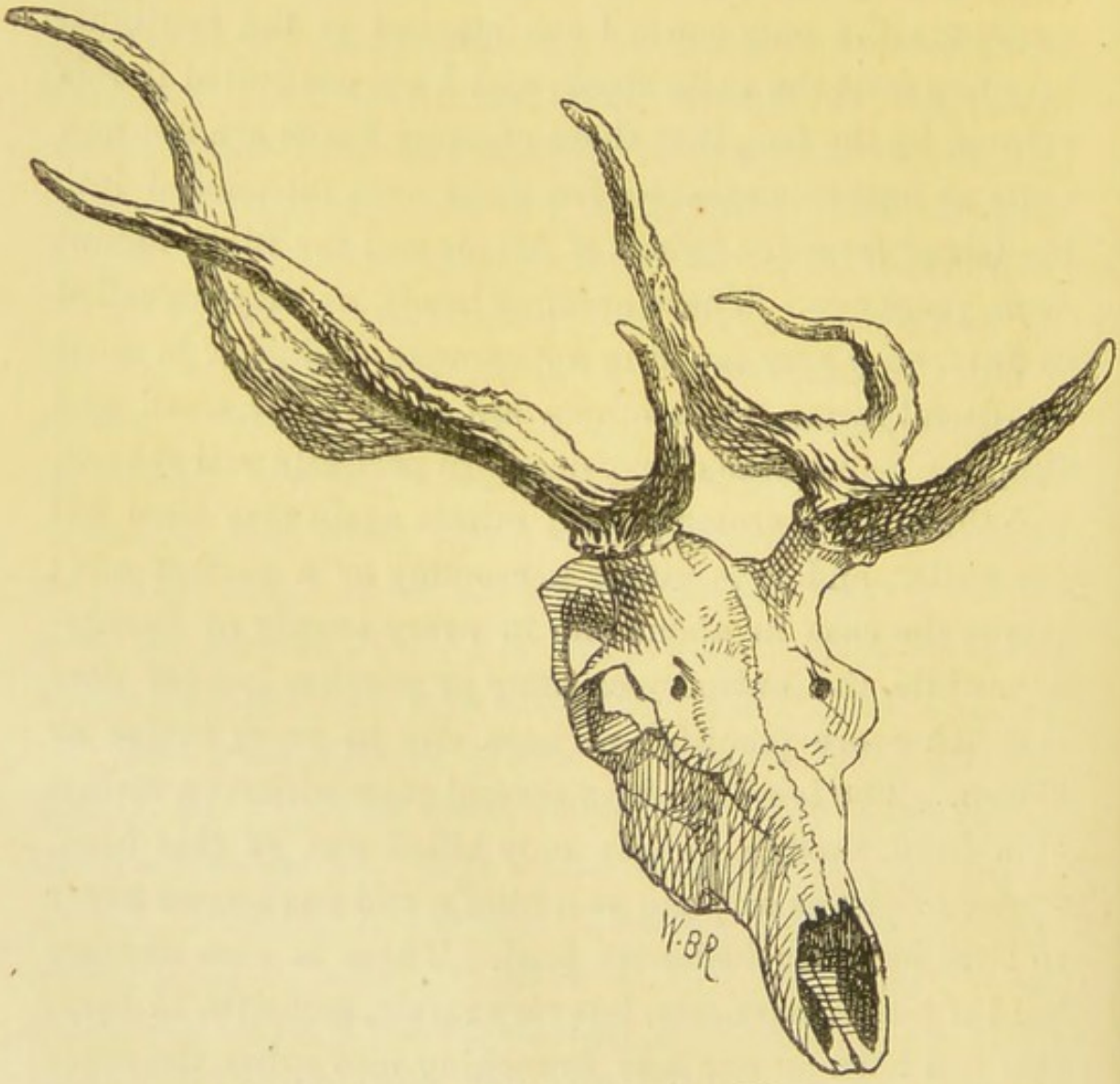
"The extraordinary growth of antlers found on the deer in the island of Jura has attracted the attention of the few persons who have heard of them. Macgillivray, in his 'Natural History of Deeside,' makes a passing allusion to it, and I believe H.R.H. the late Prince Consort sent for a few specimens, but as far as I am aware there has never been anything written on the subject. For the truth of the following notes I can vouch, having received my information from the laird of Jura, and having also myself been long enough in the forest to have seen sufficient to convince me had I been inclined to doubt. It is a well-known fact that deformed and peculiar antlers are often the effect of a wound, but this is not the case with the Jura deer, as one might at first glance suppose, for the

forest being stalked almost solely by the laird, who very rarely allows a wounded stag to escape, it is impossible for crommy heads to be so caused; besides which they abound in such numbers that the idea is out of the question; the only cause I can suggest is the continual breeding from the same stock, and I am confirmed in this opinion by the fact, that these crommy heads are not now quite so numerous since a few stags were introduced into the island from the forests of Athole and the Black Mount some years ago. These crommy heads, as they are called in Jura, vary very much in appearance, and grow in most wonderful forms, while others are remarkably small and simple. Some heads carry one horn perfectly well shaped, and the other a crommy one; others again may have but one antler, and it is either a crommy or a perfect one; this is the case in about one in every twenty or twenty-five, while the ordinary crommy or peculiar headed deer is much more plentiful, perhaps one in every twelve or fifteen. The laird has seen several stags without a vestige of a horn, though he has only killed one of this kind, whose head was as plain as a hind's, and was known never to have been touched with lead. There is also another kind of head sometimes, but very rarely, met with in Jura; this is a horn on one side branching into splits, the other being perfect in form. A deer with horns of this description was killed about three years ago, and was known to have borne, previously, a large heavy upstanding antler of five points, and had, to the certain knowledge of the laird, never been wounded.

"From the accompanying drawings it will be seen that the crommy antlers lie back from the head, very like

those of a goat, at almost right angles with the brow antler, instead of growing up in the usual manner.

"Sketch No. 1 shows a crommy head of six points, the



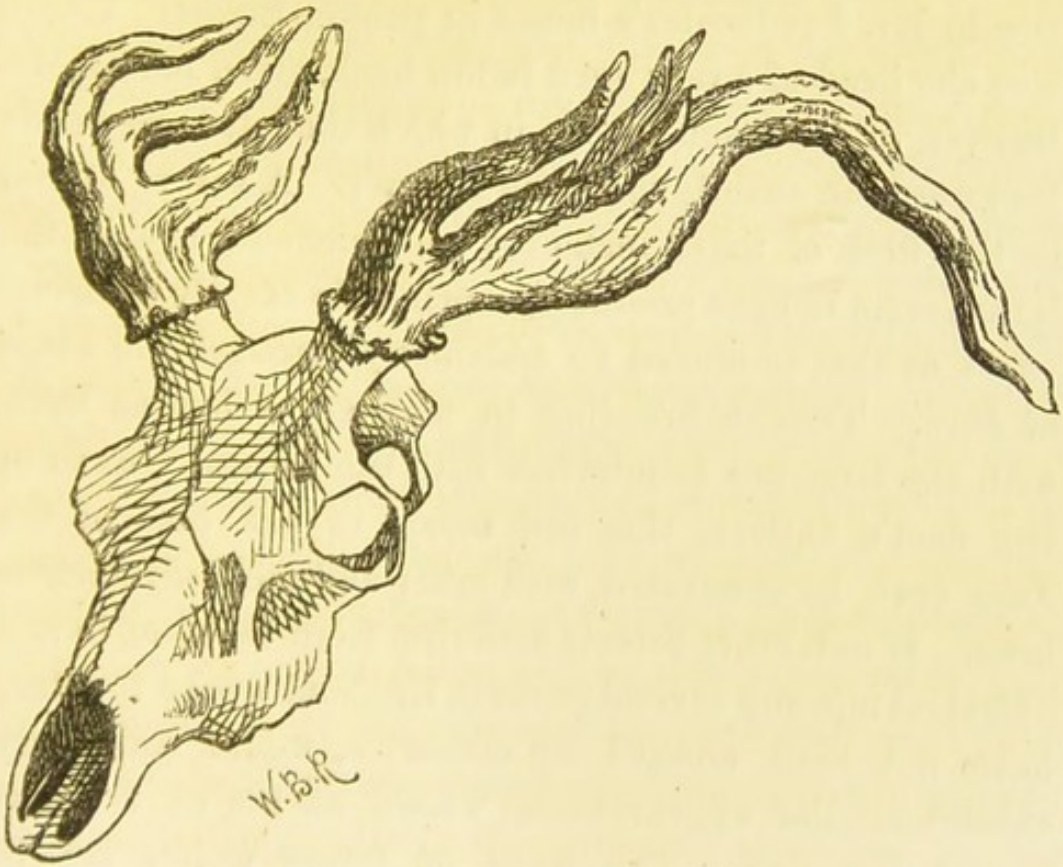
CROMMY ANTLERS FROM JURA.—No. 1.

longest measuring twenty-one inches. No. 2 is a more remarkable shape, having nine points, all short, with the exception of one, which measures twenty-two inches. I could give numbers of others equally curious, but perhaps these will sufficiently illustrate the crommy heads of Jura. It must not be supposed that there are no well formed

antlers in this forest, for as a rule it produces rather fine heads, crommies being the exceptions."

In the following number of *Land and Water*, Sir Victor Brooke writes :—

"The crommy heads of Jura are a most interesting example of the delicate adjustment of the laws which govern the growth of deers' antlers. Breeding in, and over-



CROMMY ANTLERS FROM JURA.—No. 2.

stocking, will be in all probability the main cause of this unnatural growth, so common in Jura; and their home being an island, any malformation proceeding from a general cause would sooner develop itself amongst the deer. The irregularity of the horns bending back over the neck seems to be not an unusual indication of something working unnaturally upon the constitution of a deer. I have

in my collection the head of a deer that I wounded very severely in 1866, and killed in 1867. He had a splendid head when I wounded and lost him, but when I killed him his horns were most extraordinary. The left horn is two inches and three quarters long, the right six inches; there are no brow antlers, and the horns, such as they are, bend backwards just like a crommy head from Jura, that I once saw in Mr. Leadbeater's house in Brewer Street. I have also the head of a very aged fallow buck, given me by Mr. Sawyer, of Richmond Park, in which the left horn bends backwards in exactly the same manner. A severe wound in the first of these instances (and extreme age in the latter) seem to have produced in principle exactly the same effect as that produced so constantly amongst the stags of Jura. Though breeding in may set a law at work with the tendency to interfere with the natural growth of the deer's antlers, this law must, in the case of the Jura deer, be connected with other and more mysterious laws. If not, other forests suffering from breeding in and overstocking, and several parks in England where the deer have not been crossed for centuries, would constantly exhibit similar appearances, which, as far as I know, is not the case. The force or forces which act in combination with that set working by breeding in are probably closely related to the influence which causes healthy antlers grown in a particular country, forest, or park, so closely to resemble the type of antler locally prevalent."

The hoofs of red deer are also subject to deformities. I have examined the hoof of a stag in Lord Lovat's collection. Each hoof was some five or six inches long, and they

crossed each other, almost forming a figure of eight. In this case the leg had been fractured by a gun-shot wound, and the bone had become so united as to shorten the leg and to keep the foot off the ground. The horny hoof continued to grow, not being worn away by friction against the ground. A very similar deformity takes place in the hoofs of the cattle which live in the Falkland Islands. Dr. Murie has described and figured a case in *Land and Water*. "Mr. Darwin," he writes, "in his 'Voyage of the Beagle,' in referring to the horses of the Falkland Islands, says :— 'From the softness of the ground their hoofs often grow irregularly to a great length, and this causes lameness.' Those that know anything about fillies are well aware that before they are shod, or travel much on hard ground, there is a tendency to overgrowth of the hoofs. In short, their hoofs, like our own nails, grow freely, and to a certain extent without stint, unless counteracted by ordinary mechanical agencies. The various wild donkeys and other equine tribes in the Regent's Park Gardens are all unshod, and it is notorious that their hoofs grow abnormally long, surpassing what ordinarily obtains in their fellow kind frequenting our hard English soil, and, similarly, those that are trimmed and shod. The menagerie donkeys, &c., therefore have their hoofs pared occasionally."

Another telling example of irregularity in the growth of hoofs is seen in our dairy cattle. Cows which are long confined in a dairy, without regular access to the green fields, or which travel on macadamised or paved roads, are subject to elongation and twisting of the hoof points. Sheep which are kept grazing for a lengthened period on low-

lying or marshy land, not unfrequently exhibit excessive enlargement of the hoofs, and they also occasionally overlap or curl about.

It not unfrequently happens that a pair of bucks, when fighting, manage to entangle or lock their horns so closely that they cannot be extricated without the aid of a saw. This is due to a certain amount of elasticity existing in the horn, which allows the tynes of the antlers to pass each other, when the horn immediately resumes its spring, and hence they become locked together. I saw a pair of horns of the reindeer similarly locked in Mr. Leadbeater's shop in Brewer Street; and there is, I believe, a specimen of two heads of the American deer (*Cervus Virginianus*) in the museum at Oxford; and instances have occurred with both the red and the fallow deer. There is, in the museum of the Royal College of Surgeons, a very fine pair of locked antlers of the elk or moose of North America, which were found on the skeletons of the poor animals. When thus entangled, they probably lingered out a slow and miserable death, or else they were speedily discovered and devoured by wolves. A portrait of these horns appeared in *Land and Water*, August 25, 1866; and a correspondent having seen them was good enough to send me the following interesting story:—"The illustration in *Land and Water* reminded me of an incident that occurred to me a few years since. One evening in the autumn of 1857, I was crossing the lawn with my dog Rover, bent on retrieving a wounded bird in the fern, when, through an opening in the latter, we suddenly espied two bucks in fierce conflict. In October these desperate encounters are almost of hourly

occurrence all over the park; and on a frosty, moonlight, night especially, the clash of horns, where there are upwards of a thousand head of deer, powerfully adds to the disconcerting character of their autumnal serenade, when a stranger to the economy of the fallow-deer happens to be one of the audience. The belligerents, however, will seldom allow any one, with or without a dog, to approach them within twenty yards, so that my surprise at seeing Rover run barking up to the desperadoes on this occasion without causing them to desist was sufficiently great to induce me to draw nearer to them myself. It then became evident to me that the horns were firmly locked together, and that the object nearest their hearts at that supreme moment was anything but mutual destruction. Their struggles to effect a separation were indescribably violent, and, as they alternately rolled over and over, and righted themselves again half-a-dozen times in a few minutes, it seemed marvellous to me that either of them should escape a dislocation of the vertebræ of the neck; but the great development of muscle which enables the buck to wield his horns so skilfully in battle would also seem to be an effectual provision against such a contingency. It would be difficult to convey an idea of the frantic energy displayed by the infuriated animals from the time Rover surprised them till, in their efforts to escape from him and from each other, they plunged headlong into the fern, which at that spot was more than six feet high, and rolling over again and again eventually became helplessly entangled, literally bound over to keep the peace towards each other by a process as stringent as any that was ever devised in a court of law.

"At this compulsory suspension of hostilities I could approach them without much danger to myself, and I then made a curious discovery. I found that the brow antlers of one of the bucks, instead of presenting the simple form of such appendages, had each in the course of its development assumed a sharp outward and backward curve near its extremity, forming a complete hook, and these having been forcibly wedged between the horns of the other had hooked on to them with a spring, and retained their hold so immovably that nothing short of a fracture could have loosened it.

"Taking a horn in each hand I tried with all my strength to break one or both, but finding that I could only bend them, I hastened to the cottage of the park-keeper, who, with his assistant, at once followed me to the "gory bed" of the prostrate heroes; and while he and his man held them firmly by their hind-legs, I sawed off one of the hooked antlers, and thus effected their liberation, as much perhaps to their surprise as to their satisfaction. This antler, which I have retained as a trophy, I have since had mounted as a desk seal."

I am a great advocate for crossing the breed of red deer; I several times mentioned to proprietors in Scotland the advisability of crossing the red deer with the wapiti of North America; and I fancy I made an impression in some quarters.

Some of my friends said it was impossible; I am not of that opinion. A gentleman who is much interested in the deer forests of Germany sent me facts to show that wapiti had been crossed with success with red deer:—

"The Prince Pless, who has large possessions in

Silesia, has succeeded in obtaining a cross between the wapiti (*Cervus Canadensis*) and the common red deer (*Cervus Elephas*). The breeding of the pure wapiti, which were first imported in 1862, appearing to be a failure, it was decided to try a cross with the native red deer, although zoologists had pronounced this to be an impossibility, or at least had predicted that the offspring would be sterile. Early in 1868 all the pure wapitis except one had died, and there remained twenty-eight head of half-breeds, of which three or four had been once, and others twice, crossed with pure wapiti.

"The half-bred deer is of colossal size, little inferior to wapiti in bulk and antlers. Its roar is less sonorous than that of the red deer. A four-year-old half-breed, twice crossed, carries antlers with fourteen points. In general appearance it resembles the red deer, *but is larger*."

I do so much wish some Scotch proprietors would try this experiment; I am sure it would answer, and greatly improve the heads of deer in their forests.

I have never yet been out deer-stalking—being much too busy with my inspection work—but I have been told many a tale of the difficulty there is in getting near enough to the deer to get a shot. I understand that one of the perilous moments of the stalk is when, having walked a long round to get at the corrie where the deer are lying, it becomes necessary to peep over a rock to have a look at the deer. On such occasions, the deer often take alarm, and I do not wonder, as a man's face peeping over a rock must necessarily be a new object for the deer, and it is impossible for a man to see unless his

eyes are above the level of the rock and at least half his face is exposed to the gaze of the animals.

The colour of the deer-stalker's cap under these circumstances becomes important, and I was much pleased to observe that the cloth cap worn by one of Mr. Tennant's deer-stalking gillies at Auchnashellach was made of a black and white material, exactly resembling a granite boulder, so that when this man's head was protruded above the rock, the deer might easily be pardoned (if the man remained quite still) for imagining the new object to be simply a real granite stone. The idea of assimilating the colour of the cap, and clothes as well, to the colour of the ground, struck me as a great dodge.

I think, however, I have hit upon an improvement, which I now throw out, more for fun than as a real practical suggestion. The head of a red deer, shot by H.R.H. the Prince of Wales, was kindly sent me by Mr. Tennant. I happened to be thinking of this gamekeeper's cap as I was skinning the head, and an idea suddenly struck me—why should I not make a deer-stalking cap of the deer's head itself? thought I—so I took all the skin off the skull, and with a surgical saw, carefully cut the skull in such a manner that the horns (which are by no means large) should remain *in situ*, while the loose skin hung all round it. I then put my head through the skin of the neck, pulling on this new-fashioned cap, made of the whole deer's head, skin, ears, horns and all, just as a diver puts on his diving helmet. The nose part I managed to stuff out into a natural position with cotton-wool and a spring of whalebone.

I then sent for a looking-glass, and arranged the holes

where the deer's eyes formerly were in such a manner that my own eyes came exactly in the place of the deer's eyes. I found with this arrangement that I had plenty of air to breathe, and could obtain an excellent view from between the deer's eyelids. With this deer's head on, I then ran upstairs, and frightened the whole household—monkeys and all—out of their wits.

It would not, therefore, I imagine, be a bad plan for the deer-stalker to carry one of "Buckland's Patent Deer-stalking Caps" with him. My cap, horns and all, weighs but very little, and when it is dry it will be lighter still. When it is necessary for him to look over the edge of a rock to examine what the deer are after, he can just put on the deer's-head cap. The horns of the deer would appear just above the edge of the rock, and then gradually the whole head of the deer, which head contains the head of the deer-stalker, who thus would be enabled to get an excellent view from his patent observatory. The deer *ought* not to be alarmed at seeing the head of a comrade, and the stalker's eye, moving and glistening inside the skin would add to the general appearance of the thing being alive. I say the deer *ought* not to be alarmed. The experiment anyhow is worth trying. There is, however, one danger that must not be overlooked. Some stalker might possibly be "stalking the stalker," and, mistaking his patent cap for a real deer's head, might take a shot at it, which would be "decidedly a bawr," as Lord Dundreary has it.

I must not in this chapter omit to mention a curious instance of a supposed hybrid between a cow and a red-deer which came under my notice. When inspecting the

river Beauly, near Inverness, Lord Lovat kindly asked me to examine a supposed hybrid between a red-deer stag and a cow, which was in the cow byres at Beaufort Castle. The animal was standing in a straw-yard. With its head turned away, it was like an ordinary black Scotch cow, but when she turned her head I was amazingly struck with the very deer-like appearance of the face, which the set-on of the ears, the oblong Chinese-like eyes, and the narrow prolongated muzzle, increased.

The story is that a cow was kept in a distant locality, where she could have access to none of her own species, but that there were red-deer stags about. A calf was unexpectedly born in which the deer features appeared. This calf has now grown up into the animal, as above described, which was then four years old. The herdsmen told me that the other cattle would never associate with it; and in fact, when he drove it into the cow-shed, in order to tie it up for me to examine, the other animals turned their heads, and snorted at it.

The voice is not like that of the other cattle; it is a short noise like "ump!" "ump!" The action when trotting is somewhat higher than that of an ordinary cow. There are no horns, but a bony knob of a somewhat triangular shape between the ears. Although the resemblance to the deer about the head is exceedingly remarkable, I cannot bring myself to believe that it is a true hybrid. When the animal was killed the head was sent to me, and I made a cast of it, preserving the deer-like features, in a way that no stuffing could have done.

I have rather come to the conclusion that it is a "Free Marten," or else a case of "mother marking."

It would appear that Free Martens are not uncommon among black cattle. Lord Lovat's beast is of the "black cattle" breed. John Hunter figures the "Free Marten" he anatomised. There is, however, not the least deer-like appearance about the face.

While writing on "mother marking," it occurs to me to ask whether any gentlemen who breed stock can account for the remarkable facts as detailed in the thirtieth chapter of Genesis:—"And Jacob took him rods of green poplar, and of the hazel and chesnut tree; and pilled white strakes in them, and made the white appear which was in the rods. And he set the rods which he had pilled before the flocks in the gutters in the watering-troughs when the flocks came to drink, that they should conceive when they came to drink. And the flocks conceived before the rods, and brought forth cattle ringstraked, speckled, and spotted. And it came to pass, whensoever the stronger cattle did conceive, that Jacob laid the rods before the eyes of the cattle in the gutters, that they might conceive among the rods. But when the cattle were feeble, he put them not in: so the feebler were Laban's, and the stronger Jacob's."

I confess I am quite at a loss for an interpretation. Were the facts as above recorded a miracle, or were they the results of natural physiological causes?

On this curious point, a long correspondence took place in *Land and Water*, whence the general conclusion seemed to be that Lord Lovat's strange animal was simply a case of "mother marking." "S. C." writes:—

"I remember an exhibition in London about twenty-five years ago, of a supposed hybrid between a New

Forest pony and a red-deer. The late Sir Benjamin Brodie told me he did not believe this to be a true hybrid, but thought it probable that the pony-mare had been much in the company of red-deer during gestation. (This was before the miserable cheese-paring policy of disafforesting, when the red-deer were still to be seen in the forest glades.) Hence the indication of a divided hoof and other resemblances, in both the head and tail, to the deer."

I do not think railways interfere much with red-deer. A grand advance has been made in making the railway which runs due west from Dingwall, thus bringing Skye into communication with big towns. I visited Mr. Tennant, of Leeds, who had a splendid shooting-lodge at Auchnashellach; his private railway station is in his garden. He is quite in the country, but yet in railway and telegraph communication with everywhere. People may say, "Oh! but there can be no good shooting here!" Quite the contrary, red-deer can be seen from the drawing-room windows, and there are lots of roebuck in the woods close by the house; and from the front door I saw two eagles high up in the air watching for blue hares. The deer-forest, within a quarter of a mile drive from the house, is well-stocked; in fact, I sat upon the railway bank and "spied" the beautiful creatures in Corryvannie, five miles distant from us. These are the very animals the Prince of Wales was shooting the following Wednesday. His Royal Highness, I understand, killed twenty-five stags, and "there were upwards of 500 deer in the ravine." This corrie, I have no hesitation in saying, was filled to the brim with vast blocks of ice during the

glacial period in Scotland—a scientific discovery in geology which my father was one of the first to bring before the public.

We hear the shrill whistle of the locomotive in the distance. "Stand by the horses" is the word, for the train will pass at full speed, in a minute or two, within a few yards of their heads, and on the same level. The engine-driver sees us as he comes round the sharp corner, and sounds his whistle loud and shrill. What a grand roll of echo comes back from the corrie and the mountain opposite! What other instrument of sound could produce the same effect but a railway whistle? It is worth the while of Scotch proprietors to "breed railway engines artificially," in order to make them scream and give effect when they give entertainments in their shooting-lodges. "Does not the railway whistle interfere with your deer-forest?" was my question to Mr. Tennant, after the train had gone by. "Not a bit of it," said he, "the deer soon get accustomed to the passing trains, and they don't mind them at all." Why should they? We have all of us seen sheep and cows staring quietly at the train as it passes at full speed through their enclosure, and why should not deer also get accustomed to the noise and rattle?

I understand, however, that railway wire fencing will sometimes cut off deer from their own forests, but I have heard from Lord Lovat that the deer go along by the wires until they find out the passage of the bridges, and then get over them. Railways therefore do *not*, as far as I hear, interfere with shooting; they open up properties, they encourage commerce, they bring capital and fresh blood into Scotland.

As regards the word "Forest," as applied to a place inhabited by red deer, I heard the following story :—

An inquisitive tourist was once taking a ride in the Glencoe coach. The coach went through the vast estates of the Earl of Breadalbane. The tourist kept continually asking the coachman "who owned the property?" When they first started he inquired, "Who owns this property?" The coachman growled out, "The Marquis." "Which Marquis?" said the tourist. "Bread-Al-Bane," was the answer. Ten more miles were passed. Again the same question, and the same answer, "The Marquis;" "which Marquis?" "Bread-Al-Bane," and so on, to the end of a very long day's journey. At one place the tourist asked "what they called yon hills?" "Eh, but that's just a deer-forest," said the coachman. "Deer-forest?" said Mr. Tourist; "but I see no trees." "Trees," said coachee; "but, man, wha *ever heard of trees in a forest?*" "But," said the tourist, "I can see no deer." Coachee lost his temper. "It's no to say that there are nae deer because the like of you canna see them."

In a true etymological sense I believe the coachman's definition of a "Forest" was right, for I find the following definition in a dictionary:—"FOREST, in geography, a huge wood; or, a large extent of ground covered with trees. The word is formed of the Latin *forefta*, which first occurs in the capitulars of Charlemagne, and which itself is derived from the German *frost*, signifying the same thing. Spelman derives it from the Latin *foris restat*, by reason forests are out of towns. Others derive *foresta* from *feris*, *q.d.*, *Foresta quod fit tuta statio ferarum*, as being a safe station or abode for wild beasts."

Scotch Wild Cats.

I am the possessor of two wild cats from Scotland. They can both be seen in a case at my museum. The first was sent me by Mr. Donald Cameron, of Lochiel, M.P. I had discovered the head of a wild cat nailed to the back of the kennel (in which were some splendid Scotch deerhounds), at Mr. Cameron's house, at Auchnacarry, Fort William, and he kindly ordered his keeper to send me the first wild cat caught on the estate. This wild cat was a female. She weighed eight and a quarter pounds, and measured two feet eleven inches in length; the length of stride (that is, with the legs stretched forwards and backwards) measured three feet five inches. Mr. Cameron tells me that this wild cat came down in the snow from the woods and killed two of his Rouen ducks. She was tracked in the snow and captured six days afterwards by setting traps round the undevoured portion of the ducks. One of her hind and one of her fore legs had been smashed by the trap, the bones protruding through the skin. The skull had been completely smashed, and the bones comminuted into many fragments.

The second cat was given me by Captain William Houstoun, of Kintradwell, near Golspie; this was also a female; she weighed seven and a half pounds, and measured two feet eleven inches, the length of stride being three feet four inches. Both these cats were of the ordinary colour of wild cats, *i.e.*, very much resembling the grey striped or ordinary tabby cat, only that the markings were very *prononcés*. The most ordinary observer

might see that the wild cat is a much more powerful and strongly-built animal than the common house cat: the tail is almost as bushy as a fox's brush, and ends in a black tuft, above which there are three or four black rings encircling the tail. Much has been said as to the tail being a diagnostic mark between the wild and tame cat. If the reader will observe a tame cat, he will find that the tail tapers considerably towards the point, whereas the tip of the tail in the wild cat very much resembles a badger's-hair shaving-brush when dry. This is certainly a marked feature in all the wild cats I ever saw. As regards this point, Professor Owen gives his opinion as follows:—"The tail of the domestic cat is more tapering and a little longer than in the wild cat; but the extent to which this part is shown, by a curious propagated variety of tailless cat, to be susceptible of modification, ought to warn us against inferring specific distinction from slight differences in the proportions of the tail."

Wild cats for the most part are found in Perthshire, Aberdeen, and Argyle. They are seldom, if ever, met with in bleak or exposed places; and they seem to like brakes or copses rather than forests of tall trees. They are more nocturnal than diurnal in their habits, and the structure of the eye at once indicates this. A friend of mine has a fine rug of wild cats' skins, collected in the neighbourhood of Newton Stewart, Wigtownshire; it had taken him eleven years to collect twelve skins. When the Highland meeting was going on at Inverness I observed several gentlemen wearing wild-cat sporrans. The price asked for a sporran of cats' skins at a shop was fifteen shillings; but the maker of this identical sporran, hung up in one of the

minor shops, had very foolishly so arranged the skin that the tip of the tail could easily be seen to be that of a *house* tabby cat, for which I thought fifteen shillings was rather a high price to pay. In other shops I saw some splendid sporrans of true wild cats' skins.

I have now before me a very beautiful print of wild cats and nest. It is by Reidinger. The mother is playing at the root of an old oak-tree, with three kittens, that look as fierce and savage as tiger cubs. The old Tom is evidently just come home from a hunting excursion, and is crouching down and snarling at another wild cat, which is just coming down a bough, and evidently an unwelcome visitor. The fellow's back is arched like a Chinese bridge, and he is evidently "swearing famously." The following is the inscription on the print:—"Die wilde Kaz oder Kuder wird im Alter sehr gros, haben 3 4 bis 6 jungen." "The wild cat when old becomes very large. It has three, four, to six kittens." This reminds me of the stupid butler, who announced in a drawing-room, "Mr. and Mrs. Cat and the Misses Kittens."

The wild cat's voice is said to be very peculiar. Mr. St. John writes:—"I have heard their wild and unearthly cry echo far in the quiet night, as they call to and answer each other. I do not know a more harsh and unpleasant cry than that of the wild cat, or one more likely to be the origin of superstitious fears in the mind of an ignorant Highlander."

My friend, Captain Houstoun, of Kintradwell, is a great authority on wild cats, and I now reproduce his remarks:—

"Writing from a country which still carries its Gaelic name of 'Chatt,' the crest of its noble proprietor being

a cat, and its *spécialité* of old being a peculiarly large and fierce breed of that same animal, I think it may interest naturalists to know that to this day there is, perhaps, no district in the Highlands where the breed exists in greater purity or perfection.

"Tradition has it, that once upon a time Sutherland was invaded by a hostile band, and that upon landing they were opposed by an advanced guard of furious wild cats, and so well did the latter defend the coast that the enemy skedaddled without coming to the scratch! This is, perhaps, not so much to be wondered at when we consider the very scanty 'garb of old Gaul' of the period, and we can fancy that in those times if prizes were given, as now, for the 'best dressed Highlander at his own expense, the judges must have had an arduous duty to perform!

"May there not, however, be some foundation for such a tradition, if we must allow that beasts of prey, as well as cattle and deer, have deteriorated so much in size and vigour in latter days? Take, for instance, the large and magnificent heads of the ox and stag, so frequently dug up in our peat bogs, mud and marl pits, and compare them with those of the present day; in like proportion would it be too much to imagine the Highland wild cat of olden time prowling about in size equal to the lynx or panther of our day?

"The breed of real wild cats is, I am sorry to say, in many districts extinct, and is getting more scarce every year in this county. Civilization in general, and keepers' traps and terriers in particular, will ultimately finish the race.

"Nevertheless, a goodly remnant will be left for future lovers of natural history, as long as the fine old deer-forests are kept up.

"It has frequently struck me that the distinguishing features of the wild and tame cat, as laid down by naturalists, have been trifling and indefinite, the principal difference being in the shape and length of the tail.

"This is, as far as my experience goes, not to be depended on, although as a general rule the tail of the wild animal does not taper, as in the tame, but carries the same length of fur to the tip, which gives it a stumpy appearance. But the length of the tail varies so extremely in different specimens, that it would almost lead one to suppose that there may be two sorts of wild cat—the short and long tailed. The head of the wild cat always seems larger and rounder in proportion to the body than that of the tame. This appearance may, however, be deceptive, as the body has always, in the wild species, a peculiarly lean and lanky look, notwithstanding the goodly lining of fat which generally adheres to the skin.

"But there is one most striking difference which I must mention, although it may not be new to many naturalists—I mean the great difference in the length of the intestines of the wild and tame species. In two very fine specimens of the wild cat, over four feet in length, captured last winter, and which now hang in my gun-room, I found the intestines of each, taking in the small and empty stomach, to measure only five feet, whereas any common house cat would probably be found to carry three times the above length. I should like to know the ex-

perience of naturalists on this point. Do the intestines lengthen in the tame animal, as their duties become more various and arduous?

"The way in which my two wild cats, male and female, were caught, may throw some light on their mode of living. An otter had taken a fancy to some pet trout placed in a small pond for experiment, and added insult to injury by killing more than he could eat, and leaving the fish untouched on the bank. So, to stop his little game, traps were set on the edge of a small brook down which he was in the habit of coming to his supper. In one of these traps both cats were taken on consecutive nights, suggesting the idea that they had been in the habit of following their amphibious neighbour and coming in for the reversion of the epicure's meal. This may also account for the fact that one seldom finds portions of half-devoured fish so frequently left by otters in localities where wild cats exist. I would notice one other peculiarity which has always struck me in the wild cat as differing from the tame. I mean the strange manner in which when bolted from a cairn, or disturbed from its bed among the heather, it gallops off in a series of bounds, carrying its big bushy tail vertically, and giving it a wavy motion which looks strangely awkward.

"Judging by the lanky appearance of the Highland wild cat, one would infer that it does not fare sumptuously every day, but that, saving where game is very abundant, it has to work hard for sustenance. I have frequently followed its track on snow for from ten to twelve miles, over ground which it had hunted during the previous night; and it is then that its tactics in stalking its prey can best

be seen. Although not above digging up a half-frozen mouse *en passant*, grouse seem to be its chief food at such times, and as the latter scrape holes in the snow for shelter, and to get at the heather tops, they become the easier prey. Nature having denied the cat the white winter coat which some of its relatives put on, it is placed at sad disadvantage in stalking over white ground, and many a failure to circumvent the wide-awake hare is the result.

"With birds lying under the surface, however, it is very different, and when the cat by its quick sense of smell becomes aware of their proximity, a deep furrow can be seen in the snow, where it has pulled itself along, so as not to be seen; and the mark of a gathering for the fatal spring of six or eight feet, and some blood and feathers where the grouse lay, tell the rest.

"Unless caught when very young, I believe the wild cat to be quite untameable, and when captured full grown it will often die of starvation, refusing to touch the most tempting food. This I had a good instance of, not long ago—for having caught a fine large male specimen by one of its claws, which was only slightly bruised, I had him taken home in a sack and put into a comfortable box with iron bars in front, so as to be able to watch his movements. This, by the way, was no easy business, for he fought like a devil, tooth and nail, and sprang at the bars of his cage with dreadful fury when anyone approached. When left alone, his first duty was to examine his injured foot, which he soon licked into a mending state; and, coiling himself up in the corner of his den, he lay ready to spring forward at the slightest noise or intrusion.

But nothing would entice him to eat, although the most tempting food, alive and dead, was left in the cage; and after his starving for a fortnight, at the end of which time he was as fierce as ever, I could stand the sufferings of the plucky fellow no longer, and put an end to them.

"Let us hope that game preservers and keepers may deal leniently with this fine animal, now becoming so scarce, and that Sutherlandshire in particular may never want some living representatives of the crest of its noble house."

Subsequently Captain Houstoun wrote:—"I have to announce the capture of a wild cat, not *dead* this time; but alive, and at present in famous *health* and *spirits*. She was taken in a trap set for a fox (we are all professed *vulpicides* here), and the claws of the right fore-foot, being a great deal crushed, have sloughed away; but the wound has healed up kindly. From having failed in getting a wild cat to feed in captivity, I had great fears in this latter case of a similar result; and more especially so, as for the first few days she would not touch food. However, she most sensibly saw the folly of her obstinacy, and one night, to my great delight, she commenced operations by devouring the best part of a rabbit, crunching up bones and all. I have now had her about six weeks, and she thrives well, supping on a rabbit, rook, or pigeon every night. Her habits are entirely nocturnal; and during the day, if not disturbed, she *moons* and dozes in the sun like the most refined tabby, her domestic economy being quite as methodical. She is a bit of an epicure in her way, and her predilections are almost human. Hare, rabbit, rook, or pigeon she delights in;

rats or mice are only eaten under starvation pressure, and grey crow or gull she will not touch under any circumstances. Notwithstanding all the comfort, so new to her, of *peace* and *plenty*, her temper has all along been simply *diabolical*, and does not seem to improve much with acquaintance. She looks so viciously intelligent, that I cannot help sometimes treating her to a lecture on *ingratitude*, which she receives with growls and spitting; and her aim in life seems to be to 'lacerate the hand which feeds her.' Twice only has she been seen to relax into a jolly mood, and then she scampered through her cage, playful as a kitten; but upon seeing she was watched, her sudden transition from gay to grave was more than ludicrous.

"There seems to be great room for doubt as to the wild and tame breeds being identical. Animals when domesticated have, I believe, invariably increased in size, but this is very far from the case with the cat; and a number of differences, in external appearance, all tend to separate the breeds. The specimen I now possess, when enraged, buries the ears quite out of sight in the fur of the scalp; and to the credit of heraldry be it said, the *cat rampant* attitude is perfectly natural to the wild cat, when on defence or at bay."

In Sutherlandshire the sign of the wild cat is common in public-houses. His Grace the Duke of Sutherland is head of Clan Chattan, or the "Clan of the Cats."* His Grace was good enough to show me the silver brooch that he wears in his bonnet. It represents the head of a

* A correspondent writes—"This honour is claimed by both Cluny Macpherson and MacIntosh of MacIntosh."

cat, and is mounted with two wild cats' teeth, one of which was found in an ancient Pictish tomb. In the village of Golspie, close to the Duke of Sutherland's noble castle, Dunrobin, the sign of the public-house is a wild cat. If I recollect aright, the cat is represented as sitting, though I believe the cats on these signs are in different positions in different parts of the country.

At a little roadside inn below the falls of the Spean, some fifteen miles from Fort William, at Roybridge, where we stopped to lunch, I again found the sign of the cat. Two cats stand *rampant*, supporting a coat of arms, and a little cat is represented above the coat of arms. Upon one quarter of the shield there is a figure of an ancient galley, indicating that the bearer of the arms had a right to port-dues upon ships. There is also, in another quartering, the figure of an arm, with a glove on it. The motto is,

"Touch not the cat but a glove."

The landlord told me that these were the arms of the MacIntosh family.

I understand that the Scotch word "BUT" means "without," and consequently the motto warns against meddling with the MacIntosh, unless prepared to meet the consequences. The motto is referred to under the word "BUT" in Jamieson's "Scottish Dictionary."

At the first Cat show held at the Crystal Palace, in July, 1871, the Duke of Sutherland exhibited a splendid wild cat, which had been caught by Captain Houstoun. He was first sent to my house in Albany Street, but the beast was so fierce that there would have been a "mutiny at the

Nore," both of bipeds and quadrupeds, if I had taken him as a guest, so I was unwillingly obliged to pass him on in a cab up to my friend Mr. Bartlett, at the Zoological Gardens, who put him in excellent condition for the show. This wild Scotch cat won a prize of £1 10*s*. I think the poor thing should have a silver collar made of this value; only who will "bell (or rather collar) the cat"? At the show he looked very bitter and snarly; he kept his ears flat down, and every now and then smiled a ghastly grin and showed his white teeth, with a hissing "kuss, kuss," as much as to say, "Let me out of this cage, but for a minute, you wretched Londoners, and I make the lot of you skedaddle. I am a prisoner now, but I've got good old Scotch blood in my veins, and I would make the bundle of you clear out like frightened sheep, like my ancestors did the Picts, hundreds of years ago." I went behind the bar to examine him more closely, and called him "Puss, puss, puss." I fancied the poor brute smiled, and I fancied also I heard him whisper, "Mr. Buckland, Dear sir, I owe to you this *delightful* afternoon in the Crystal Palace in a cage, instead of spending it, in a hollow tree, in the far north with my wife and dear kittens. 'Kuss,' 'kuss' you; but never mind, you are a good sort of a fellow. I suppose *mourir pour la patrie* is the correct thing. Do pray ask the Duke to give his gamekeepers orders not to kill down my friends and relations quite so hard; for we do him more practical service than he thinks; and if we do *some* mischief there will be plenty of grouse left for the guns on the 12th; and we would all of us rather be shot and 'die game,' at the hands of a sportsman with a breechloader, than be ignominiously trapped, and have our

poor legs snapped in half by the cruel iron teeth of a gin, set for us when we are nearly starved; or even let the gentlemen come out and hunt us with terriers and sticks, and we will show some sport. Do, sir, please ask the Duke to preserve us poor wild cats. Our next door neighbours, in the —— Craig—the eagles—told me before I was fool enough to be caught, that the Duke protected them; so perhaps, if you will kindly tell the Duke what I ask you, this charming (oh, how hot it is!) visit to the Crystal Palace may be of use to us poor Scotch wild cats."

The *Chasse Illustrée* says:—"There are many wild cats in the mountains between Spain and France, where they are hunted in October and November, when a great procession of sportsmen starts in state from Pampeluna. The peasants put down baits fastened with wire, in localities frequented by the cats. The beaters then beat for the cats, which are shot when in the trees. At the end of the day, the dead cats are hung up in a cart, covered with garlands, and a triumphal entry formed into the town. A dinner then takes place, and they sit down (mayor and all) to *eat the cats*. We are informed 'that the flesh of the wild cat is exquisite, in the opinion of every gourmand that has eaten it. It is white, like the flesh of the rabbit, but more delicate, and of a much finer flavour. It is not good roasted, so the cooks serve it *très friands*.'

"The price of a hare in the market is three francs; a wild cat, fit for the table, is worth six to seven francs. The fur is very fashionable among the ladies at Madrid. The kings of Aragon used it as a royal fur for coronation and ceremonial robes. Parchment was also made of the skin of wild cats. It is called 'Felin.' It was only

used for Acts of Parliament and ordinances of the king of the highest importance. In the town-hall of Navarre is a valuable registry, dated 1481, written on 'Peau de Felin.' On this, charters of the utmost public importance are transcribed, and each page is certified as being true cat's skin. There are no less than 2,500 leaves."

Wild Cattle from Hamilton Palace.

When officially engaged in September, 1871, inspecting the River Clyde above Glasgow, I had the pleasure of being introduced to Mr. Stewart S. Robertson, Chamberlain to His Grace the Duke of Hamilton. I asked Mr. Robertson to be kind enough to procure for me a head of one of the celebrated breed of wild cattle (*Bos Scotticus*), which still roam through the magnificent park round His Grace's palace in Lanarkshire. In due time the head arrived; and it has been admirably set up by Mr. Edon, and is now in my museum. The head is that of a fine specimen of this now rare species of cattle. The colour is a milk white; the muzzle (all round) being an ink black. The ears are black inside and out. The horns measure, from tip to tip, 13 in., and resemble the horns of an ordinary cow. The tip of one horn is, unfortunately, broken off. The measurements are from crest of forehead to nose 1 ft. 6½ in., across forehead 10 in.

There are, I believe, only two places in Britain where these wild cattle now exist, viz., at Hamilton Palace in Lanarkshire, and at Chillingham Park in Northumberland. Some years since Lord Tankerville was kind enough to show me his herd at Chillingham. We did not see much of

the cattle themselves, but we found a calf among the ferns, and were about to examine him when we saw and heard the mother coming, and beat a most precipitate retreat.

This *Bos Scotticus* may, I believe, be considered to be a genuine wild animal still existing in the midst of civilisation.

In the "Naturalist's Cabinet," 1806, I find the following paragraph :—"The cows of this species, at the time of parturition, seek out some sequestered retreat, where they conceal their young for a week or ten days, occasionally going to suckle them. The calves, if approached by any one, clap their heads close to the ground and lie like a hare in order to hide themselves. This seems a proof of their native wildness, and is corroborated by the followlowing circumstance related by Dr. Fuller, author of the 'History of Berwick.' He found a hidden calf about two days old, very lean and weak, but on his stroking its head it got up, pawed two or three times like an old bull, bellowed very loud, retreated a few steps, and bolted at his legs with all its force; it then began to paw again, bellowed, stepped back, and bolted as before; but, being aware of its intention, he moved aside and it missed its aim and fell, and was so very weak that, though it made several efforts, it was unable to rise. The noise it had made, however, had alarmed the whole herd, and our author was compelled to retire.

"It has been remarked that when an individual of this species happens to be wounded, or is grown weak and feeble through age or sickness, the rest of the herd set upon it and gore it to death."

Not having been able to spare time to examine the

Hamilton breed of cattle, I am compelled to give what information I can from sources already published. In Sir William Jardine's "Naturalist's Library," vol. iv., 1836, is an admirable account of *Bos Scotticus*. Sir William seems to have been very much in the same position, as regards information, as I now find myself; but he had the advantage of receiving a special paper upon the wild cattle, by Mr. Robert Browne, a predecessor of my friend Mr. Stewart Robertson in the office of Chamberlain to the Duke. I now will give an abstract of this valuable paper.

These white cattle are believed to be the remains of the ancient breed of white cattle which existed when the Romans inhabited the country. Some of the oaks in the park (which is upwards of 1300 Scotch acres) are supposed to have been planted by King David, about A.D. 1140. In general habits the wild cattle resemble the fallow deer more than any other domestic animal. Great care is taken that they shall not cross with the ordinary cattle of the country. When feeding, they do not scatter themselves like tame cows, but feed in a herd. They have great power of smell, and do not like to be approached by strangers. When these animals perceive any one approaching them, they set off in full gallop, and, at the distance of two or three hundred yards, wheel round and come boldly up again, tossing their heads in a menacing manner. They then stop suddenly at the distance of forty or fifty yards, and look wildly at the object of their surprise; but on the least motion they all turn round and gallop off again with equal speed, but to a shorter distance; forming a smaller circle, and again returning

with a more threatening aspect than before, they approach much nearer, probably within thirty yards, when they make another stand, and again gallop off. This they repeat several times, shortening their distance and advancing nearer, till they come within a few yards, when it is advisable to leave them, as in a few turns more they would probably make an attack.

The ancient mode of killing these animals was very singular. On notice being given that a wild bull would be killed on a certain day, the inhabitants of the neighbourhood assembled, sometimes to the number of a hundred horsemen and four or five hundred foot, all armed with guns or other weapons. Those on foot stood upon the walls, or got into trees, while the horsemen drove a bull from the rest of the herd until he stood at bay, when they dismounted and fired. Sometimes, on these occasions, twenty or thirty shots have been fired before the animal was subdued; in which case the bleeding victim grew desperately furious from the smarting of his wounds, and the shouts of savage exultation echoing from every side. But from the numerous accidents which happened, this dangerous practice has been disused of late years, the park-keeper generally killing the animal with a rifle at one shot.

The Hamilton breed differs from the Chillingham breed. In the latter the colour is invariably white, the muzzle black, the whole of the inside of the ear and about one-third of the outside from the tip downwards, red. In the Hamilton *Urus* the body is dun-white; the inside of the ears and the muzzle, black, and the fore part of the leg, from the knee downwards, mottled with black; the roof of the

mouth and the tongue are black. The size of the smaller Hamilton cows does not exceed fifteen stone; but some of the larger bulls average from thirty-five to forty-five stone. The Roman historians talk much of the furious wild bulls which the forests of Caledonia brought forth.

In those early days they are represented as possessing *jubam densam ac demissam instar leonis.* The universal tradition in Clydesdale is that they have been at Cadzow from the remotest antiquity; and the probability is that they are a remnant of the establishment of our ancient British and Scottish kings.

The other parks where this breed was once kept up were at Wallaton in Northamptonshire, Gisburne in Craven, Yorkshire, Limehall in Cheshire, Chertley in Staffordshire, Burton Constable, in Yorkshire, and Drumlanrig, in Dumfriesshire. At all these places they have worn out, or have been destroyed by neglect, disease, or some other means; for we possess no very recent information regarding them in other parks except at Chillingham and Hamilton.

I do not quite understand how it is that these wild Scotch cattle became enclosed in parks, unless it is to be accounted for by the fact that in the ancient border marauding expeditions they became the chief objects of attack, and were consequently enclosed to prevent their straying into the woods and open places.

As regards the relation of *Bos Primigenius* to *Bos Scoticus*, Professor Owen writes:—"In the manuscript catalogue of the British Museum, this fine specimen is ascribed to 'the Caledonian ox, *Bos Taurus*, var. *gigantea*.' But the wild white variety with black muzzles, ears, and horns, the *Boves sylvestres* of Leslie, which are identical with the cattle

preserved at Chillingham, are of very inferior dimensions, and differ particularly in the smaller proportional size, and finer and more tapering figure of the horns. The kyloes of the mountainous regions of Scotland, which are more likely to have been derived from an indigenous wild race than the cattle of the Lowlands, differ still more from the *Bos Primigenius* than does the Chillingham breed in their diminutive size, and very short horns."

He then gives the following interesting passage :—

"It is remarkable that the two kinds of great wild oxen recorded in the 'Niebelungen Lied,' of the 12th century, as having been slain with other beasts of chase in the great hunt of the forest of Worms, are mentioned under the same names which they received from the Romans :

'Dar nach schluch er schiere, einen *Wisent* und einen Elch,
Starcher *Ure* vier, und einen grimmen Schelch.'

'After this he straightway slew a *Bison* and an Elk,
Of the strong *Uri* four, and a single fierce Schelch.'

"The image of the great Urus in the full vigour of life is powerfully depicted in a later poem, destined, perhaps, to be as immortal as the 'Niebelungen' :—

'Mightiest of all the beasts of chase
That roam in woody Caledon,
Crushing the forest in his race,
The Mountain Bull comes thundering on.'

"But the following stanza shows that Scott drew his picture from the Chillingham wild cattle :—

'Fierce, on the hunter's quiver'd hand
He rolls his eye of swarthy glow ;
Spurns, with black hoofs and horns, the sand,
And tosses high his mane of snow.'

—Scott, '*Ballad of Cadgow Castle.*'"

May we hope that the wild cattle of Chillingham and Hamilton will long survive. Beautiful as they are in themselves, they are still left to us as representatives of a race of the aboriginal cattle of this favoured land.

The son of my friend Mr. Bartlett, of the Zoological Gardens, having been commissioned to prepare, for the Moscow Exhibition, skins and skeletons of various breeds of English cattle, applied in 1872 to Lord Tankerville for a specimen of one of his cattle, a request which his lordship kindly granted. As these animals are very shy, the keeper and Mr. Bartlett concealed themselves among the hay, in a hay waggon, to the approach of which they were accustomed. The keeper was thus enabled to get close up to the herd, and one of the finest bulls was brought down with the rifle. Mr. Bartlett succeeded in making a splendid preparation of it for the Moscow Exhibition.

Golden Eagle from Sutherlandshire.

His Grace the Duke of Sutherland has formed an excellent museum at Dunrobin Castle. The museum, situated in the pleasure-grounds near the castle, is admirably fitted up, and contains a most interesting collection. The antiquities, especially the Pictish relics, are well worthy of notice, but to the naturalist the collection of birds is of the highest interest. In the museum we find specimens of nearly all the native *avi-fauna* in Scotland. Some of them, I am sorry to say, are fast disappearing before the gun and the trap of those horrid creatures, the gamekeepers.

Among the native Scottish birds, the eagle is by far the most noble; and I am very sorry to say eagles are getting scarce. It is, therefore, with the greatest gratification that I acknowledge, with many thanks, the receipt of an exceedingly handsome specimen of the golden eagle, from my friend Captain Houstoun. This bird is indeed a noble creature. It has been admirably set up by Mr. M'Leay, of 80, Church Street, Inverness. The bird is represented as sitting on the top of a rock, with his wings slightly expanded. His head and brilliant eyes are in the attitude of looking out, expecting the approach of an insidious enemy. The whole attitude of the bird admirably realises the following graphic passage in Mr. St. John's "Highland Sports:"—

"How picturesque he looks, and how perfectly he represents the *genus loci* as, perched on some rocky point or withered tree, he sits unconcerned in wind and storm, motionless and statue-like, with his keen, stern eye, however, intently following every movement of the shepherd or the sportsman, who, deceived by his apparent disregard, attempts to creep within rifle-shot. Long before he can reckon on reaching so far with his bullet the bird launches himself into the air, and, gradually sweeping upwards, wheels high out of shot, leaving his enemy disappointed and vexed at having crept in vain through bog and over rock in expectation of carrying home so glorious a trophy of his skill."

The measurements of this grand bird are as follows:— Length from tip of beak to end of tail, 35 in.; from the rock upon which he is sitting to top of head, 20 in.;

width of partially expanded tail, 15 in.; length of wing (as nearly closed) from shoulder to end of flight feathers, 24 in. He is now in my museum at South Kensington.

The plumage is in perfection, and still retains traces of the lovely metallic colour so noticeable in a living specimen. When alive it would have formed a good study for the great Landseer, and it is almost a *fac simile* of the eagle as represented in that most glorious picture by our friend Wolff, now in the ante-hall of Dunrobin Castle. In this beautiful picture the eagle is represented as sitting on the very highest peak of a granite mountain in the midst of a terrific snowstorm. The snow-flakes are whirled past the bird by a cutting gale of wind. Apparently a sudden gust in the storm has just taken place, for a few of the eagle's feathers are slightly ruffled, and a snow-flake or two have settled on his back, while the bird looks round with an air of scorn and indignation, as though he defied the wind and the Storm-King to frighten him, much less make him stir from his mountain home —the position he had chosen from which to witness the battle of the elements.

The eagle is admirably adapted to perform the duties assigned to him. The anatomy of the eye of the eagle is in itself a study, and this wonderful organ has a power of vision, of which we men have not the slightest idea, even though our sight might be aided by a telescope.

The brain is large and well developed, the convolutions of grey matter dipped deep down into the white matter, thus showing a considerable amount of intelligence in the bird. The optic nerve is large, the coats of the eye

strong and horny, but not so strong as the eyeballs of sharks and deep-water fish, which require a very tough coat (sclerotic) to the eye to stand the pressure of the water. The lens of the eagle's eye is very peculiar; it is flattened on each side and as brilliant as a diamond. A fish's lens is round. The eagle has, I believe, a muscular apparatus connected with his eye, by means of which he can convert it, as it were, into a telescope for seeing long distances, and he can so adapt his powers of vision as to see clearly at shorter distances. An eagle must have the most perfect organs of sight of any created thing. When he is soaring so high in the air that he can hardly be seen by the human eye, it is said the noble bird can see a hare or a lamb on the ground. I do not know of any good case where the sight of an eagle has been tested by experiment. The poor things are so hunted and persecuted, and the gun-bearing people are so anxious to destroy them, that they have no time or thought for experiment.

I never but once saw eagles flying. When staying at the house of my friend Mr. Tennant, at Dingwall, two eagles passed over the wonderfully beautiful valley of the Etive at early morning. The birds were at such a terrific height that they did not appear larger than swallows. They were evidently hunting in couples, as they whirled round and round in the most graceful circles, apparently describing a series of figures of eight. Their motion in flying was elegance itself, and it was very marvellous to observe how one slight flap of the wing served to carry them on for many minutes without the slightest further exertion on their part.

It is in the bones of the eagle that we find a most perfect mechanism for flying. The wing-bone is a perfect hollow, and made of the lightest possible material. The left humerus of a large eagle weighed only one ounce, and is almost transparent. With much difficulty I made a section of it with a fine surgical saw. I find the inside of the bone composed of the most lovely honey-comb structure, and little pillars of bone are thrown across from side to side throughout nearly its whole extent. The object of this beautiful mechanism is, probably, to distribute the power of the wing-muscles when in the act of flying. Towards the upper end of the bone there is a good-sized hole. This hole is placed there in order to admit air, and, though I believe the fact is disputed by some, yet I believe that the wing-bones of the eagle and other birds are connected with the lungs, so that the bird can fill his skeleton with warm air when he wants to fly, and thus become an animated balloon. As I hinted before, there is no trace whatever of marrow in the wing-bone, and that is the chief reason why we men will never be able to make wings and fly in the air. We have marrow in our arm-bones, and we cannot fill them with air; an eagle can, and that's the difference. I do not believe in Dædalus if he was made like other people. The thigh-bones of the eagle are also marrowless and quite hollow. They are composed, like the wings, of bone not much thicker than a single sheet of note-paper, but the bone, though thin, is as strong as the steel of a steel-pen before it is tempered in the fire. Let us look a little further, and we find that the leg-bones immediately below the hip-bones are quite full of marrow, and that the structure of the bone

itself is much firmer. The reason for this is that hollow bones would not do for the work to be done here. All the great muscles which work the tremendously powerful claws are connected with these bones, and here mechanics require strength, and firm pillars of bone, to form attachments for the claw muscles. The ribs and neck, pelvis and other bones of the skeleton, are also made of the lightest possible material; altogether, the mechanism of the eagle for flying, both external and internal, is an excellent example of beauty and design.

The great power of the eagle is concentrated in the hind claw. If the reader will crook his thumb forwards, and partially contract his fingers backwards, he will have a general idea of the conformation of this wonderful seizing weapon of offence. When the eagle strikes his prey he does so *from above;* charging downwards with immense velocity, he drives his hind claw into the body of his victim. In my specimen this talon in the end of the hind toe measures two inches; the toe itself measures about one inch, and the point is as sharp as a needle. This formidable weapon would drive the body of the prey seized directly into the grasp of the three talons which form the front of the foot. The innermost talon is the longest, measuring two inches and a quarter; the outermost talon is the shortest, measuring one inch. Thus we have a grasping machine combining the essentials of strength and lightness. Nobody better knows than myself what may be the effects of this terrible weapon. When at Oxford I had a tame eagle, which I kept at the back of my rooms in Fells Buildings. One day I had a row with the eagle about something or other—I

think it was about a dead cat—and, pouncing down from the bough where he was kept, the rascal fastened both his claws into the front part of my right thigh, causing the blood to flow copiously, and, at the moment, giving intense pain ; the claws had to be taken out one by one, beginning with the hind claw, and I ordered a broomstick to be put within the grasp of the bird, and he clutched hold of the broomstick with the tenacity of a vice. I did not want to spoil my bird by cutting his claws, but nevertheless I punished him by putting wine corks on to his talons, and I made him do penance in them for a week.

I really wish Scotch gentlemen would preserve their eagles more than they do. I believe they feed principally on blue hares, and surely there are plenty of blue hares —enough to spare a few for the poor eagles. Again, eagles are said to be foes to the grouse ; they probably do kill the grouse when they can get them, but it must be recollected that the eagles would catch diseased and sickly birds, and thus go far to stamp out the grouse disease. By destroying the eagles, therefore, I cannot help thinking that the Scotch proprietors are acting unwisely, for surely the fee of a few grouse and hares is not too great a payment to the eagle for the good he otherwise brings about by his gratuitous exertions.

In November, 1873, I bought from Mr. Ware, poulterer, of Albany Street, a cinereous, or Sea Eagle. He was a young bird, in most splendid plumage ; his weight nearly ten pounds, his length 3 feet $2\frac{3}{4}$ inches ; his wings when fully extended covered the space of 7 feet $9\frac{1}{2}$ inches from tip to tip ; his feet were of a most beautiful yellow, and claws ebony black. I understand that this magni-

ficent bird came from Norway. I saw no trace of blood about the feathers, but found some shots about the heart; from the fact that there was some wool in the stomach, it was evident he had been eating a sheep.

The skin of this eagle has been well set up by Mr. Edon in a flying position; the wings extended, and the head slightly bent downwards as though in search of his dinner. It is a great addition to my museum.

I have several times during my official inspections observed roadside public-houses bearing the sign of the "Eagle and Child." I especially recollect one sign most marvellously designed and painted on a public-house near Kendal.

Not knowing the origin of this story, and wishing to obtain information about babies being carried off by eagles, I put a query in *Land and Water*, and got the following replies:—

"Eagle and Child. — Under this heading in your last, you say that you will be glad if any of your correspondents would inform you if they have ever known an authentic case of a baby child having ever been carried off by an eagle, and if not, if they would inform you of the origin of the story in any ancient legend. The best written and best known story in Scotland, is that written by the late Professor Wilson, which I enclose. Another, in verse, by Samuel Rogers, is also very well known, a copy of which I enclose also. Similar stories are told of eagles in America, Switzerland, &c., and even here, in the far north, the thing is believed to have happened more than once. I am glad to say, in Orkney, eagles are strictly preserved by the land-owner of the only island in which they now

breed, viz., Hoy. 'Many stories'—I quote from the 'Natural History of Orkney'—are told of the great strength of the eagle. Wallace mentions a well-authenticated case of one John Hay, who, when a child, was carried off by one of these birds. There is at present a woman living in the Island of Graemsay, who goes by the name of the 'Erne,' from a tradition that her grandmother, when an infant, had nearly likewise fallen a victim to their voracity.—W. R."

"I beg to inform you that the said sign is common in Lancashire, about St. Helen's, Prescot, Knowsley, &c. When residing there I inquired as to its meaning and origin, with the following result:—Many years ago a certain Lord Derby and his lady were childless, and walking out one day (in what locality unknown) they discovered a child in an eagle's nest, and rescued and adopted it. Tradition hinted that his lordship knew more of the child than he was willing to admit, and that it was placed in the nest by human hands, rather than by the claws of an eagle, in order to excite her ladyship's sympathy.—J. H."

"I would remind you of the well-known crest of Lord Derby, viz.:—'On a chapeau, gules, an eagle, wings endorsed, or, feeding an infant in its nest, proper, swaddled, azure, banded of the third.' This crest was, I believe, derived from the family of Latham, and Burke records that 'In an old visitation of the county of Lancashire, in the College of Arms, it is stated, that a child was found in an eagle's nest upon the estate, and adopted by one of the Lathams; and this, it is assumed, was the origin of the crest.' In Cassell's 'Popular

Natural History,' and in Knight's 'Museum of Animated Nature,' anecdotes are related of eagles carrying away children; amongst the authorities given are Anderson's 'History of Ireland,' and Sir Robert Sibbald's 'Account of the Orkneys. — ALFRED H. PECHELL. (Barton-on-Humber.)"

"I often heard an uncle of mine, who married a niece of one of the Earls of Derby, allude to the origin on the Derby crest (an eagle preying upon a child in its cradle), and if Mr. Buckland will inquire in the College of Arms, of Lancashire, he will find it recorded that a child was found in an eagle's nest on the estate of the Lathams of Latham, an old Lancashire family, who are now represented by the Stanleys — Sir John Stanley having in (I think) 1385 married the daughter and heiress of Latham. Hence the crest of the present Earl of Derby.—HELEN E. WATNEY."

The above witnesses, to whom I am much obliged for their information, have, therefore, I think, quite proved the origin of the sign of the Eagle and Child.

WILD GOATS IN SCOTLAND.

The first thing I saw in the hall of my hospitable friend, Captain Colin Stewart, of Newton Stewart, County Wigtown, was the bleeding head and horns of a very fine goat, which had just been cut off the animal. It was a splendid head with very fine horns, 1 foot 9½ inches long, and a grand beard. Captain Stewart kindly gave me the head, which has been admirably set up by Mr. Edon.

The next day, when inspecting the salmon rivers Cree and Minnock, Captain Colin Stewart gave me the following interesting particulars about the goats of the district. These animals are semi-wild, and live high up among the grand mountains to the east of Wigtown Bay. They are all owned by somebody; the farmers catch them as kids, and put their own mark on the ear; and then let them go again. When harvest time comes round, the farmers begin to "drive the goats," and they feed the harvest labourers upon the goats' meat. They surround the flock of goats as well as they can, and drive them towards the steepest precipice in the neigbourhood; they then send in dogs which pin the goats, which are at once slaughtered. If I understand aright, the dogs are let loose at the goats, just before they get to the precipice, and so the goats are cut off by the men behind, and the dogs in front; the dogs are done if the goats get to the precipice, as they are terribly active among the rocks. One gentleman kills as many as twenty goats every year, and, in the hills about Newton Stewart, at least fifty goats are killed every year; a good goat will give about 60 lbs. of meat. When a goat is caught and killed in the common hunt, his ear is examined, and he is at once sent to the farmer who has fixed his mark upon the beast. This is done with the greatest fidelity; each farmer has his own mark. If a goat is unmarked, he becomes the property of whoever catches him. The billy goats are in best order in August and September. The farmers never shoot the goats, they only catch them at the proper time of "goat gathering." If they cannot catch the goats one year, they hope to catch them next. The goats are very artful and

wary, and require careful "gathering;" many escape every year.

I have never tasted goat's meat, but I believe the harvest-men eat it readily.

O dura messorum ilia !

I once heard of a stingy old lady, who, to the astonishment of the town, invited a grand party to eat a "haunch of venison." The dinner passed off well enough, only it was remarked that the venison was "rather tough" and high-flavoured. The next morning it was remarked that "Old Billy," the well known oldest inhabitant of the stables, was missing. Poor Billy had been slain by accident, and had supplied the "haunch of venison."

Scotch River Pearls.

In passing over Moy Bridge, near the junction of the rivers Blackwater and Connor, Sutherlandshire, a gentleman who was with me told me that that part of the river we were then crossing was once celebrated for the number and quality of its pearls; but of late years they have diminished both in quantity and quality. The reason assigned for this was remarkable. According to the local theory "the building of bridges diminishes the number of pearls in the river." In former times bridges were not very numerous in Scotland, and the cattle, passing the rivers by means of the fords, trod upon the mussels, and by injuring their shells caused them to form pearls. After the bridges were built, the cattle no longer went across the fords, but over the bridges. The mussels

not being any more injured ceased to secrete the pearls. There was formerly an old man at this place who gained his living by collecting these pearls. The poor fellow was blind, but nevertheless he continued his occupation as pearl catcher. He used to wade into the river, and pick up the mussels off the bottom with his toes, his wife standing on the bank, telling him in which direction to go.

When he had filled the bag which he carried round his neck with the pearl mussels, he brought them to the bank for his wife to open. A pearl the size of a pea was worth £1. I was very sorry to hear the tragic end of this poor man. He got out of his depth, fell into a deep hole in the river, and was drowned.

Having heard that there were some exceedingly fine pearls among the Scottish regalia now in Edinburgh Castle, I wrote to a young lady residing in that celebrated city, and asked her to find out what she could about them for me. She was kind enough to go up to the castle, and the following is her report:—

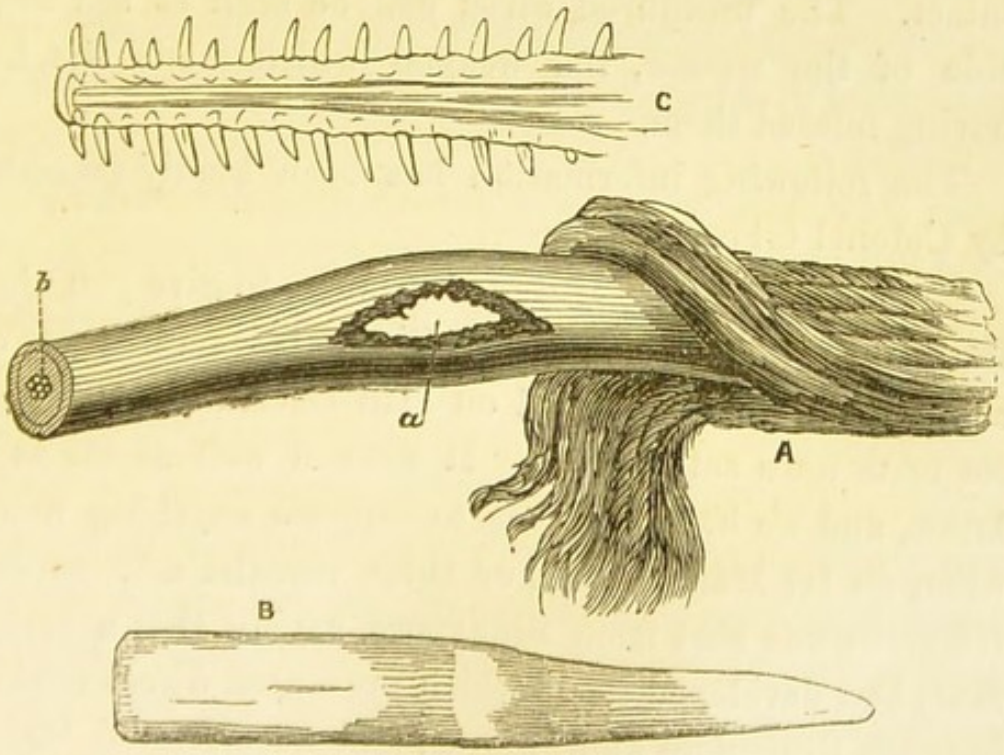
"Visitors have to look at the regalia at a respectful distance through a grating, so I can only tell you that the four large pearls are curious from their size, which seemed to me like that of a very large pea. They are said to be Scotch, but are more like oriental pearls in colour, having none of the slightly blue tinge which usually characterises Scotch pearls. Between twenty and thirty much smaller pearls are set in the circlet of the crown, but they look very common-place beside the four large ones on the velvet cap. The best and largest Scotch pearls that I have seen were got some years ago

in the Brora, a river in Sutherland, about ten miles from Golspie, and some, I believe, were got in Loch Brora. It seemed, however, an accidental 'take' of pearl mussels, as hardly any have been found since then. The Germans, I think, have a superstition about pearls that they are unlucky. Lessing, in one of his plays, makes somebody say, '*Perlen bedeuten Thränen.*' "

Some official attention should be given to the cultivation of the fresh water mussels which produce the pearls, or they will become exterminated. These very pearls may have been one of the causes of Julius Cæsar invading Great Britain. We read that he came "Propter margaritas Anglicas,"—on account of the English pearls.

INJURY TO A SUBMARINE TELEGRAPH CABLE BY A FISH IN THIRTY FATHOMS OF WATER.

By the kindness of Mr. Latimer Clark, C.E., engineer to the British Indian Extension Telegraph Company, I had submitted to me, in June, 1873, a portion of the



TELEGRAPH CABLE AND TOOTH OF SAW FISH.

submarine telegraph cable laid between Penang and Singapore, of which the engraving will give a good idea. The drawing is made the actual size of the injured portion of the cable.

A hempen rope (A) is tightly coiled round the gutta-percha portion of the cable. This was, of course, underneath the iron wires which formed the outside of the cable. In the middle of the gutta-percha, the copper wires are seen embedded at *b*. In the middle of this gutta-percha there is a jagged hole exactly the size and shape of that given in the drawing at *a*. A minute observation of the interior of the wound shows that three of the wires at this point are snapped right across, the broken ends being all thrust in the same direction, viz., *away* from the spectator as he examines the drawing. The remaining four wires (there are seven at the point *b*), however, remain intact. The uninjured wires can be seen at the lower side of the wound, the weapon which made the hole having missed them.

The following information has been kindly furnished by Colonel Glover, R.E.:—

"I really have very little information to give you about the fault in the Penang and Singapore section of our cable. The cable was laid on 11th December, 1870, and its tests were satisfactory. It worked well as far as we know, and we had no reason to suppose anything wrong, when on 1st March, 1871, or three months afterwards, a telegram was sent from Singapore, saying that a serious fault had developed itself, which prevented direct working between Singapore and Madras, and necessitated 'transmission' at Penang. Work was carried on this way for some time, when, in June, one of our vessels went out, found out the fault, and repaired it on the 7th June, 1871. After this the tests were satisfactory, and the cable has continued so ever since. The fault was two hundred and

twenty-two miles from Singapore, and in thirty fathoms water; the bottom being marked sand and mud. The report which came home to us was that a bony substance had been found jammed hard in the cable through the wires, and it was supposed to have been done before laying. As we could not understand why the original tests should be good if the substance had not existed, and why failure should be sudden, I did not believe this, and on receiving the faulty specimen I went to Willoughby Smith, and we opened it together. The bony substance appeared to us a fish tooth, and probably a shark's; but as no mark of the other jaw appeared, we were puzzled, and gave it to you. This is all the information we possess, nor, indeed, can I see how we can get more, as no persons have seen it since."

I confess I was exceedingly puzzled with this most difficult problem. The hole towards the spectator is two-thirds larger than it is on the opposite side. If it had been an ordinary fish, such as a shark, there ought to have been the marks of a bite on *both* sides of the cable, namely, of a tooth in both the lower and upper jaws. This wound, therefore, must of necessity have been made by a fish having but one tooth, and one tooth only; but what fish is there that has only one tooth? For several weeks I kept the specimen on my mantelpiece, and was constantly thinking over the puzzle. At last one day I hit it off, all in a minute. On going round my museum I observed with most intense interest a beak or saw of a sawfish (*Pristis antiquorum*), presented to me by Dr. Day, Inspector of Indian fisheries, the fish having been taken in the Andaman Islands. "That's the fellow," I said to

myself, "that made the hole in Mr. Latimer Clark's telegraph cable;" so, taking one of the teeth out of the beak of the sawfish, I placed a spare portion of the telegraph cable on the table and struck the end of the tooth with the mallet, and immediately produced a wound almost, I may say exactly, similar to that found on the Penang telegraph cable. This tooth is seen at B.

My theory is, therefore, very simple, and I think is correct, viz., that the perpetrator of the wound was a big sawfish. The cable lay quiescent at the bottom of the sea, when one day a sawfish came by, hunting for his dinner. The mode which the sawfish adopts to get his food is, I believe, by waving his saw horizontally right and left, and turning up the mud or sand in order to dislodge the delicate-bodied marine creatures on which he subsists. His teeth will tell us he cannot eat hard substances. When thus engaged in his submarine digging, the sawfish suddenly came across the telegraph cable. His beak getting entangled in it, he gave it an extra blow and a smash downwards, and finally getting enraged, hit it so hard that one of his teeth went between the outer wires—through the hempen rope—and then through to the gutta-percha, injuring the wires. These various substances probably then held the tooth somewhat tightly. The fish then struggled and broke his tooth short off, leaving a bit of it actually imbedded in the cable among the wires.

I am inclined to think that the sawfish uses his formidable weapon to stir up the mud in search of his food, because the points of the teeth in the saw, which are composed of a very hard bony substance, are always very sharp, as sharp, in fact, as the tips of a wild boar's tusk,

which, as we all know, are kept finely pointed by constant friction.

I have made a section of a tooth of the sawfish as represented at B in the drawing. The light-coloured portion which fits into the blade of the saw is cellular, and presents the structure of a common walking-cane. The sharp point will be observed in the engraving. At C, there is a small drawing of the entire beak of the sawfish, and I leave it to the reader to weigh the evidence I have now adduced, and consider if my theory is correct.

I have submitted the small portion of the bone, which was actually embedded in the wound, to my friend Mr. Henry Lee, who, after microscopic examination, says, "It is more like the tooth of the sawfish than anything else." This report agrees entirely with my own observations.

"JEMMY" THE WALRUS.

THE 1st of November, 1867, will ever be memorable in the annals of Natural History as the day on which a living walrus (*Trichecus rosmarus*) arrived at the Regent's Park Zoological Gardens. As it was late in the evening when the van containing the animal arrived, Mr. Bartlett determined to place the huge box, in which the beast had travelled, alongside the enclosure set apart for his accommodation, and to leave him undisturbed for the night. The next morning a portion of the wire-work of the enclosure was taken down, the box shifted close up to the aperture, a plank carefully removed, and out came the head of the walrus. The poor beast snuffed and stared about, wondering where he was. We waited, quite silent, and then out he came, further and further, till at last, finding the road clear, he waddled right out on to the open. The first thing he did was to put down his great nose and to sniff at the grass—he had, probably, never seen grass before—he then went straight up to a little tree, and examined it with the same sort of curiosity with which we spectators were examining him. He then made direct for the pond, and pulled himself up on to the edge, first with his chin and then with his flippers. After looking round again, he ducked his head under water with the

same kind of eagerness that a two months' absence from a bath would be likely to produce in a water-loving animal. Finding it all right, he slipped into the water with the noiseless glide of an otter; down he went, luxuriating in the bath for which he had pined for two months or more. After a long dive up came his intelligent head to the surface once more, and he gave a long and anxious look round.

At this moment we were much amused to observe the seals in the pond close by. These pretty little things had "clambered" to the edge of the stone parapet of their pond, and were all eyes, expressing intense wonder, at the poor walrus, in whom, possibly, they recognized an old acquaintance. Jemmy—for that is the name of the walrus—then came out of his pond, and up to the railings, so that we had a good look at him. He was just about the same size as the sea-bear. I tried to take his measurements, but the moment I put the tape near him he turned round and looked so terribly fierce, that I, of course, instantly desisted.* He probably thought the tape was a rope, and knowing from experience that a rope was no friend of his, objected to its coming near him. His head is seal-like, but the bloodshot eyes are not so large; there are no apparent eyelashes, and they reminded me much of the eyes of the hippopotamus. Their colour is dark brown, and the pupil exceedingly small. It is, as far

* Dr. Murie, in his valuable monograph on the walrus, subsequently gave these dimensions: extreme length, 7 feet to 9½ feet; muzzle to tip of tail, 6 feet to 8 feet; girth round the neck, 2 feet to 4 feet; girth round thorax, 4 feet to 3 feet; greatest stretch of transverse diameter of fore limbs, 4 feet to 8 feet.

as I could make out, not circular, but vertical, like that of a cat. I think this peculiar structure is given to preserve the retina of the eye from the glare of the sun on the ice, and save the animal from "snow-blindness." Again, it doubtless has to do with his being able to see during the semi-darkness of the long arctic winter: possibly it serves both purposes.*

The colour of Jemmy's coat is tawny, not unlike that of Scotch snuff; his hair is rather short, and throws off the water easily from its surface. When damp, it is apparently divided into diamond-shaped patterns, like a quilted petticoat. In his walk he wriggles much more than the sea-bear. His hind flippers are connected together by loose skin†; on land they appear awkward, but in the water they give him great facilities of swimming. When

* Dr. Murie, when examining the eye after death, writes: "I had thought the intense redness of the conjunctival membrane was due to pathological lesion; but I find that several voyagers call special attention to the red eye of the walrus. This unusual condition, therefore, must be a natural one, the physiological reason of which I am not prepared to give."

† Dr. Murie remarks: "A notable peculiarity in this animal was the curious wrinkled condition of the skin. The cutaneous wrinkles and furrows varied in height, depth, and direction in the several regions of the body, and altered considerably, according to the position assumed. The stuffed skins found in museums, of large or full-grown walruses, give no idea whatsoever of the characteristic in question. A plausible reason may be assumed. Periodically the walrus becomes very fat, and during such times the elastic capacity of the skin allows of sufficient storage room for the superabundant adipose tissue. Mr. Lamont says the walrus has not nearly so much blubber in proportion to his size as the seal. Thus a seal of 600 lbs. will carry 200 lbs. or 250 lbs. of fat. An ordinary walrus may weigh 2000 lbs.; but his fat will not exceed that of a seal. A full-sized old bull walrus must weigh at least 3000 lbs., and such a walrus will produce at most 650 lbs. of blubber, but seldom more than 500 lbs."—The badger has naturally a

displeased he roars famously. His voice is not at all unlike that of a lion, only, of course, not so loud. He is supposed to be about eight months old, and is certainly not so big as he will be. I make him out to be over seven feet in length. A full-grown walrus will measure some sixteen feet long, ten feet in girth, and have twenty inches to two feet of tusk, and a weight of over 3000 lbs. Jemmy's blunt muzzle is the most peculiar part about him. It is full and fleshy, like the "mouffle" of a North American elk. The whole of its exterior surface is covered with strong whalebone-like whiskers; the uppermost rows of these are quite short, the lower are much more developed, being from two to three inches in length. The points of all these whiskers are directed downwards, and somewhat towards the median line of the nose. They look stiff, like wires, but to the touch are soft, like the wetted bristles on a camel-hair brush. I have now some walrus bristles before me—they are not from Jemmy's nose—when wetted in warm water they become quite soft. Their colour is exactly that of a tortoiseshell-comb, and they resemble the teeth of a comb in other ways. They are quite hollow—like a rabbit's tooth—for one-third of their length. As in the lion and seal, so also in the walrus, these apparently rude organs of touch are exceedingly sensitive. The conical cavity of the whisker is filled with nervous pulp; in fact, one might almost say that the whisker is simply a horn cap upon the top of an exceedingly large nerve. In the skull the foramen, through which these

very loose skin. As in the case of the walrus we do not know why; I do not think the "fat theory" will do. The fact is, we don't know, and we had better say so. If we could observe the "walrus at home," we might find out the reason.—(F. B.)

"nose nerves" send their main telegraph wires to the brain, is exceedingly large, larger even than in the lion.

"Jemmy" has two tusks; they are but about two inches long—recollect that "Jemmy" is only a baby; nevertheless, when angry he curls back his great lips, shows his tusks, and at the same time he chatters his teeth together with great rapidity, making a noise like the chattering of teeth when a man is very cold, only of course the sound is much exaggerated. Quære, is the walrus so subject to cold that this teeth-chattering has become a permanent habit? Again, it is not unlike the noise of the wooden clappers used by boys to scare the birds from the fields. This chattering is certainly a new idea to most of us.

I was not, of course, able to examine "Jemmy's" teeth, but I have a walrus-skull from my museum now before me. It is that of an adult animal; length, 1ft. 4 in.; weight 15 lbs. There are two large cavities on each side of the angle of the upper jaw, each six inches deep; into these, the tusks proper are inserted. A skull which Mr. Bartlett has placed by "Jemmy's" house weighs, with tusks, which are 14 in. in length, 25 lbs. (One can hardly credit the terrible want of common sense on the part of some people. A visitor, seeing this skull hung up on a tree by the walrus house, asked, in all seriousness, whether the walrus had shed his skull, and if so, if that skull on the tree was the last one shed.) In the upper jaw are eight teeth, four on each side; in the lower also four on each side. They are by no means formidable in appearance, being like tapered pegs of wood fixed into a simple hollow in the bone. The dentine is worn away from the inner side, so as to

leave the enamel a sharp cutting edge on the outer side. The teeth of the lower jaw work against those of the upper. It is curious that the two front molar teeth of the lower jaw do not correspond with their fellows in the upper: each tooth works but half the surface of that above it; the two front teeth, however, correspond exactly. The projecting tusk cavities prevent much motion of the lower jaw from side to side, but it has free play up and down; by rattling the teeth together, I produce the chattering—the same song that "Jemmy" sings when anything displeases him. The working teeth of the walrus seem to be all consolidated into the two huge tusks which ornament each side of his head; with these he can rake up the sea-weed and sand, using them like a two-pronged hoe. He doubtless does this when he wants shrimps and mollusks for dinner.* He can fight the other walruses; he can drag a boat's edge down to the level of the water, or, using them as an "alpen-stock," can climb up the sides of the ice-covered rock. The visitor has only to watch

* The author of "Sport in Norway" thus writes in confirmation of this theory:—"In 1861, during a residence in Norway, I made the acquaintance of a Swede, Magester Torrell, who had just returned from Spitzbergen, where he had been on a scientific expedition. He told me that he was fully of opinion that the tusks of the walrus, among other uses, such as for hanging on to the edge of the ice, &c., were much, if not mainly, employed by the animal for the purpose of digging up food from the bottom. Not only did the peculiar 'dung-fork' shape of the tusks lead him to infer this, before the stomach of a dead walrus was examined, but when, on opening the stomach of one, a quantity of bivalve shells (*Mya truncata*) were found in it, of a species that always lies buried at least one foot below the surface of the mud, he and his colleagues felt convinced that the tusks were employed by the animals for the purpose of digging up their food." The partiality of "Jemmy" for mussels seems also to confirm this idea.

"Jemmy," to see at once how—his tusks not being yet developed—he will hold on with his chin when he wants to climb, and pull himself up; in fact, the rascal tries to climb the fence of his enclosure; if he has his chin once on the top, he is "as good as over." These tusks (and his oil) are the *casus belli* between the poor walrus and the sailors of the whale-ships. I lately saw a great lot of them at a city warehouse. They are of uniform texture (unlike elephant ivory), and are, I believe, used principally by the dentists, who prefer, for making artificial teeth, walrus, hippopotamus, and whale ivory to that of the elephant. It is possible that the walrus was at one time pretty abundant on the British coasts. Some suppose that the ivory bits, of British manufacture, exported to Rome were made of walrus or narwhal tusks.

The nostrils of the walrus are very peculiar; they have not apparently the same arrangements of the sphincter muscle that we find in the seal, hippopotamus, &c.; but a kind of lobular projection is thrust forward at the will of the animal; this projection accurately fits the nostril—there is one on each side—and acts like a cork in the neck of a bottle. When these curious doors are open one can look right into the nostrils, which are perfectly circular, and about big enough to admit a large cedar pencil. I am no disciple of the development theory, but keep to the path so plainly pointed out by the Bridgewater Treatises, by Paley, and by Ray and Durham, in their "Physico-Theology;" and cannot help seeing in the peculiar mobile lip, in the whiskers, and nostril of the walrus, an adaptation to the means of its existence, giving a clue to the determination of the food of the beast.

It has been stated that the morse or walrus is herbivorous. I cannot think this is the case; for in its general structure it agrees more with the seals than with any herbivorous animal.

What, then, is the food of the walrus? Mr. Bartlett informed me that when "Jemmy" was first captured at sea he sulked for two or three days, and would eat nothing. The sailors then offered him strips of fat pork.* Finding it, I suppose, not unlike his mother's milk, he devoured it readily, and from that time his daily rations on board ship consisted of from seven to eight pounds of fat pork; besides which, the sailors occasionally added oatmeal-and-water, which they poured down his throat by means of a spout. When they got near Shetland, they found "Jemmy's" allowance pressing rather hard upon their own mess; so they got some mussels for him—gigantic fellows, six inches in length, and proportionately wide—and, opening the shells, gave him the meat, which he much enjoyed. When Mr. Bartlett first took charge of him at Dundee, the poor beast looked very thin, and

* Writing in *Land and Water*, "Arctic" thus describes the way in which his pet walrus (see *postea* page 291) was fed.—"The stomach of the mother only contained a small quantity of chyle, so we were quite at a loss what to feed our captive on. Unsuccessful attempts were made to induce him to drink oatmeal-and-water, and to suck the teats on the hide of his defunct parent, from which the "blubber" had not been removed. He lay on the maternal remains all night, and next day was offered a strip of blubber from it, which, to our great delight, he began to suck with apparent gusto; and, during the three months we kept him, he had—with the exception of an occasional basin of pea-soup—no other food but strips of his mother as long as she remained fresh, and afterwards of whale-blubber, which was tied to his kennel in such a way as to prevent his swallowing it. On several occasions, notwithstanding our precautions, "Jemmy" sucked too hard, and had narrow escapes from choking, owing to the smallness of his gullet."

the men agreed that he was going wrong. He then suggested fish diet; the men told him that they had tried fish, but "Jemmy" had spit them out, and would not swallow them. Mr. Bartlett was sure that the reason of this was, that "Jemmy" could not swallow a *whole* fish if it were larger than a herring. Nevertheless, he went to the market, and bought a large cod; he cut it *into strips*, free from bone, and was delighted to find that "Jemmy" would suck down these strips; in fact, he greedily devoured a whole cod weighing at least eight pounds. Finding this to be the case, Mr. Bartlett took a good supply of cod, &c., on board the steamer, and fed the hungry captive as he came along. "Jemmy's" diet in the gardens is principally fish; the flesh only is given him, and this is carefully cut up into strips and washed in water, to avoid all danger from fish-hooks, as hooks in fish have proved the death, not only of many seals, but also of a sea-bear at the gardens. When he sucks in his food, it slips down with a loud "flop."

When at home, it is probable, according to the evidence of the sailors, that the walrus feeds largely upon shrimps: they told Mr. Bartlett they found the stomachs full of shrimps and prawns. On one occasion the prawns from the stomach of a walrus were so fresh that they might have been cooked. May not, therefore, the whiskers of this beast be of use to him in hunting for shrimps, mussels, and other soft and nutritious things in the sea sand? I argued, from their action when the beast was snuffing the grass, that they might also act in some degree as a trap to help him entangle these active little creatures, and doubtless he eats crabs as well as shrimps; he may



"JEMMY," THE WALRUS.

[*To face page* 289.

catch small fish also, but I do not see how he is to catch the large ones. That is the peculiar business of his first cousin the seal, and it is curious to remark how the walrus, being a "bank animal," does not poach upon the hunting grounds of the seal. Mr. Bartlett, indeed, by a process of ingenious reasoning, solved the difficult problem of the food of the walrus. Arguing from what he observed of the beast, and from what he learnt from the sailors, viz., that the food was of small size, he obtained from Billingsgate a bag of whelks and a bag of mussels; having removed the shells, he gave "Jemmy" two quarts of whelks and four of mussels mixed together. This soft and gelatinous food—which is probably his natural aliment—suited him admirably; he devoured six quarts of it daily. The walrus uses his whiskers like brushes, to draw to his mouth what he likes, and push away what he dislikes, and probably when at home he searches with them for soft mollusks in the sand. This observation of Mr. Bartlett's of the real use of the whiskers of the walrus is most valuable and interesting.

In the illustration will be seen an excellent portrait of the walrus "Jemmy."

By the kindness of Mr. Bartlett I am enabled to give the following particulars of the capture of the animal:—Captain Richard Wells, of the steam-whaler *Arctic*, of Dundee, was, on the 28th August last, in latitude 69° N., longitude 64° W. According to the map, the locality may be fixed, between Cumberland Island and Disco Island, in the centre of Davis' Straits, on the west coast of Greenland. Captain Wells saw, basking upon the ice, between 250 and 300 walruses, and sent out his

boats to kill as many of them as possible. Among those killed was a very large female. Captain Wells fastened this animal to the stern of the boat, to tow her to the ship; he soon found out that her cub was clinging to her, and the poor thing followed its dead mother to the side of the ship. When the sailors had hauled the mother on board, the cub still remained alongside, and they managed to catch him round the neck with the bight of a rope, and haul him also on board. At first they tied him to a ring on the deck, and afterwards made a big box for him. When Mr. Bartlett arrived at Dundee, he found the walrus still in this box, and wisely determined to bring it direct to London by sea. He fortunately found the steam-ship *Anglia*, Captain Speedy, just about to start, and came straight away, with his valuable charge, to London. Captain Speedy and his officers showed Mr. Bartlett the greatest attention, and afforded him every facility both in shipping and in landing the animal.

Few people have any idea of the dangers incurred by whalers in the Arctic Seas. The ships are built exceedingly strong, and necessarily so, for the work they have to do is very perilous. At the end of the last whaling season the *Arctic* had to cut a passage through the ice by sheer main force. With all her steam up she charged a barrier of ice, crashing a passage through it. No less than five times did she make her fearful charge, succeeding at last in forcing a way through; five ships then followed her out of the ice, which threatened to impound them in a fearful prison, and to subject them to all the horrors of an arctic winter.

I am sorry to say that poor "Jemmy" died at the

gardens December 19, 1867. In his stomach were found numbers past counting of small roundish parasitic worms —a new species of Entozoon.*

Having thus placed on record a memoir of poor "Jemmy," I think my readers will be interested in the following account of a previous "Jemmy," which was kindly sent to me, for publication in *Land and Water*, by a gentleman writing under the *nom de plume* of "Arctic."

Early in the summer of 1861 a solitary female walrus was harpooned by Captain J. B. Walker, of the steamship *Wildfire*, of Dundee, in Davis Straits. Immediately after the smoke of the harpoon-gun had cleared away, a sound, somewhat resembling the grunt of a pig and the bark of a dog, was heard close under the stern of the boat, which proceeded from a baby walrus. I was steering, so I leant over and caught hold of one of its fore flippers, and, with the assistance of one of the men, pulled it into the boat. It proved to be a young male, and was about three feet long. Our pet, like the distinguished arrival at the Zoological Gardens, was immediately named "Jemmy" by the sailors.

I cultivated "Jemmy's" acquaintance assiduously, and he soon became very friendly. Ordinary scratching and patting made little impression on my pachydermatous friend, who, however, turned over on his side and grunted with satisfaction when I scratched him with a heather broom. He was always extremely docile and fond of society, and this gregarious instinct was of considerable service to our "spectioneer," as the officer in charge of

* *Ascaris bicolor.* Dr. Lee, Proceedings of the Zoological Society, 1868, p. 67.

the third watch on board a whaler is called. This functionary was unfortunately not remarkable for the possession of great administrative talents, and prior to "Jemmy's" advent had great difficulty in keeping his men from going below to the galley fire, on the cold nights in the early part of the season; but "Jemmy"—who, if shivering may be considered any criterion, felt the cold as keenly as they did—sternly set his face against this breach of discipline, and so soon as he observed an appreciable diminution in their numbers, began to bark vigorously, and thus drew the attention of the officer to the skulkers. I was often much amused by watching the great state of excitement he got into when a boat got fast to a whale, on which occasion it is customary to "call all hands," who then rush on deck, only partly dressed, shouting, "A fall! a fall!" "Jemmy" would then shuffle about, barking loudly and getting into everybody's way; when the ship was deserted by almost every one but the engineers, firemen, and the man at the wheel, he moved about the deck in great distress, barking and looking into every corner, climbing upon a chest which stood below a ventilating scuttle in the bulkhead of the poop, through which he could command a view of the interior of the cabin, searching for a companion, and would not be comforted until some one came and patted him and spoke to him.

"Sallying" the ship, in order to break the ice when the ship got wedged in a narrow channel, was another period of excitement for him; at the word "over" he would attempt to follow the men as they rushed from side to side, but from his slowness of locomotion he seldom

reached one side before the order was given to return; he would then give a short bark of disappointment and turn again, but never seemed to tire of the amusement. When called by his name he would, when he knew the voice, come shuffling along from one end of the ship to the other. He conceived a strong affection for a young Esquimaux dog, which I obtained from the natives in Pond's Bay; he good-naturedly shared his kennel and food with him, and seemed terribly annoyed that he could not keep pace with him in walking about the deck; and he certainly exhibited much more intelligence and affection than this degraded but useful section of the canine race seemed capable of. On several occasions he was lowered into the water for a bath by a tackle from the mainyard, but this was a kindness which he never seemed to appreciate, as he immediately swam to the boat, looking up and grunting as if asking to be taken aboard again. On the last occasion on which he had a bath one of the men frightened him away with an oar, in order to induce him to take a longer swim, when he dived under the edge of the floe at which we were lying, and did not reappear for so long a time, that we began to fear he was lost, and when he did get out again he was very much exhausted. He was shortly afterwards seized with a severe cold in the head, and died within a fortnight, apparently from the extension of the inflammation to his lungs. I think it probable that the irritation from cutting his tusks may have contributed to cause his death, as they were at that time about an inch and a half through the gum. During his illness he was very much troubled with coryza, and would steal up softly behind the men

and wipe his nose on the legs of their trousers; he was on this account supplied with a swab, and quite understood the use for which it was intended. Poor fellow, when I visited him a few minutes before his death, although very weak, he knew my voice at once, and slightly raised his head and gave a low grunt of recognition. I intended to have preserved his skull, but unfortunately, through the stupidity of one of the men, it was thrown overboard during the night.

I trust that the time is not far distant when we may again have the opportunity of seeing a walrus at the Zoological. "Jemmy" cost something like two hundred pounds, so that it will be worth the while of whaling vessels to see if they cannot bring home a "Jemmy the Second."

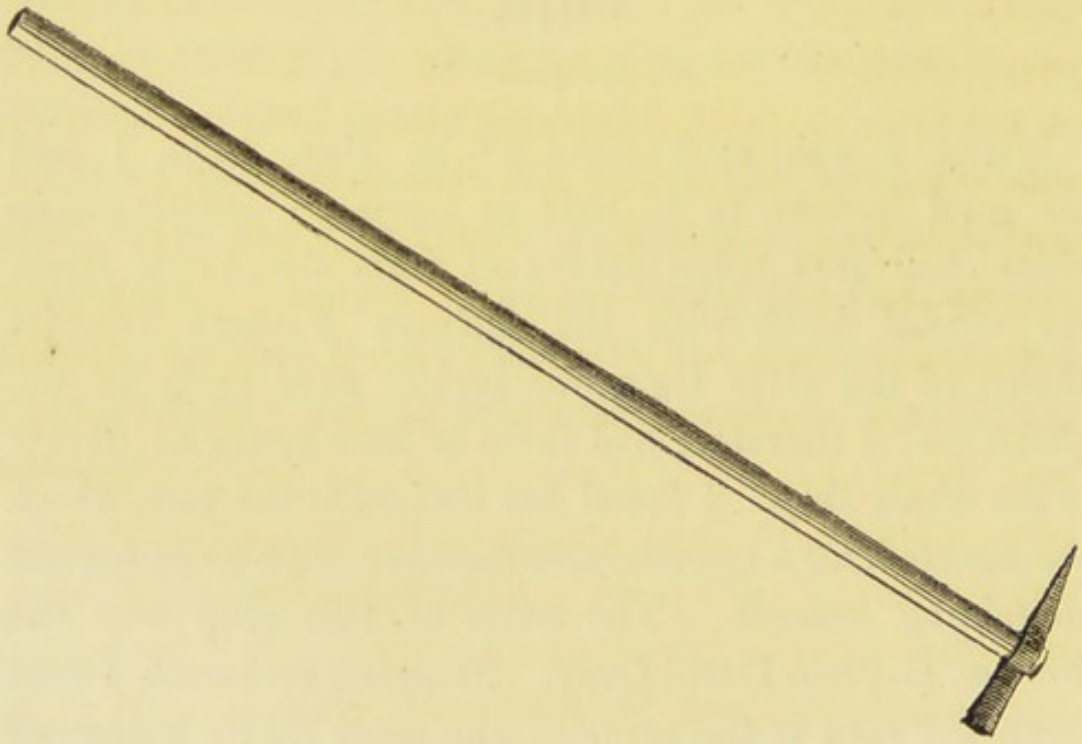
THE ECLIPSE WHALING AND SEALING SHIP.

When I was at Peterhead* in May, 1870, I had the good fortune to be able to inspect a whaling-ship which had just come into port from the Arctic Seas. My official work with the Salmon Fishery District Board of the river Ugie was luckily over early in the afternoon; I therefore had three or four hours to devote to the whale-ship. I found her alongside the pier, which was covered, for a considerable distance, with huge barrels containing seal-oil. The name of this ship was the *Eclipse*, Captain David Gray. Stepping on board, I sent down my card to the captain, who most kindly welcomed me at once into his cabin. The Captain said he knew my name perfectly well from my writings. It is, therefore, some little comfort that they afforded amusement and

* The Peterhead Museum contains many most interesting Arctic specimens: a splendid harp seal, presented by Captain Gray; a fœtal walrus, about six inches long; a fœtal black whale from Greenland, about sixteen inches long, no whalebone yet developed; a fœtal seal, which the old woman, the curator of the museum, said truly, "was just like a little cat;" several Esquimaux things now getting rare; a magnificent walrus's head; and, above all, "Captain Ross's stocking," to which the attentive and polite lady curator, Mrs. Adams, kept perpetually calling my attention. This is evidently a precious relic in her sight. When I appeared not particularly interested in it, she said, pointedly, "Some people thinks muckle of it, *some* people nothing of it."

instruction to gentlemen among the icebergs of the Arctic Seas.

The *Eclipse* is a fine screw-steamer, whose sole business is to pursue and catch seals and whales. She is 29 feet wide, and 150 feet long, and built of amazing strength. About forty feet of her, outside, from the stem,



CLUB FOR KILLING ARCTIC SEALS.

is, as it were, double armoured with an amazing thickness of oak planking, and iron bolted together in the manner which experience proves is best suited for fighting ice. The cut-water is made of iron, forming a very sharp wedge to split the ice. Woe betide any ship that "collides" with her, or any ordinary ice-floe that opposes her course.

The voyage from which the *Eclipse* had just returned had been very successful. She had been after seals only, and had killed no less than thirteen thousand,—

two thousand six hundred being adult seals, ten thousand four hundred being young seals, the total value of the cargo being about £12,000. The ship had been away two months only. The seals had yielded two hundred tons of oil. The cub seals grow very fast indeed, and at twelve days old are large enough to be killed. Captain Gray gave me the skin of one of the pups, which is now in my museum. I saw a great pile of the skins (all salted down) of these little seals in the warehouse. To kill the seals the sailors go on to the ice with what are called "clubs." These are almost exactly the same instruments as those used for poleaxing horses, and consist of a sharp spike and a hammer-headed end. This implement is fixed on to a long but strong and light handle, so that the sailors can poleaxe the poor seals before they have time to bite or get far away. Captain Gray gave me a seal club, which is now in my museum at South Kensington.

The hold of the *Eclipse* is almost entirely occupied by huge iron tanks, which fit into the shape of the vessel. There is a man-hole in each tank, and the oil is hoisted out of it with a bucket worked by pulley and rope. When the oil gets low, the men go into the tank to scrape out the bits called "finks" left in the bottom. Each iron tank holds some thousands of gallons of oil and finks. I do not envy the men who have to go down into these tanks. The whole ship smelt unpleasantly of oil, but the information Captain Gray gave me was much too interesting for me to mind that. The seal-oil is taken to the boiling-house, not far from the ship, and boiled. After boiling twenty minutes it comes out like beautiful pale

sherry, and doubtless would be as good for invalids as cod-liver oil. Seal-oil is in much demand for some manufactures, especially in the preparation of jute, to which it gives a silk-like appearance. But if the seals are killed at the present rate the jute people will have to look out for some other kind of oil.

Captain Gray and his ship *Eclipse* are also celebrated for the killing of whales. I examined the tackle used for this purpose. It consists of harpoons, lances, knives, etc., fixed on a long handle. Captain Gray has found from experience that it is better to shoot the harpoon from a gun than to allow it to be thrown from the hand of a sailor. The whale-gun, made by Greener of Birmingham, was lying in the cabin, and I examined it carefully. It is like a stumpy duck gun with a very large bore. The lock is covered over with a brass case in order to keep the wet out. It is placed on to the bow of the whale-boat, on a joint that turns every way, and is fired from this position. The charge is twelve drachms of gunpowder; ten or eleven fathoms is the greatest distance it is advisable to fire this gun at a whale. The harpoon makes a curve in its flight.

I had a long argument with Captain Gray as to which was the most vulnerable part to fire into. The captain asked me at what part of the whale I would aim. I told him the head or the heart. He said I was quite wrong, and the proper place was the tail, for this reason—the tail is the whale's chief propelling power, and if you cripple his tail, it is like injuring the screw of a steamer. It is, however, difficult to get at the tail, as it is always under water. The harpoon lines are neatly coiled up in

the boats, and they are joined together, so that when one coil is out another immediately comes into action. The lines pay out from the inside, like a ball of twine. Each coil of line is 720 feet long, and there are about five coils to each boat, all spliced together before starting. The whale-line is very strong, but very supple. Each yarn is tested to bear a hundred-weight, and there are thirty-two yarns in a strand, and three strands in a single line. If there is not enough line in one boat, another boat comes alongside, if possible, and pays out her lines. Captain Gray has known as much as two miles and seventy-eight yards run out by one whale.

An old man, James Milne, who was boiling the seal-oil, told me that on one occasion, when harpooner's mate in one of the whaling-boats, his legs were caught by the line when the whale was fast, and he was dragged under water with the velocity of a cannon-shot. He did not know how far he was carried under, but it must have been an immense depth before he got clear of the line. His bonnet came up first and showed the men where to look for him. When he did reappear, he came up close to the boat, so his life was saved. "But," says the old man, "we got the fash after all." Captain Gray said that, apart from the great value of the whale when caught, whale-shooting is the finest sport in the world. He does not approve of explosive harpoons. He killed a whale that had been fired at by a German whaler with an explosive harpoon. The whale had been struck fourteen days before by the German. He did not seem to be much the worse for it.

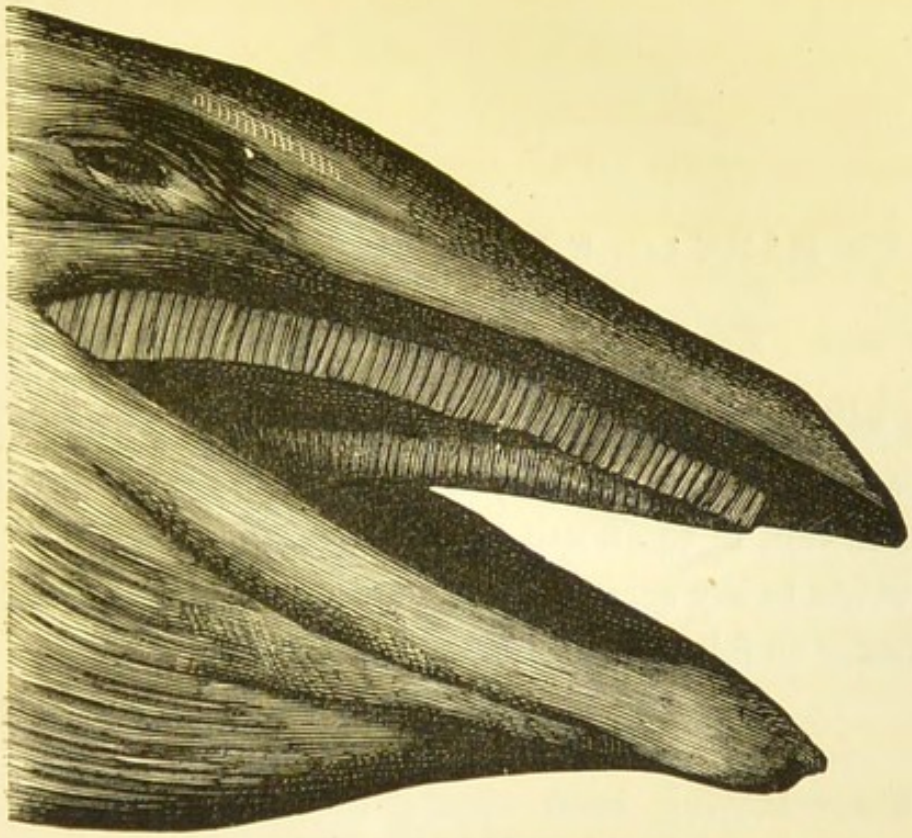
Harpoons will remain a long time in whales. On the

30th June, 1863, the captain took a harpoon out of a whale with the following inscription:—"Pow and Fawcus, Newcastle, 1839," so that, supposing it was used when new, the whale must have carried the harpoon about with him, sticking in his blubber, for no less than twenty-four years. The captain also took two old harpoons out of whales in July, 1872.

The water in the Arctic Sea is in some places as clear as the firmament; in others it appears quite thick from the presence of millions of minute creatures. The whale not only eats the *Clio borealis*, but this living mass of animal life. These little creatures are not so big as a carraway-seed. In the middle of the body of each is a single drop of red oil. The captain has boiled some of these little beasts for an experiment, and has got oil out of them.*

* Mr. H. Woodward thus writes as regards whale's food:—"The whale's food forwarded to me through Mr. Buckland, from Captain Gray, of the Peterhead whaler *Eclipse*, proves to contain a large number of a small but graceful crustacean, belonging to the genus *Cetochilus*, which was so named by Roussel de Vauzéme, in the 'Ann. des Sc. Nat.,' 2nd series, 1, 1834, who gives a very interesting account of its use, as constituting, in a great measure, the food of the whale. Vauzéme was attached to a vessel employed in the whale-fishery in the Southern Ocean, and for four months the crew were engaged in the neighbourhood of the island of Tristan d'Acunha, in the South Atlantic, without his ever having been able to observe what formed the food of the whales. Leaving that quarter, however, at the end of that time, and steering for Cape Horn, he, one morning in the month of February, observed the surface of the sea streaked with red lines, of several miles in extent, and giving the appearance of blood to the water. The experienced sailors on board immediately announced that they had now reached the *pasture* of the whales. Accordingly, they very soon afterwards saw them sporting about in the midst of these ruddy banks. Upon examining the water thus coloured, Vauzéme found it was caused by an immense number

In 1870 I made a cast of a whale's head now in my museum. It was the Piked whale, *Balænoptera rostrata*.



HEAD OF PIKE WHALE.

He was 13 feet long. I could not afford to cast more than his head.

of small crustaceans, which were of a red hue. They swarmed in myriads upon the surface of the sea, and when the wind was boisterous a whole bank of them would be taken up by a wave, and carried on board, covering the deck and the clothes of the sailors. The whales swallowed them in myriads, and they served for food not only to them, but to the Cirripedes (the *Coronulæ* and *Tubicinellæ*), which live as parasites upon their skin.

BARNACLES FROM A WHALE.

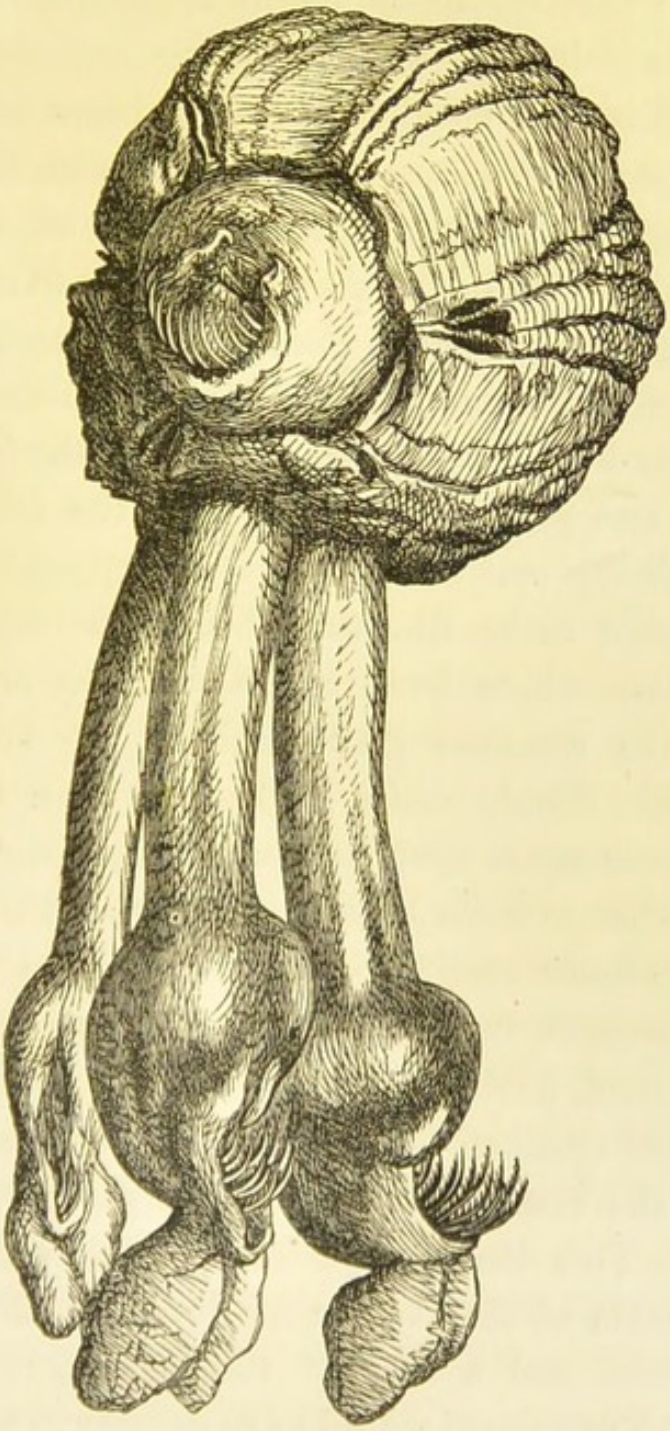
It will be recollected that in No. 5 of *Land and Water*, appeared an account of a whale being cast ashore near Kintradwell, in the north of Scotland.

I wrote to my correspondent, who most kindly answered the letter as follows :—

"Kintradwell, Golspie, N.B.

"Sir,—Having been among the first to board the monster when stranded, I secured the largest and best shells, and consigned them to a bucket of sea-water, where they lived for a considerable time. I therefore hope you will not find them much decayed. I should perhaps mention that they were attached principally in thickly-studded patches round his nose and at the root of the tail, and that one or two specimens I have still by me are larger than those sent you. The dimensions of the whale were: length, 45 ft.; girth round the thickest part, 48 ft.; breadth of tail, 12 ft.; side fins, 8 ft. The belly very pure white and deeply corrugated, the furrows running parallel from stem to stern. The Crown have taken possession of, and sold, the fish.—W. H."

I now give the figure of this most remarkable and valuable specimen. Two—not one—species of barnacle



PARASITIC BARNACLES FROM HEAD OF WHALE.

have made their home upon the body of this unfortunate whale. The former is about the size and shape of a

Normandy pippin apple, and much resembles the usual appearance of the "acorn" barnacle, so common along our shores; this species is, however, peculiar to whales, and hence is called *Coronula balænaris*.

The shell is of a peculiar white hardness and colour, and from the centre of the shell can be seen the beautiful "casting net" apparatus, by means of which the creature which lives in the shell obtains its food from the surrounding water. Upon *Coronula Balænaris* another parasite has taken up its position; this is formed of a strong, finger-like cartilaginous substance, the head being formed by two projections, as though the beast had a double fool's cap on. By some, these appendages have been supposed to be like ears, hence its name *Otaria Cuvieri*. The whole head much reminds one of the flower of the common garden plant, the snapdragon. Why *coronula* should make its habitat upon the whale, and why *otaria* again upon *coronula*, I know not, except it be in obedience to some laws of animal parasitic growths, of which we know really nothing; though we can bring forward numerous examples of animals, both in the water and on the land, having a parasite peculiar to themselves. *Coronula* had attached himself to the whale's skin, and a portion of the skin still remains firmly adherent to the specimen. This double parasite is, I believe, very rare. In the museum of the College of Surgeons, there is but one specimen, and a note in the catalogue runs as follows:—"There is no record as to the way in which John Hunter became possessed of this remarkable specimen, but there is abundance of evidence in the collection that he purchased largely at the sale of Mr. Ellis's specimens;

and in the 'Account of several rare Species of Barnacles' given by that excellent observer of nature, in the 50th volume of Phil. Trans., p. 845, there is a figure of a similar specimen with the following description: 'This extraordinary animal (the naked fleshy barnacle with ears), of which there were seven together, was found, sticking to the whale barnacle, by Mr. Smith, of Stavenger, in Norway, who cut both kinds together off a whale's lip, that was thrown upon the coast last year, 1757, and immediately immersed them in spirits of wine, by which means we have been able more exactly to describe them.'"

John Hunter seems to have had great difficulty in getting whale preparations, for he writes elsewhere: "As the opportunities of ascertaining the anatomical structure of large marine animals are generally accidental, I have availed myself as much as possible of all that have occurred; and, anxious to get more extensive information, engaged a surgeon, at a considerable expense, to make a voyage to Greenland, in one of the ships employed in the whale fishery, and furnished him with such necessaries as I thought might be requisite for examining and preserving the more interesting parts, and with instructions for making general observations; but the only return I received for the expenses *was a piece of whale skin with some small animals sticking upon it.*"

The engraving of this most interesting specimen represents the *coronula* uppermost, with the *otaria* depending from it. The original can be seen in my museum.

THE GREENLAND SEAL FISHERIES.

CAPTAIN GRAY has most kindly given me the following most interesting and valuable paper on the Greenland Seal Fisheries—Habits of Arctic Seals:—

"The vessels bound for the Greenland seal fishing leave Dundee and Peterhead, the only two places in this country now engaged in the trade, about the first of March, and proceed to Lerwick, the capital of the Shetland Isles, for the purpose of completing their crews; the usual custom being to ship only the principal officers and boat-steerers in Scotland, making up the rank and file at Shetland. The other nations engaged in this trade are, Norwegians, Danes, and Germans. The vessels remain at Lerwick a few days, to allow the men time to get their clothes ready, many of them having long journeys to make on foot to bring their traps into town. At this time the men on board ship are busy in getting the fishing gear into order, and making everything secure to encounter the often very stormy passage to the ice. This will occupy about eight or ten days if the winds are favourable, but it often takes three weeks or a month if the north-east winds set in with their usual heart.

"The vessels make the ice usually about 72° or 73°

north, in the neighbourhood of the Island of Jan Mayen, a volcanic mountain rising eight thousand feet above the level of the sea. The ice, or pack, as it is called, is composed of numerous different pieces, varying in size from a pancake to an iceberg, closely packed together; hence its name.

"Upon this ice the young seals are pupped. In choosing the place for this purpose the old seals are influenced by several things: first, that the ice lies upon water in which their food abounds, consisting principally of a small kind of shrimp; second, that the ice is sufficiently sheltered from the sea, and at the same time as much exposed to the action of the swell as to keep it in motion, and prevent it from freezing into a solid mass, which would keep them from getting down to feed. Hummocky ice is also preferred, as it breaks the wind and gives the young seals shelter, which they know well how to take advantage of.

"There are four species of seals inhabiting the Greenland seas, the 'harp' or 'saddleback' being the most numerous. These animals congregate in large herds, and early in March come from the north to the place appointed for bringing forth and rearing the young brood. They seem to have a wonderful instinct in doing this, following each other in droves for days, all steering a course to their chosen breeding-place. They drop their young from the 16th to 22nd of March, beautiful little creatures, with long, soft, light yellow fur to keep them warm during their short infancy; and so rapid is the growth of the young, that if the weather is good, and they are left undisturbed, a marked difference in their size and fatness can be noticed day by day. By the 14th of April the old

ones have left their young to take care of themselves. The young ones at this time begin to cast the fur for the beautiful smooth spotted coat, which they retain until the third year, when they become full-grown.

"The old seals pair immediately after leaving their young; they go eleven months, and have but one at a time.

"The next in importance to the saddleback is the 'bladder-nose' or 'hooded' seal, so called from having a loose bag hanging over the nose of the male, which it has the power of blowing up, and it always does so when enraged.

"This seal is twice the size of the saddleback, is black in colour, and spotted somewhat like a leopard.

"Before the rifle came so much into use, the old bladder-nose was held in deep respect. Many a time a boat's crew have had to beat a hasty retreat off the ice into the boat after having had their seal clubs snatched out of their hands by this powerful animal. One peculiarity about them is that the females are not more than half the size of the male. They are more irregular in giving birth to their young than the saddleback; and, strange to say, the young ones cast their fur in the mother's womb, and it is found lying beside the young in round balls. They are always most numerous near the saddlebacks, but are seldom amongst them.

The next is the 'ground' or 'bearded' seal, so named from being always near the land, and from its magnificent white beard. Its colour is of a dull brown. This is the largest of the seal tribe. Its food consists mostly of prawns.

"The fourth and smallest kind is the 'floe' seal, or

'floe rat,' as the sailors call them. They get their name from the habit of always lying on the field ice, and having holes ready to pop into when alarmed. Their great enemy is the polar bear; they are his principal food. The floe seal is a very pretty little animal; its hair is short, with grey irregular stripes down the back. The young one is not much larger than a soda-water bottle.

"Making the ice from the 15th to 20th of March, as before stated, the ships cruise along its margin, following the well-known rule that if it lies to the eastward of the meridian of Greenwich, in lat. 73 deg. N. the seals will be found to the north of the island of Jan Mayen; but if it is much to the west of this line, the seals will be to the south and west of the island, for reasons which need not here be given.

"Starting with this knowledge, the longitude of the pack is first ascertained before starting to look for the seals. This being found, the ice is taken, and the ships forced through the pack under steam and canvas, very frequently receiving severe shocks, sometimes getting their bows stove in. Every effort must now be used to force the ships through the ice in the desired direction. All hands have often to be on deck to roll the ship from side to side to break the ice down, heaving at windlass and capstan on stout hawsers attached to the ice, using ice-saws to cut, and powder to blast, a passage.

"Fifteen or twenty years ago a pack of seals would have extended in every direction as far as could be seen with a good telescope from a ship's mast-head, lying as close as a flock of sheep, the reflection darkening the sky above them. In those days a ship, falling in amongst them

about the first of April, had no difficulty in getting as many as she could hold. The case is greatly altered now: a pack very rarely exceeds a twentieth part of the above size, owing to the cruel manner in which they have been destroyed.

On the seals being reached, the men are sent over the ice, the harpooners armed with rifles, the other men with seal-clubs, knives, &c., also a rope to drag the skins to the ship, which are allowed to lie on deck until cold, and then put into the tanks. And now a work of brutal murder and cruelty goes on enough to make the hardest-hearted turn away with loathing and disgust. The harpooner chooses a place where a number of young seals are lying, knowing well that the mothers will soon make their appearance to see if the young are safe, and then shoot them without mercy. This sort of work goes on for a few days, until tens of thousands of young ones are left motherless to die of starvation: not so much from the number of old ones killed (although too many of them are slain at this season, forty thousand being killed last year in March) as from those wounded and scared away. In a short time the old ones become shy, and will not come near where men are standing, but keep at a respectful distance. It is horrible to see the young ones trying to suck the carcases of their mothers, their eyes starting out of the sockets, looking the very picture of famine. They crawl over and over them until quite red with blood, poking them with their noses, no doubt wondering why they are not getting their usual food, uttering painful cries the while. The noise they make is something dreadful. If one could imagine himself surrounded by four or five hundred thousand

babies all crying at the pitch of their voices, he would have some idea of it. Their cry is very like an infant's. These motherless seals collect into lots of five or six and crawl about the ice, their heads fast becoming the biggest part of their bodies, searching no doubt to find the nourishment they stand so much in want of. This is indeed a case where the Society for the Prevention of Cruelty to Animals would find full scope for carrying out its benevolent intentions, for there are no greater cruelties perpetrated on the face of the globe than at the Greenland seal fishing.* There is a close time to protect most useful animals, and unless this is extended to the seals in Greenland they will soon be exterminated. The case is different at the Labrador fishing; the seals are not interfered with until the mothers are leaving their young. An international treaty between this country and Norway, these being the two principal nations engaged in this fishery, should be entered into, not to begin fishing until 6th April.

"The females are very affectionate towards their young. It is very amusing to watch the old one coming on to a piece of ice where there are ten or a dozen young ones, going from one to the other until she finds her own, kissing and patting it and teaching it where to go to get a suck. But any of the others had better not venture near; if they do, the old seal will stretch out her neck, give an angry 'wurr,' fly at them, and scratch them with her sharp claws,

* I quite agree with Captain Gray. I really wish the Society would take up the matter. I understand from high authority that it is possible to frame an international treaty for a close time for seals between the nations who send ships to the seal fisheries.

making the fur fly out of them. At other times, seeing men approaching, a mother will occasionally snatch up her young one, dive under the ice with it, and carry it, for the time, out of the reach of danger. The male seals, on the other hand, never lose an opportunity of worrying the young, taking them in their teeth, and shaking them as a terrier dog would a rat.

"In April the young seals are beginning to be better worth taking. The rifles are then laid aside, and every man is employed in killing and flaying the seals, and dragging the skins to the ship. Three thousand is not an unusual number to be slaughtered in a day by a single ship. At this work many of the men do not put themselves to the trouble of carrying clubs, but give the seals a tap on the nose with their foot to stun them, and skin them alive. They have often been seen to try and swim after having their skins taken off. The largest number of seals taken in one season by a single vessel was twenty-three thousand, yielding two hundred and seventy tons of oil, valued at £14,000, more or less, according to the price of produce at the time.

"The young seals having now taken the water and dispersed, which they do very quickly, the operation of 'making off' is commenced; that is, separating the blubber from the skins, putting the former into the tanks and salting part of the latter. Two rows of planks are put up along each side of the deck, waist high, at an angle of twenty degrees from the perpendicular; the skins are laid across these after being 'kranged,' the term used for cutting away any pieces of flesh adhering to the blubber. The skins are then flenched, and the blubber,

cut into long strips, forked down into the hold and put into the tanks. Two thousand skins flenched is considered a good day's work.

"After all the skins are salted down, the ships proceed farther north to hunt up the old seals. These animals go on to the ice about the beginning of May, and will lie for weeks without coming off to feed, if left undisturbed.

"This is for the purpose of starving off the superfluous fat, so that they may be better able to enjoy the warmer weather during summer.

"The seals are now fair game. It requires labour and skill to approach near enough to shoot them, some of them being always on the watch. The best way to get at them is to approach from the lee side, or, if the sun is shining, to keep in his rays. Once within seventy yards or so, if the man is a good shot he ought to be able to kill as many as will load his boat, if the seals are lying well, without changing his position. But few of the men can do this, being indifferent shots, and the seals can only be killed instantly by shooting them through the head. This is necessary, for, if one is wounded, it runs off, alarms the others near, and they follow; whereas, if shot dead, the rest fancy it is lying down to have another sleep, and follow its example. An indifferent shot is a great nuisance to the other men, he scares off so many seals that they have double the work to do. Two thousand old seals is considered a fair season's catch, although double that number are often taken. This fishing is over by the 16th of May, for those who intend to proceed to the whaling. When the seals intend shifting they make a great noise, all giving tongue together

in a kind of 'wurr'; they also do the same before bad weather."

I am glad to be able to add that the question of enforcing a close time for seals is being taken up by our Government, and much correspondence has taken place upon the subject between the Board of Trade and the owners and captains of sealing vessels in Scotland and in Norway. This movement will, I trust, result in some protection being afforded to the breeding and immature seals.

The official correspondence on this matter has been printed by the House of Commons, and published.

On Monday, the 8th of March, 1875, I wrote a letter in the *Times*, fully explaining all the details of the seal question.

THE BLADDER-NOSED SEAL OF THE ARCTIC SEAS.

In 1873, when Captain Gray returned from the Arctic Seas, he kindly brought me two heads of the bladder-nosed seal, which had been simply cut off the animals, with the long skin of the necks adhering to them, and packed in a barrel with salt. After soaking one of them in cold water until the skin became soft, I proceeded to anatomise the bladder portion of the head. Passing the hand up underneath the upper lip, which I partially dissected off, I found that the internal portion consisted simply of a very large cavity. Further dissection showed that this cavity was lined by the ordinary mucous membrane of the nose, and that it had sphincter muscles—*i.e.*, muscles which expand or contract like somewhat similar muscles in the nose of the camel for keeping out sand, or like the nose of the hippopotamus for keeping out the water.

The other head I gave, at Captain Gray's wish, to Professor Flower, at the College of Surgeons. The Professor had already set up the head of a small bladder-nosed seal which had died at the Zoological Gardens. It is beautifully mounted in spirits, showing a section of the bladder. It is very difficult to account for the presence of this sac-

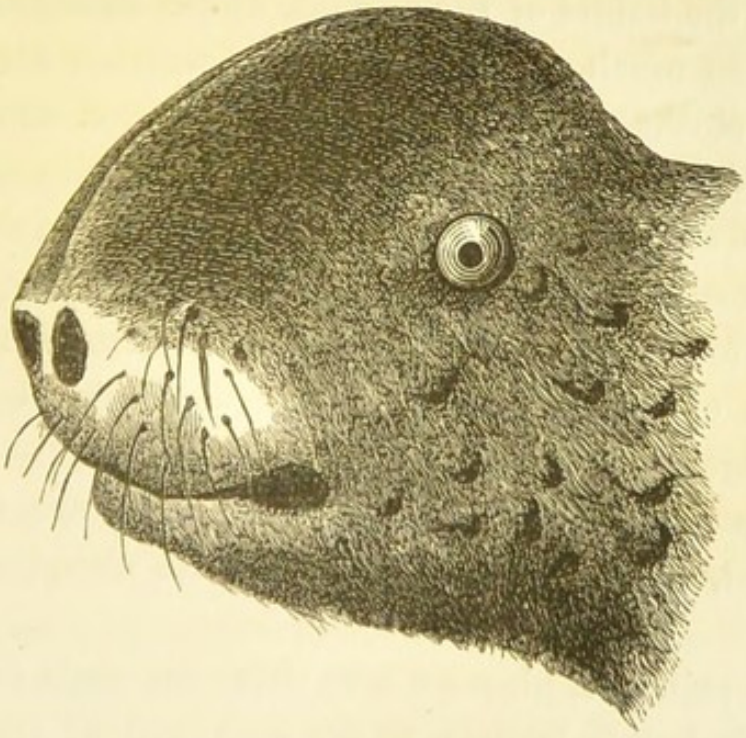
like crest. An American author writes: "The dilatable sac, which comes over the head of the animal, and which, when swollen up, appears like bladders, is covered with short brown hair. The opinion of the fishermen regarding the appendage is that it is a sort of reservoir for air which the animal uses when under water. Its great bulk, however, when distended, would prevent the animal from descending freely, or moving with facility beneath the surface of the water. The connection of the nostrils with the hood, the configuration of this part, and its internal structure, indicate its importance as subsidiary to the sense of smell. The weak arm of offence and defence allotted to this animal renders it necessary that this faculty should be exercised in the greatest possible degree. The hair of its hide is soft and long, and woolly underneath, dark in the old, and grey in the young, covered with irregular brown spots." Against this "air reservoir" theory will have to be urged the fact that this singular appendage is found in the mature males only, and is wholly wanting in the females and the young. It, therefore, is probably simply a sexual ornamentation, as the comb in the cock, the horns of the stag, &c.

It may be possible, reasoning from analogy, that the seal may be able to make a peculiar noise with this sac.

The other day, when at the Zoological Gardens, I was very much struck with the musical note which the female Indian elephant was playing up as she was eating her dinner. She could emit three distinct, long, booming, resounding notes, reminding me of a man tuning the pedal pipes of an organ. The sound was very fine. Will any of our musical friends go and listen to the elephant, and

tell us what notes they are? It may be possible that the bladder-nosed seal can make call-notes—musical or otherwise—especially at breeding-time, like the challenging of the red deer, by means of the curious structure that I have above described.

This fine specimen of the bladder-nosed seal's head is now placed in my museum alongside the formidable seal-club, figured at page 296, used for killing these unfortunate animals for the sake of their oil and skins. Here is a drawing of it.



HEAD OF BLADDER-NOSED SEAL.

A very fine specimen of a Bladder-nosed seal is now at the Zoological Gardens. He was caught by Captain Gray by using a ship's sail as a trap. I have also a cast of a baby bladder-nosed in my museum.

HABITS OF THE FUR SEAL.

I HAVE often been asked by ladies to tell them something of the habits of the animal, whose handsome warm fur they so much appreciate in cold weather when made up into cloaks, hats, muffs, &c. Professor Flower has been kind enough to lend me a most interesting pamphlet on the eared seals (*Otariadæ*), and especially on the habits of the Northern fur seal (*Callorhinus ursinus*), by Charles Bryant, forming No. 1 of vol. ii. of "Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, Mass."*

It appears that these valuable animals are regularly cultivated, instead of an indiscriminate slaughter being allowed.

"The principal places where these fur seals are found, are the Pribyloff Islands, to the westward of Ounalaska. The inhabitants of these islands cultivate the seal diligently, and with a well-ordered system, as will be seen hereafter. The male fur seal, when in his prime, is about six years old, and measures from seven to eight feet long. The breeding grounds are called "rookeries." The seals take up their position on the belt of loose rocks along the

* Cambridge University Press.

shores between the high-water line and the base of the cliffs. Each seal selects a special rock as his own. The young seals are not allowed to land; they swim in the water all day, and at night spread themselves out, like flocks of sheep, to sleep on the shore above the rookeries; going through passes which the other seals allow them to traverse in peace. The old male seals are called 'Seacutch,' the bachelors 'Holluschuck,' and the mothers 'Motku.' The old veteran male seals come first from the sea in the middle of April, and take up their position after a careful *reconnaissance*. All fires in the island are then put out and everything kept as quiet as possible. No human being is allowed to go near the seals' rookery. All the males have arrived about the 15th June, and then the females come, and the family party is complete by the middle of July. Each seal takes from ten to fifteen wives. The males fight most dreadfully, and inflict terrible wounds on each other. The noise of their fighting is like a railway train approaching. None of the seals eat anything during the time they are on the rookeries. The milk of the seal is of a yellowish colour, very insipid, and contains no sugar. The males teach the pups to swim. The cry of the pup is like that of a lamb; the voice of the mother is like the bleating of a sheep.

"When the killing time arrives, a party of men creep quietly between the seals and the shore; they rise up suddenly with a shout, and drive inland all the seals that happen to be inside the line. When out of hearing and sight of the main body of seals, they sort the animals they have cut off, allowing those that are too old to go back again to the sea-shore. They keep only those that

are two or three years old, as they give the best skins. It is necessary to drive the flock some distance from the breeding ground, as the smell of the blood and the carcases disturbs the seals. Another object is to make the *seal carry his own skin* to the salt-house, and it is hence sometimes necessary to drive them six or seven miles. The driving has to be conducted with great care, as the violent exertion causes the seals to heat rapidly, and if heated beyond a certain degree the fur is loosened, and the skin becomes valueless. On a cool day they may be driven a mile and a half per hour with safety.

"They travel by lifting themselves from the ground on their forelegs, and hitching the body after them with a kind of sideways loppeting gallop. A few boys are employed to watch the seals and keep them together, and they are killed, as they are wanted, by a blow on the head. The time required for killing the seals depends on the number of men and workmen available to skin them and prepare their flesh, which is dried and used for the winter food of the islanders.

"Only the males are destroyed for the sake of their skins; the females and animals with bad skins are allowed to escape, to keep up the stock.

"Mr. Bryant makes a calculation as to the number of seals upon the island, and, from data which seem fair enough, he makes out that there are no less than one million one hundred and fifty-two thousand breeding males and females; this is only upon the island of St. Paul's.

"Previous to 1866 the skins were only worth three dollars or 12*s.* 6*d.* each, but when ladies made them

fashionable, the price rose to 7 dollars, or 29*s.* 2*d.* each, in the raw state. The market is now somewhat overstocked, the skins being from three to four dollars, or 16*s.* 8*d.* The agents for the Russian Fur Company are the chief regulators of the supply. The opinion of the men who have the special care of the seals is that about a hundred thousand animals are killed by them every year, and yet owing to the care taken in preservation, there seem to be just as many seals as ever."

This account cannot, I think, fail to be interesting to my readers, especially as we see so many garments made of seal skin just now in the shop windows.

The skins of other animals are often sold as seal skins, and when they are well dyed, to the proper bright mahogany colour, they are difficult to distinguish from the genuine article.

The late Mr. Roberts, furrier, of Regent Street, invented a most excellent plan for getting rid of the loose exterior hairs of the seal skin, leaving the thick fur portion alone.

Formerly the long hairs were pulled out with great expense and trouble. Mr. Roberts found out that the roots of the long hairs were fixed deeper into the skin than the roots of the fur or short hairs. He therefore suggested the following plan; the skin was stretched tightly, with the hair side downwards, on a table. With a sharp cutting instrument, the skin was then pared down till all the roots of the long hair were cut, the roots of the short fur being carefully left intact. The skin being then reversed, the long hairs having no roots could be

simply swept off with the hand, leaving the valuable fur below in a sheet like pure velvet.*

* As regards the general supply of the seals for the London market, Mr. J. H. Ince, furrier, of 75, Oxford Street, has given me the following information :—

"Seal skin has been found to be specially adapted for a climate like that of England, as it naturally offers the best resistance to damp and cold, protecting the invalid and the sportsman alike. In no other part of the world is it brought to such perfection as in this country, through the successful manipulation of the dresser and the dyer ; so that there are some descriptions which can be rendered almost as light and soft in texture as velvet. Unlike other products, the imports of seal-skin do not greatly vary, so that as the demand increases, the prices must necessarily advance ; and probably, not many months hence, seal-skins of the finest quality may be twenty per cent. dearer. At the present time a cloak of the richest fur seal, a yard deep, can be sold for £25. By far the greater number of fur seals, and those of the best description, are brought from the North Pacific in the neighbourhood of Alaska. The annual supply from thence is about 100,000 skins, but it must be remembered that not one-fourth of these are of the finest quality, and, for the purposes of sale, are divided into many portions, those from the large male seal, seven feet in length, to the yearling, or small pup, and from the rich pink wool to the old and grey. A large quantity are annually shipped from here to the United States and elsewhere, so that the proportion of fine skins for home use must continue small. From the Lobos Islands we receive some 20,000 skins annually, but these are of inferior quality. The supply of fur seals from other parts is uncertain ; 2000 or 3000 from the South Sea and Falkland Islands, and 6000 or 8000 from islands off the Cape of Good Hope. The skins coming from Alaska have been known to improve by the long voyage, the wool or fur growing richer, but when carelessly packed the leathers have become tainted, and proved a heavy loss to the merchant : in such cases they are only fit for hatters. It may be interesting to learn that the beaver and the otter can be prepared the same in every respect as the seal, although when not dyed they form the most suitable trimming for seal jackets. The dyeing of all these skins is now brought to great perfection ; we have the golden colour and any shade of brown, from light bronze to nearly black. The above remarks apply simply to fur seals as distinguished from hair-seals, which are chiefly used for leather and military purposes."

In my museum is a very handsome seal skin presented by Mr. Collins, of Finsbury, through Mr. Henry Lee. This skin is so cleverly prepared as to show, in one unbroken hide, the natural state of the fur, as well as three different manners of preparing and colouring the same for ladies' use.

At my Lecture at the Society of Arts, Jan. 1874, on Birds, Beasts and Fishes, I was, through the kindness of my friend, Mr. Nicholay, furrier, of 82, Oxford Street, able to exhibit a magnificent collection of seal skins from all parts of the world. Some of these I consider are the most beautiful animal products known for ladies' dresses.

MY MONKEYS.*

"THE HAG" AND "TINY."

I AM sure that we do not take sufficient notice of what may be called the "mind" of animals. There is something which regulates their actions and thoughts, which is certainly a degree higher than instinct; and it is this peculiar faculty which I am so fond of studying. The monkeys at the Zoological Gardens are very interesting animals; but they are not, so to speak, civilised; they have only their own relatives as associates, and they have not learned the elegances and refinements of polite society, to which monkeys accustomed to the continual company of our noble selves will attain.

I have two little monkeys at home of which I am exceedingly fond. They are really half educated in their way, and are almost fit to go up for a competitive examination. My monkeys' names are "The Hag" and "Tiny." Hag's original name was "Jenny," but she has so much of the character of a disagreeable old woman about her that I call her "The Hag," and she "answers to" that name. Tiny was originally a very little monkey

* This article appeared in *Temple Bar*, Jan. 1868. By the permission of the proprietors I now republish it.

indeed, not much bigger than a large rat. My friend Bartlett brought her to me from the Zoological Gardens as a dead monkey; she was "as good as dead"—a perfect skeleton, and with but little hair on her. She arrived tied up in an old canvas bag. I put her into "The Hag's" cage. The old Lady at once "took to her," and instantly began the office of nurse; she cuddled up poor Tiny in her arms, made faces, and showed her teeth, at anybody who attempted to touch her. Tiny had port-wine negus, quinine wine, beef-tea, egg and milk—in fact, anything she could eat; and "The Hag" always allowed her to have "first pull" at whatever was put into the cage. In time, Tiny, through Mrs. Buckland's good nursing, stood up, then began to run, her hair all came again; and she is now one of the handsomest, most wicked, intelligent, funny little beasts that ever committed an act of theft. Steal? Why, her whole life is devoted to stealing, for the pure love of the thing. The Hag's Latin name is *Cercopithecus petaurista*, or the vaulting monkey. Tiny is a "*Mona*." When pleased her cry is very like the word "mona" prolonged.

Tiny and "The Hag" are dressed like two sisters going to a ball, and it is difficult, for a person who does not know them well, to tell them apart. They are each a little larger than a big guinea-pig, with a long tail. "The Hag" has a green head, a very handsome white beard, with a snow-white spot on her nose, and brilliant lustrous brown eyes; the cheeks are beautifully marked with silk-like black hairs; the ears are well turned, and very small. I put earrings once into "The Hag's" ears, but Tiny pulled them out and crushed them up with her

teeth. On the hair on the top of the head there are markings reminding us of the "plate bonnets" once worn by ladies: the monkeys "wear their own hair," and not chignons. My monkeys are, summer and winter, dressed in seasonable garments: their wardrobe consists of three sets of dresses. 1st. Their common winter dress of thick white flannel, trimmed with red braid, and peg-top sleeves, with large capes: in these they look like the old-fashioned "Charlies," or night-watchmen. Their "second best" dresses are of green baize without capes, made to fit quite tight, like a friar's frock, tied on round the waist by means of a girdle of ornamental ribbon or a patent leather strap.

They never—like the casuals at the workhouse—attempt to tear their dresses off; but it is a great treat for them to be undressed and put before the fire, and have a good scratch, after which their fur is brushed with a soft brush. They very soon come of their own accord to have their clothes put on again; for they are most sensitive to cold. Their best dress for summer evenings, at tea or dessert, when "company is coming," is a green velvet dress, trimmed with gold lace, like the huntsman of the Queen's staghounds.

Under their dresses, their chests are carefully wrapped round with warm flannel, sewed on. In very cold weather they have an extra thickness of flannel. I feel convinced that all valuable monkeys should be dressed in this way, and that this plan should *always* be adopted at the Zoological, especially with the ourangs, chimpanzees, spider monkeys, and other rare and costly specimens.

There is not the slightest suspicion of any parasites, or of any unpleasant smell, about Tiny or "The Hag." They have two cages—a day cage and a night cage. The day cage is a large wire cage, with a rope on which they can swing; the night cage is like a dormouse cage, only, of course, of a larger size. They go into the box at the end, and tumble themselves up in the hay, with which the box is nearly filled. A cover is also put over the cage, to keep them warm all night.

When the fire is lighted in the morning, in my museum, the servant puts the monkeys in their night cage before it, and directly I come down to breakfast I let them out. They are only allowed to be loose in my museum, as they do so much mischief; and in my museum I alone am responsible for the damage they do. The moment the door of the cage is opened they both rush out like rockets, and "The Hag" goes immediately to the fender and warms herself, like a good monkey, as she, being older, seems to know that if she misbehaves herself she will have to be put back into her cage. Tiny, on the contrary, rushes round the room with the velocity of a swallow, and takes observations to see what mischief she can do.

Tiny steals whatever is on the table, and it is great fun to see her snatch off the red herring from the plate and run off with it to the top of the book-shelves. While I am getting my herring, Tiny goes to the breakfast-table again, and, if she can, steals the egg; this she tucks under her arm and bolts away, running on her hind legs. This young lady has of late been rather shy of eggs, as she once stole one that was quite hot, and burnt herself.

She cried out, and "The Hag" left off eating sardines, shook her tail violently, and opened her mouth at me, as much as to say, "You dare hurt my Tiny!" If I keep too sharp a look-out upon Miss Tiny, she will run like a rabbit across the table and upset what she can. She generally tries the sugar first, as she can then steal a bit; or she will just put her hand on the milk-jug and pull it over. If she cannot get at the sugar-basin or milk-jug, she will kick at them with her hind legs—just like a horse—and knock them over as she passes.

Having poured out the tea, I open the *Times* newspaper quite wide, to take a general survey of its contents. If I do not watch her carefully, Tiny goes behind the chair on to the book-shelf, and comes crash, with a Léotard-like jump, into the middle of the *Times*, like a foxhunter charging at a five-barred gate. Of course, she cannot go *through* the *Times;* but she takes her chance of a fall somewhere, and her great aim seems, to perform the double feat of knocking the *Times* out of my hand and upsetting the tea-cup and its contents, or, better still, the tea-pot on to the floor. Lately, I am glad to say, she did not calculate her fall quite right; for she put her foot into the hot tea and stung herself smartly, and this seems to have had the effect of making her more careful for the future. All the day of this misfortune she walked upon her heels, and not upon her toes as usual.

"The Hag" will also steal, but in a more quiet manner. She is especially fond of sardines in oil, and I generally let her steal them, because the oil does her good, though the servants complain of the marks of her oily feet upon the cloth. Sometimes the two make up a

"stealing party." One morning I was in a particular hurry, having to go away on salmon inspection duty by train. I left the breakfast things for a moment, and in an instant Tiny snatched up a broiled leg of pheasant and bolted with it—carried it under her arm round and round the room, after the fashion of the clown in the pantomime. While I was hunting Tiny for my pheasant, "The Hag" bolted with the toast: I could not find time to catch either of the thieves, and so had to go off without any breakfast.

Tiny and "The Hag" sometimes go out stealing together. They climb up my coat and search all the pockets. I generally carry a great many cedar pencils: the monkeys take these out and bite off the cut ends. But the great treat is to pick and pick at the door of a glass cupboard till it is open, then to get in and drink the hair-oil which they know is there.

Any new thing that comes they *must* examine; and when a hamper comes I let the monkeys unpack it, especially if I know it contains game. They pull out the straw a bit at a time, peep under the paper, run off crying, in their own language, "Look out, there's something alive in the basket!"

The performance generally ends by their upsetting the basket, and if they turn out a hare they both set to work and "look fleas" in the hare's fur. I once received a snake in a basket, and let the monkeys unpack it: they have a mortal horror of a snake. When they found out the contents of the hamper, they were off in double-quick time, crying "Murder! thieves!" and it was a long time before they would come down from behind the

cast of a very large Loch Tay salmon on the top of the book-shelves.

It is extraordinary to see the love between these two pretty beasts. Tiny runs directly to "The Hag" if she is in trouble, and "The Hag" seems to know Tiny is the weakest, and must be protected.

In a great measure, Tiny owes her life to "The Hag," for when she was very ill, "The Hag" nursed her like a mother does a baby; but, at the same time, "The Hag" gives her a thrashing now and then to keep her in order; and this castigation consists in hunting her round the cage, and making a scolding noise. If "The Hag" is in earnest, Tiny hides her head in the hay, and waits till "The Hag's" temper is over.

The mischief this bright pair do, *or are said to do*, is appalling. Anyhow, I have tremendous long "Monkey Bills" brought up to me for immediate payment once or twice a week. The damages claimed are for destruction and injury to flowers; bugles and beads torn off bonnets —sometimes alas! whole bonnets; pins broken from brooches; ornaments, &c., taken from tables, that cannot be found; tea-cups, saucers,—saucers and plates without end; tumblers innumerable, &c., &c. After they have by any chance escaped into the bed-room, and had ten minutes there all to themselves, the bill will rival that for the Abyssinian expedition. It is, moreover, very difficult to catch them in the drawing-room or bed-room, because, if hunted, they run over the mantelpiece and side-tables and knock over the ornaments like skittle-balls, and no amount of persuasion will induce them to come and be caught.

One day a scene of havoc was discovered in the bed-room; it was known the culprit was "The Hag," and that she *must* be in the bed-room: the servants were called up and the room searched thoroughly, sofa and other pieces of furniture moved, and the whole place thoroughly examined; still no "Hag" could be found. The hunt was given up, but a strict watch kept. At last, after she knew the hunt was over, and we were waiting for the old lady to come out from somewhere, just the top of her head and her bright eyes were seen in the looking-glass on the table—the original of the reflection being on the top of the great old-fashioned four-post bedstead, crouched down behind the board like a rifleman in a pit, "looking to see how we were looking," and as quiet and noiseless as a marble bust.

When I go to Herne Bay to attend to oyster cultivation, I take the monkeys with me for the benefit of the sea air. I always put up at Mr. Walker's, the confectioner, in the Esplanade. Mrs. Walker is very fond of the "Coloured Ladies," as she calls them, and allows them to take great liberties.

Mrs. Walker is rather proud of the way she dresses her shop-window with cakes, buns, sweet-stuff, &c. One day "The Hag" had crept very quietly into the shop, and was having a "field day" all to herself in the shop-window among the sweets. Mrs. Walker, sitting in the back parlour, was aroused by hearing a crowd of boys laughing outside the window. On coming into the front shop she found "The Hag" all among the cakes, &c., in the window; both her cheek-pouches were as full as ever they could hold of lemon-peel, and she was still munching at

a great lump of it. My lady was sitting on the top of a large cake like a figure on a twelfth-cake. Tiny was not in this bit of mischief for a wonder.

Mrs. Walker declared she would send "The Hag" before my friend, Captain Slark, the chief magistrate of the town, for stealing, and have her locked up for a fortnight; but the thief had first to be caught, and this was a difficult task, for she bolted out into the bakehouse, and upstairs into the loft where the flour is kept. There is a large wooden funnel through which the flour is passed into the bakehouse below. Trying to hide herself from Mrs. Walker, "The Hag" jumped into the open top of it, and, much to his astonishment, lighted on Mr. Walker's head as he was making the bread below: she knew she was all right with Mr. Walker, but she was one mass of flour. Her green baize coat was quite white, and she looked like a miller on a small scale, and the flour could not be brushed out of her for two or three days.

Mr. Walker tied her up, and there she stayed by the warm oven, the rest of the day, chattering and telling him in monkey-language of all her troubles.

The monkeys' principal companions in the house are a very valuable talking parrot and a handsome French Angora cat. Tiny, when loose, renders the lives of these creatures miserable.

The parrot had originally about fourteen handsome red feathers in her tail: *now* she can only muster three feathers. Tiny has pulled all the rest out.

Tiny runs and jumps round and round the cage, and pretends to steal the Indian corn: the poor bird turns round and round, with her feathers all the wrong way,

and pecks at Tiny, fighting her like an old woman up in a corner defends herself from a lot of mischievous, teazing, street boys. While protecting her corn, Polly forgets her tail; and Tiny watches her opportunity and tears out a handful of feathers at a time, and off she goes like a shooting-star. When the cat is asleep in front of the fire, Tiny's great delight is to creep noiselessly up behind and pull the fur out; and, if that does not wake her, she will get the end of her tail in her mouth and give it a bite, and this operation soon starts the cat. The cat is, in spite of the persecution she receives, not bad friends with the monkeys; they will sometimes both go and sit on her back and "look the fleas" in her fur.

The worst of the monkeys is that they have pockets in which to pack away the goods they steal. These pockets consist of a pouch each side of the face. When empty these pouches are not observable, but yet the owners can stow away an immense amount in them. It is great fun to see how much they will hold; and this is done by giving them an unlimited supply of acid drops: they immediately fill their pouches as full as ever they can cram them, and I find they can pack away about twenty acid drops in each pouch. One day several things were missing: at once I thought of the monkeys. I caught them and searched their pouches,—a pretty safe find for stolen goods: in "The Hag's" pouches were a steel thimble, my own gold finger-ring, a pair of pearl sleeve-links, a farthing, a button, a shilling, and a bit of sweet-stuff.

There is no trouble to catch the monkeys. I have only to open the door of their cage, and say, "Cage!

cage! go into your cage! quick march!" and they go in instantly, like the good beasts they really are. The parrot has caught up these words, and when the monkeys are running about often cries out, "Cage! cage! go into your cage!" but the little wretches do not care for old Poll. Luckily, the monkeys are afraid of a stuffed Australian animal that hangs in my room. When I have any specimens or bottles that I do not want the monkeys to touch, I simply set down the "bogie" to act as a sentry, as I know the monkeys will not come near it.

My friend, Bartlett, is greatly amused with the monkeys, and he has put it about among our Zoological friends that when *I* want to be quiet, *I* go into the cage myself and shut the door while the monkeys run loose.

Both monkeys come in to dessert, and get their "monkey's allowance." They will drink wine and spirits: sweetened gin and water is especially a favourite drink. Their great delight is to be near me, one sitting on my knee and the other on my shoulder. I have to keep a sharp look-out, especially on Tiny, as she is particularly fond of watching till a lump of sugar is placed in the grog. She will at once make a jump, alight close to the glass, and put her hand and arm into the glass and steal the half-melted sugar out of the grog.

I fear that if the poor monkeys could read the characters I have given them, they would not be much pleased with me. I must, therefore, say something of their good qualities. They are both very amiable and affectionate, and there is not the least humbug about them. If they steal, it is only because it is their instinct to do so, and for the pure innate love of mischief; and

nobody can blame them. They understand every word I say, but at the same time are occasionally most disobedient. Nay more, they understand my thoughts: one glance at me with their little diamond-bright eyes tells them how far they may go with their teazing me; and when they see I am getting out of temper they will jump into my arms, and chatter and look "Don't be angry with us; it's only our fun!" They even know when I am *thinking* of catching them, and this before I have made the least sign of being about to do so; they then get out of the way in the most cunning manner, sneaking round the furniture, like a fox leaving the covert into which the hounds have just been cheered by the huntsman. At other times, they always scamper about the rooms at a "racing pace." I use the words advisedly, as in their gallop they have the exact action of a racehorse just finishing a race, only that they can pull up short in a moment, and take the most wonderful flying-leaps without changing their pace. Frequently, when they have been hunted into the passage to be caught, and must pass me to get by, they have galloped to within a few inches of my hands, and then, taking a tremendous spring, jumped exactly on to my head, thence slid down my back, and escaped capture.

When I come home in the evening tired from a long day's work, I let out the monkeys, and give them some sweet-stuff I bring home for them. By their affectionate greeting and amusing tricks they make me forget for a while the anxieties and bothers of a very active life. They know perfectly well when I am busy, and they remain quiet and do not teaze me. "The Hag" sits on

the top of my head, and "looks fleas" in my hair, while Tiny tears up with her teeth a thick ball of crumpled paper, the nucleus of which she knows is a sugar-plum, one of a parcel sent by Mrs. Owen, the kind-hearted wife of my friend, Mostyn Owen, of the Dee Salmon Board, and received through the post in due form, directed, "Miss Tiny and Miss Jenny Buckland."

I must now finish the "Memoir," though, if I had time, I could go on writing for a month describing my little pets.

The dear old "Hag" has been my constant companion, living in her cage in front of the fire close to my writing desk, for nearly ten years. I am sorry to say she is now getting aged and infirm. Tiny has been "The Hag's" companion nearly five years. Mrs. Buckland feeds and tends the monkeys with the greatest care, and they are very fond indeed of her. The monkeys owe their good health entirely to Mrs. Buckland.

Although my monkeys do considerable mischief, yet I let them do it. I am amply rewarded by their funny and affectionate ways.

The reader may wonder that I like to keep my monkeys at all in my house; but I *do* like to keep them, and nothing whatever would induce me to part with them.

My monkeys love me, and I love my monkeys.

"The Hag" on Darwin.

"The Hag," who has seen me write so much, has appeared in public as an authoress, and the following is the letter she addressed to *Land and Water*:—

"One evening, as I sat on the edge of the fender warming myself before the fire, I watched my master—who always lets me, if I am good, out of my cage after dinner—reading a book with a green cover. All of a sudden my master put down his cigar; he looked very inquiringly at me, and he then beckoned. 'Come here, Old Hag,' said he; 'quick, dear old girl.' I immediately jumped on to his shoulder with a grunt, took a sip of his gin-and-water to compose my nerves, and then inspected the book. 'Look here, Old Hag,' he said, 'this is page 309 of Mr. Darwin's "Descent of Man," and this is a picture of you.' I looked at it, of course, most attentively. I did not consider it a very flattering likeness: so, as I am not yet sufficiently 'developed' to speak my master's language or to read his books—though I can tear them up, as he well knows,—I asked him in my own language, which he well understands, to read out to me what Mr. Darwin says of me and my family. 'The face of the *Cercopithecus petaurista*'—(my Latin name, you know—though they call me the Old Hag)—'is black, the whiskers and beard being white, with a defined round white spot on the nose, covered with short white hair, which gives to the animal an almost ludicrous aspect.'

"*Ludicrous aspect!* What next, indeed? I shake my tail with rage, I bristle the hair of my head, and show my teeth with indignation at the cat, and my master too, for he is the same species as Mr. Darwin. I am considered by my master, and everybody who sees me, to be exceedingly pretty, and, when my Missis has washed my white beard and white nose, which get dirty from my sitting so much before the fire, to be as handsome a lady

monkey—bar none—as any out of the Zoological Gardens. I have been with my kind master and missis nearly ten years; and now that my face should be called ludicrous! Oh, dear! I will stand no nonsense, so I shall just give you my opinions. I have often thought of writing to *Land and Water*, only I have not got the muscle *opponens pollicis* in my right hand, it is in my foot. What a pity! So I shall dictate to my master what I want to say. I think my master looks much more *ludicrous* than I do. I am pleased to hear, from Mr. Darwin's green book, that he is descended from some of my ancestors, and that he is a near relation of mine. I have examined his ear, and have found in it 'the little blunt point projecting from the inwardly folded margin or helix' (see Darwin, p. 22). There can therefore, of course, be no possible doubt that my master is (as Mr. Darwin gives in his conclusion) descended from 'a hairy quadruped, furnished with a tail and pointed ears, probably arboreal in its habits, and an inhabitant of the old world.' I, the Old Hag, have not got pointed ears, but I have a splendid tail, and I am an inhabitant of the old world. Poor dear master! what a wretched make-up, after all, he is after perfect *me!* I shall order a cage for him, and shall immediately take his chair, and become a candidate for the first vacancy there may be at the nearest School Board. Won't I go in for 'development,' that's all! I see the reader is laughing at my letter. What business has he to laugh at me, the representative of his great-great-great-great—add 1,000,000 more 'greats'—grandmother?

"I will take another point. I knew that my master

was very busy writing his official report on the Scotch Salmon Fisheries, so I watched my chance and bit him through the thick of the muscle of his right hand, making my teeth meet: his hand was closed, more or less, for nearly nine months, so that he could not cast a single fish. I have seen him write with one hand. *I* can use both hands alike: that proves my superiority. He suffered great pain, and as he could not write, he was obliged, like the sailor's parrot who would not speak, 'to think the more.' I am now very sorry for what I did. But, after all, it proves his inferiority to me, for I found he could not bite me in return: of course he could not, his canines are not sufficiently developed, though they might have been so a hundred thousand years ago. The poor man has blunt undeveloped canine teeth: mine are long, sharp, and pointed, like surgical bistouries, and I *can* bite if I like. I only wish Mr. D. would come here and see me, I'd give it him. Now how can you expect my master to give me a return bite in his degenerate state of development? Read your Darwin, ye monkeys, tame and wild, and you will see that I am right. Mr. Darwin says: 'The males alone of the anthropomorphous apes have their canines fully developed; but in the female gorilla, and in a less degree in the female orang, these teeth project considerably beyond the others; therefore the fact that women sometimes have, as I have been assured, considerably projecting canines, is no serious objection to the belief that this occasional great development in man is a case of reversion to an ape-like progenitor.

"'He who rejects with scorn the belief that the shape of his own canines, and their occasional great develop-

ment in other men, are due to our early progenitors having been provided with these formidable weapons, will probably reveal the line of his descent by sneering. For though he no longer intends, nor has the power, to use these teeth as weapons, he will unconsciously retract his 'snarling muscles' (thus named by Sir C. Bell), so as to expose them ready for action, like a dog prepared to fight.' Just so. Let me catch any of the readers of *Land and Water* retracting their 'snarling muscles,' at me, and I will show them that my canines have not been diminished in size or power.

"By the way, my friend and companion Tiny, who lives in the same cage with me, has told me something. We are both Ladies, and of course have private chats together. Tiny says, 'Don't be hard on the master. I will prove Darwin's theory. I have discovered 'Locomotion' all out of my own head. You see we are both in the same boat—*i.e.* cage—and you are too old to be up to any larks; but there is no game that I am not up to. Now you know my master is proud of his sofa-cover; now I want to tear that up, and I am determined to do it. Now, see how I will manage matters. I often shake the cage for amusement and exercise. One day I found that during the shaking process our cage advanced in a particular direction. You, you lazy old thing, will not help me to shake the cage, you only shake your tail, and that's not business, you know. Now I have discovered that I can, by shaking the cage in a particular direction, get it right across the room; and so, as the governor knows, I can shake the cage up to the sofa from the fireplace, some six feet, and can tear up the linings of the

sofa. What did Brunel do half as good as this? I am the originator of locomotion, and you may depend upon it that the creature who designed and built the locomotive engines of the Great Western that take you down to Bristol in three hours, or built the *Great Eastern* ship, was only 'a descendant of a hairy quadruped furnished with a tail and pointed ears, probably arboreal in its habits.'"

The Andaman Monkey.

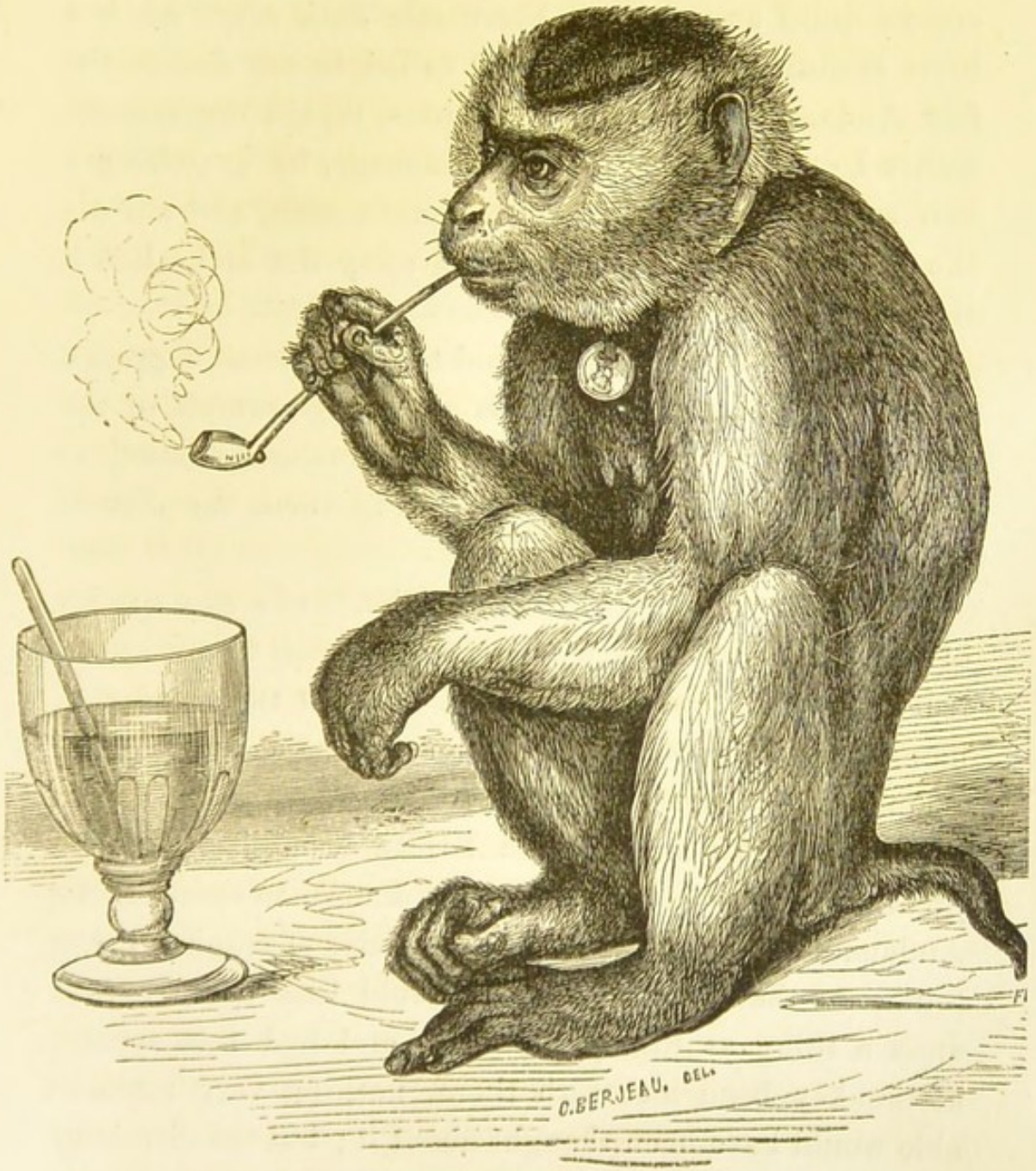
In July, 1869, a new and unique monkey (*Macacus andamanensis*) was presented to the Zoological Society by Captain Brown, R.N., of Her Majesty's ship *Vigilant*. It dates its joining the ship's company, from Port Blair, Andaman Islands, in the Gulf of Bengal, lat. 11° 43′ N., long. 92° 47′ E., in the year 1864. Jenny (for that is her name) is supposed to be eight or nine years old. For the last four years she has "served" on board the ship, and having passed all the dangers of the Abyssinian campaign, and been discharged with a first-class certificate and silver chain and medal for good conduct, is now waiting to receive her share of the prizes taken during the time she was in Her Majesty's service.

Jenny stands about 2 feet 4 inches in height. In general appearance she is most like the "Pig-tailed" monkey (*Macacus nemestrinus*), but is at once distinguished from this species by a remarkable arrangement of the hair on the top of the head, which is somewhat of a V shape, and parted down the middle. The hair itself is very fine, and it is elegantly arranged round the ears. The first impression upon seeing this animal is, that it is intermediate between *Macacus Rhesus* and *Macacus ne-*

mestrinus. The face is by no means fierce, the features may even be called good-natured. She has been made a great pet of by the sailors, the result being that she has been educated to an extraordinary degree of cleverness. She is fond of company, and her constant companion is a chicken (a regular ship-chicken with hardly any feathers), which lives with her in her cage day and night, and accompanies her in her perambulations. She walks upright on her hind legs with remarkable facility, and with much less effort than even the performing monkeys as seen in the London streets. When in an erect attitude she will carry things. Thus she will pick up her chicken and run about with it, holding it in her arms as a nurse does her child: the chicken does not seem to mind this in the least. At the word, "Throw her overboard," Jenny throws the chicken smartly away from her. It has been said that monkeys would talk, but that they know that if they talked they would be made to work. Now the Andamanian Jenny forms an exception to the "working" part (only that is very agreeable work) of the story, for if a soda-water bottle is given her, she will set to work to untwist the wire: this done, she will get out the cork, if it be not too tightly fixed, and then drink the contents of the bottle. Her attitude in drinking is something quite new. She sits down on her haunches, holds the bottle with both hands, and *tilts the end of it up with her hind foot*, so that the liquid shall flow at the proper level into her mouth. In this attitude her appearance is most comical, and at the same time most interesting.

The most extraordinary part of Jenny's performances is that she *smokes a pipe*. Most monkeys will carry a

pipe in their mouth and pretend to smoke; but this is the first monkey that we have ever known actually to smoke



"JENNY," THE ANDAMAN MONKEY.

lighted tobacco out of a pipe. The illustration shows Jenny adorned with her silver collar and war medal, enjoying herself after her day's work. Most monkeys

will drink grog; but Jenny is especially fond of it, and she always takes her glass with her pipe, which she enjoys quite as much as Forecastle Jack after he has been reefing topsails. When I called to see Jenny, the fair Andamanian, devoid of shyness, repaid the compliments I offered her in monkey language, by snatching a half smoked lighted cigar out of my mouth, and did me the honour to finish it, throwing away the end when it threatened to burn her lips.

The Andaman natives are said to be the most degraded of human beings. If Jenny is an average sample of the monkeys of the country I would as soon be a monkey as a man, if nature had cast my lot in these far distant Islands of the Bay of Bengal.

The discovery in the Andaman Islands of a new species of Quadrumana is a very important addition to our knowledge of this interesting country. One or two species of monkeys were known to exist on the adjacent Nicobar Islands, the common Macaque (*M. synomolgus*) being one of them; but, until Captain Brown brought home the present individual, no monkey was known to exist on the Andaman Islands. One or more species of monkey being found on the Nicobar Islands would lead us to expect such a thing as highly probable, and had this species of monkey been met with there, nothing very remarkable would have been thought about it; but the discovery of a species, hitherto unknown, upon the islands that have already furnished us with a man and a pig that are quite unlike any of the neighbouring races, is a circumstance deserving particular attention, and affords material for much speculation and investigation.

Monkey Training.

At the time the Andaman monkey was exhibited at the Zoological Gardens, there lived, in an adjoining cage, a monkey whose history is somewhat remarkable. She was very old, and nearly blind with both eyes from cataract. For very many years she had done good duty as a performing monkey in the London streets, and Mr. Bartlett informs me, on the authority of her owner, that he used to earn as much as £2 or £3 a day with her. When she got so old that she could no longer work, she was sent up to the Gardens to finish the rest of her days in peace.

Every now and then her master had her out again for the purpose of teaching other monkeys. It appears that there is a point at which the human mind cannot reciprocate ideas with the monkey mind. The monkey trainers can teach the monkeys up to a certain point; when that point is reached it becomes absolutely necessary for the man to have, as it were, an interpreter; the monkey-trainer therefore is obliged to send for this old monkey to convey by her actions to his pupils the ideas which he wishes to impress upon them. I once met a man who made a living by training monkeys: he informed me that monkeys differed very much in ability, some learning their tricks much quicker than others; some, too, were so stupid that he was obliged to give them up as a bad job, and to take another monkey of greater natural ability into training. Mr. Bartlett kindly assists the "performing monkey" men by exchanging monkeys that will not learn, for other monkeys which, from their physiognomy, appear likely to become good performers. Some monkeys are clever, some, born fools.

THE BORE ON THE SEVERN.

One afternoon, when spinning along in the Great Western train between Chepstow and Newnham, on my way to examine the Salmon fisheries belonging to the Messrs. Miller, at Chepstow, I was amazed to see the state of the Severn: the river itself seemed to have almost disappeared, enormous sandbanks were everywhere visible, and the main channel was diminished to a small stream so shallow that three fishermen were standing waist deep in it working their lave nets. In the distance I could see figures moving; these also were men (licensed I trust) who were catching salmon in the pools left by the receding water among the sands. At Newnham I went out in Mr. Miller's salmon coble, and assisted in running a shot with the sweep-net across the river. Some boys were bathing on the opposite side to where we were fishing, and a half-grown lad was standing nearly in the centre of the stream.

The reader may say, Yes, but what of all this? Wait, my friend, and see what is coming. From the nets we walked to the top of Newnham hill, whence a magnificent view can be obtained. I asked Mr. Miller why the salmon-boats fishing at the lower shots did not come in? "They

are waiting for the tide," said he, "and we shall have a bore to-night, if I mistake not." Peeping over the edge of the high cliff (which, by the way, although a public walk, has no fencing whatever), I observed that the down-current of the river gradually began to lessen its force; it then became perfectly still, and as calm as a lake, upon which the boats sat as steady and motionless as rocks. In about ten minutes I heard in the far distance a peculiar dull, heavy, rushing sound, but could see nothing.

"The bore is coming now," said Mr. Miller, "we shall have it here very soon." In a few minutes I saw a curved white line, stretched right across the channel, coming round the corner of the river. With a fearful velocity this white line advanced steadily up the river, and as it neared us I saw that it consisted of a wave more than three feet high, curling over with foam at its summit, and forming a distinct wall, reminding me of the pictures that we see of the wall of water forced back when the Israelites made their miraculous passage through the Red Sea. This, then, was "the bore." A truly grand, and almost awful, object it is—its rush might almost be taken as an emblem of velocity, combined with weight and power. The roar that it made was like nothing I had ever heard before, and never before did I so fully understand the meaning of the expression "the voice of many waters." Behind the first wave-wall came a second, then a third, and then the full body of the tide boiling like a cauldron. Behind this, again, swept along a broad sheet of water—the main army of the flood in rear of the advance-guard. The bore rushed past the place where I was watching, with the velocity and rush

of an express train going through a station, and in a few minutes the whole appearance of the river was altered: not an inch of sand could be seen anywhere, but, instead of bare sand, a vast expanse of water reaching from one side to the other. At Newnham the banks of the river are said to be a mile apart. When I was in the boat the river was represented by a channel about the breadth of Regent Street, and nowhere deeper than six feet. Five minutes after the bore had passed this place, the whole extent of the channel was "full up" from side to side. I thought of the poor fishermen that I had seen but lately standing in the bed of the river; I thought of the men hunting the salmon on the sands, and of the boys bathing. If they had forgotten, or not known, that the bore was coming, nothing could have saved them from a sudden and fearful death. I must therefore entreat all our friends who happen to be in this district to be exceedingly careful to inquire into the times and seasons this bore rushes up the river, and never to go on to the Severn sands without a guide.

It was most interesting to watch how the salmon and other boats took the bore. They pulled out into the middle of the river, and waited with the bow of the boat well steadied towards the advancing wave. At the moment, just before the wave touched them, I trembled for their fate—the next instant the wave shot under the keel of the boat—and she took a sudden leap upwards like a rearing horse, then down she went almost bows under; then up again twice, as she crested the two secondary waves that follow the main wave of the bore. She then shot into the boiling water, all hands at the oars, and

pulled away, for a little distance, against the stream. Then she gradually slewed round (like a steamer turning the post at the measured mile on the Maplin Sands), and submitted herself to the full rush of the tide. The men took a dip with the oars every now and then, and she soon got way on her; faster, faster, and faster she went; and now with "all steam up," she rushed past us like a gull, scudding down the wind, with outspread wings. Some scene of this kind must have been witnessed by Job, or otherwise he never could have written the following "prose poetry:"—"They are passed away as the swift ships; as the eagle that hasteth to the prey."

One of the salmon-boats had not calculated her time properly; she came up *in front* of the bore; as the wave advanced it made the water in front of it recede, as men recede when a Life Guardsman's charger is made to "shoulder in" upon a dense crowd of human beings. The men in the boat evidently wished themselves behind, —not in front of the wheels of the chariot of the water king, who was racing up with his foaming steeds. They pulled their hardest, but what human arms can contend against nature's race-horses: the bore caught them; up went the stern of the boat, while her head dipped down like a diving porpoise; as quick as thought she righted herself, and away she went at full speed, riding lightly upon the wave-top, like a stormy petrel upon the summit of an Atlantic roller. Several boats passed up-stream with the bore; among them I observed Mr. Miller's private boat with three young gentlemen in it. They seemed to enjoy the fun amazingly; and no doubt the sensation of being carried along by the bore is most

delightful *after* your boat has made its leap up on to the crest of the wave.

The bore I saw, Mr. Miller informed me, was but a small bore. It often runs up with a wave six feet high, and on some occasions the wave is known to go very much higher than this. The bores, I understand, occur more or less at every spring-tide. The highest bores are what they call the "Palm Tides" in the month of March. The wave, I understand, attains its greatest height just below Gloucester, and one of the best places to see it is from the banks near Elmore, a few miles from Gloucester. Newnham is also a capital place; the view of the bore as it approaches this place is very fine.

The barges which navigate the Severn find the bore very useful in assisting them in making their upward passage, and I have been told of an instance of a barge having run up with the bore from the mouth of the Bristol river nearly to Gloucester.

The barges at anchor are careful to have their anchor tackle right when the bore is expected, and although the bore can be heard coming from a great distance, the bargemen give notice of its proximity by shouting "Flood, oh!" This watchword is passed up the river as occasion serves. In going down the river the barges frequently "miss stays" and get aground on the sands, and are left high and dry by the receding waters. As they are flat-bottomed boats they do not sink into it as a keeled vessel would; sometimes, however, they are apt to "sulk," and sink so deeply into the sand that when the tide rises they do not "lift" to it, and the waves go over them. When this is likely to occur, the men ram in straw between the

barge and the sand so as to allow the water to percolate into it, and so assist her in lifting when the rise of water takes place.

In March, 1874, I again witnessed "the Bore" running up the Severn. The *Times* was good enough to publish the following letter from me :—

A most remarkable natural phenomenon was observed yesterday morning, Friday, March 20. A gigantic tidal wave called "the Bore" made its expected appearance, accompanied by an unusually high tide, in the Severn. Anxious to see if the salmon fisheries would be affected by it, I, in company with Messrs. Cadle and Bennett, of Westbury-on-Severn, members of the Board of Salmon Conservators, and the Rev. the Vicar of the parish, waited the arrival of the Bore at Denny Rocks, five miles below Gloucester. At 9.20 a.m. some boys perched high in a tree shouted out the warning, "Flood O!" "Flood O!" and then, to a minute of her time, up came the Bore, sweeping with a magnificent curve round a bend in the river. Hurrying towards us with fearful force, there rushed a dense wall of water, curling over with foam at its summit, and extending right across from bank to bank.

As the wave approached nearer, and nearer, the "voice of many waters," accompanied by a strange and sudden blast of cold wind, was truly awe-inspiring. In an instant the Bore swept past us with a mighty rush and the whirl of a thousand Derbys passing the grand stand. Two angry precipices of water, the escorts on either side of this terrible wave, swept with terrific weight and power along the banks, throwing high up into the air, and well

above the pollard trees, a sheet of water mixed with mud and sticks. We all cheered the Bore as she passed, so grandly were Nature's racehorses running their course. In a few moments after the Bore had passed, the river, which had been rather low before, was 'brim full to overflow' from bank to bank, and, having previously taken marks, I ascertained that the sudden rise of the water was between eleven and twelve feet. An old man told me that this was as good a head as he had seen for forty years. The tide following the Bore rose with great rapidity, and flooded the fields and roads far and near.

It was most interesting to see a barge plunge up like a rearing horse to take the Bore, while some frightened ducks swam out into the river and topped the wave in a most graceful manner.

The illustration in the frontispiece gives a very good idea of the Bore as she passes Denny Rocks.

I have had a third opportunity of inspecting the Bore, and published the following in the *Daily News* :—

I was due at Lydney, below Gloucester, at midday on Monday, October 26, 1874, to hold an official inquiry on the Severn bye-laws. On Monday morning I determined to go from Gloucester and inspect the fish-pass which Mr. Williams, engineer to the Severn Navigation Commissioners, has erected under a clause of the Salmon Fishery Acts, at the side of the navigation weir lately erected at Maisemore. I walked from the road on to the top of the high bank, and had just time to catch one look at the pass, when, to my amazement and delight, up came a tremendous wave, racing up stream at a furious pace, and in an instant the weir was invisible. A great solid mass

of water covered it over and buried it deep out of sight in a moment.

This, then, was my old friend the Severn Bore. I had not the least idea the Bore was due at that time, or I should have looked out for him. It was, however, very lucky that I arrived at the weir when I did, for if I had arrived five minutes earlier I should certainly have been either standing on the weir or else in the hollow under the cliff, and the weir being situated in a lone place, the Bore might have caught me in a trap, particularly as the mud banks at this place are very steep and very slippery. I watched the ocean of water coming up for about a quarter of an hour; it brought up with it an immense quantity of wreck of all sorts, and pummelled the bank on the right side of the river so hard that at a big bend where I stood overlooking a regular Scylla and Charybdis were formed. The lock-keeper told me that sometimes the Bore came up so heavy that there were great wave the size of sea breakers on the up stream side of the weir. It was most interesting to see the stream in the Severn running *backwards;* and this even though a heavy fresh, coming down from the upper country, had to be forced back by the ascending tidal wave—for the Bore is really a gigantic tidal wave. As I stood watching, up came the tidal flood, and in ten minutes there was no trace whatever of the existence of the weir, except every now and then a slight boil in the water.

The next morning I determined again to pay my respects to the Bore before leaving for London by the morning Express. I chose this time a new place for my observatory—viz., the navigation lock close to the new

weir at Llanthony—a short distance from the upper entrance of the Gloucester and Berkeley Canal. The first thing I saw was the big wave, about a quarter of a mile off, tumbling and rolling about at a terrific pace, sending the sticks and mud flying well over the bank on each side of him. On he came. "Now then, my boys," I cried, "look out, see what he does when he comes to the nose of the island"—we were standing on the nose. The Bore hardly attempted to scale the nose of the island; he seemed to know it was no good, but he cut himself right in two. There was a momentary lull, and then one of his divided streams, gathering itself together, went smack bang at the lock-gates. Having about forty yards good run at them, Mr. Bore did not knock at the gates in a polite manner; he simply went straight at them with all his awful force. In the twinkling of an eye the lock-gates flew wide open, as though blasted by a ton of gunpowder, and as they rattled against the brick walls of the lock they vibrated and shook as though trembling with fear, reminding me of the old Homeric description of how an ancient armour-clad Trojan hero fell smitten with the spear of Achilles:

"Down he fell with a crash, and his arms they rattled about him."

Throwing aside the lock-gates with his mighty arms, the Bore, paying no toll, charged bang through the lock and away, away, away as though racing for life.

The moment the Bore was through the lock I ran across to see him take the weir. Now this weir is built diagonally across a large pool, which is narrow at the upper, and wider at the lower, side. As I stated, the nose of the island cut the Bore in half: one half charged

through the lock, the other half went round the other side of the island. I was just in time to see him approach the weir. The poor Bore was evidently a little puzzled about the road, particularly as, the river being wide at this part, the foremost waves of his line could not keep their dressing properly. The commanding officer did not, however, take long to make up his mind; he seems to have trumpeted the order, "Take open order; right wheel; charge." The waves at the bend of the current seemed to accumulate in a deep pool, while the waves at the outer end wheeled at a swift gallop round the outer curve of the river's course. Away they went crushing into the willow banks, bending the willows down to the bank with the force of the rush and the weight of the accompanying mud storm, and then the word seems to have been given, as in a cavalry charge, "Steady men. Form line on the pivot flank. Trot; gallop; charge." I ran up the bank as hard as I could, to find that the Bore had again united his broken forces, and was tearing away up stream, not so much, now, in a head, as with a series of great undulating waves, which in a few yards' run would have again formed a white-capped, fearful-looking wave. This wave would, about a mile above, have joined with another wing of the Bore's forces that had been obliged to rush up on the east side of the great island which divides the Severn into two channels as it passes near Gloucester. The forces thus joined would have rushed on over Tewkesbury Weir, till at last, the Bore, I understood, would have expended himself at or about Diglis Weir near Worcester.

I marked the height of the water by the figures at the

Llanthony Lock-gates before the Bore came. The mark was XI. One minute after he was past I could hardly see the figures XVI.; so that his height at this point must have been about five feet. In about five minutes my attention was called to the fact that the water was suddenly sinking; and, sure enough, down it went about four inches, with a steady drop. In a few minutes, up it went again, and this time about three inches over the figures XVI. The lock-keeper told me that there were *three bores* at his lock:—No. 1, the great Bore—this is the water that had rushed through the deep channels in the estuary below; No. 2, a smaller Bore that had been retarded by the passage over the wide and shallow sands between the sea and Newnham; and No. 3, a Bore which had run up the channel, on the west side of the big island, in which Maisemore Weir is built, and for some reason invariably came back to Llanthony with a rebound. There cannot be a better place to study the Severn Bore than Llanthony Weir.

These Bores occur at every spring tide, though it is only occasionally that they are to be seen to perfection: the large Bores are generally succeeded by several more, each less powerful and grand than the others.

The night Bores are said always to be higher, heavier, and to make a greater noise, than the day Bores. It was quite by good luck that I discovered that this big bore was due on 26th October, 1874. I am sorry nobody told me it was due, as I should certainly have given public notice, for I am sure many of my countrymen would have liked to have witnessed this the greatest natural phenomenon in the British Islands.

The bore in the river Severn is caused by the peculiar formation of its estuary. In that most interesting and valuable work, the "Geological Observer," by the eminent and lamented Sir Henry De la Beche, will be found the explanation of the cause of the bore. Sir Henry tells us that the great tidal wave coming from the Atlantic is narrowed by the local conditions of the Bristol Channel. From the decrease in the width and depth of the channel, which may be said to be funnel-shaped, and the weight of the Atlantic behind pushing the tide forward, the elevation of water is increased, and the bore thus formed, runs up the river. If the wind blows in the same direction with the tide, the size of the wave is much increased, or to put it in the words of a facetious friend, in order to have a good Bore it must be accompanied by a *sow*-wester.

A heavy Bore also runs up the estuary of the Solway. A Bore also sometimes appears on the Humber, where it is called the "Eagre," or "Hygre." My friend and colleague, Mr. Spencer Walpole, was once caught by the Humber Bore.

On the 12th April, 1868, a huge bore came unexpectedly in from the sea at Axminster, in Devonshire. When surveying the estuary of the river Axe, in company with the Chairman of the Axe Salmon Fishery District, Mr. W. T. Hallett, of Stedcombe House, I observed that the entrance to the river was blocked up to a great extent by an enormous accumulation of shingle. I was told that in April a most remarkable wave came in suddenly from the open sea. The sea had been previously perfectly calm, and there was no wind whatever; the water must have risen *suddenly*, as far as I could

make out, at least twenty or thirty feet. Mr. Beard, foreman to Mr. Hallett, gave me the following particulars :—

"The first ground-sea was seen on 12th April, 1868, about three or four miles out at sea; it reached the shore about half-past four o'clock, P.M., and continued till nine o'clock. About eight o'clock, just at the turn of tide, it was tremendous."

None of the newspapers appear to have noticed this phenomenon at all. Some time since I heard of some unfortunate bathers on the coast of Spain being suddenly swept away by a heavy sea; and I have heard of a wave which sometimes suddenly appears on the west coast of Ireland, and which is called the "death-wave." The late Mr. George Ffennell told me he had heard of people meeting their deaths through it. I examined the coast round the mouth of the river Axe, to see if the wave could have been of the nature of a "bore," as is found in the estuary of the Severn, but the conformation of the coast will not admit of this idea. I conclude, therefore, that it must have been an earthquake wave. Sir H. De La Beche writes :—

"The 'great sea-wave' produced by earthquakes sometimes aids materially in the modification of the coasts shaken, seizing and transporting before it masses of matter which could not be moved under ordinary circumstances, and tearing up deposits thrown down in, or raised to, shallow situations. . . . In the Jamaica earthquake of 1692, 'a heavy rolling sea' followed the shock at Port Royal, and the 'Swan' frigate, which was by the wharf, careening, was borne by it over the tops of houses, and some hundreds of persons escaped by clinging to the ship. The sea-wave of the Lisbon earthquake of 1755, rose to the height of forty feet in the Tagus, leaving the bar dry as it rolled inwards, followed by others, each less in importance, until the water again returned to its ordinary repose. The sea-wave of the same shock was 60 feet high

at Cadiz, 18 feet at Madeira, and, under modified conditions, was felt on the coast of Great Britain and Ireland, rising 8 to 10 feet on the coast of Cornwall. . . . The coasts of Chili and Peru have suffered from similar waves ; in the Calabrian earthquake of 1783, the shore of Scilla was inundated by one, rushing 20 feet high over the low grounds. Such waves are indeed sufficiently common, though seldom prominently noticed unless productive of considerable effects. The sudden rise and fall of the sea observed in so many harbours of the world, as well in tidal as tideless seas, evidently independent of the tides in the former, and not due to wind-wave undulations prolonged to the shores, often seem little else than the continuation of those waves reaching coasts where the earthquake itself has not been noticed."

I give another well authenticated case of a great sea-wave. Mr. D. G. Bruce Gardyne writes me as follows :—

"In the autumn of 1866, the keeper of the lighthouse near Tobermory, in the Sound of Mull, favoured me with some of his reminiscences of Skerryvore, where he was stationed before he came to Mull. He spoke of a bright clear Sunday morning, when, as it was low tide, and the top of the rock was above water, he went down the ladder to smoke his pipe, for once in a way, on dry land. When at the bottom of the ladder, he found he had left his matches behind him. As he was returning up the ladder, he saw a big wave coming. He steadied himself as well as he could, and clung like grim death to the ladder, which fortunately was a fixture. The wave came and swept his legs from beneath him, but he held on, and the wave passed away. The mark on the lighthouse showed (if I remember right) that two-and-twenty feet of water had passed thus suddenly over the rock. The wave gave no notice of its approach."

Being anxious to find out the meaning of the word Bore, and learn more about it, I requested the opinions

of correspondents in *Land and Water*, and the following notes were kindly sent me:—

"A remarkable 'Eagre,' in the Witham, in the year 1571, is the subject of one of the most perfect poems in the language, by Jean Ingelow. If not familiar with it, you will thank me, I am sure, for giving you a new pleasure in its perusal. The scene of this is Boston, in Lincolnshire, where the tide of Friday last was, I believe, extremely high, but not, so far as I can gather, a true 'eygre.'—Rev. H. ANDERS."

> "'Lo! along the river's bed,
> A mighty eygre reared its crest,
> And uppe the Lindis raging sped.
> It swept with thunderous noises loud;
> Shaped like a curling snow-white cloud,
> Or like a demon in a shroud.
> And rearing Lindis backward pressed,
> Shook all her trembling banks amaine;
> Then madly at the Eygre's breast
> Flung up her weltering walls again.
> Then banks came down with ruin and rout,
> Then beaten foam flew round about,
> Then all the mighty floods were out,
> So farre, so fast, the eygre drove,
> The heart had hardly time to beat,
> Before a shallow seething wave
> Sobbed in the grasses at our feet;
> The feet had hardly time to flee
> Before it brake against the knee,
> And all the world was in the sea.'"

"I see that you ask for the origin of the word 'bore.' We have the same phenomenon in the Hooghly, and, I believe, in many other Indian rivers; the word used in the north of India would be Bàrh, a flood. In the south and west the word would be, 'Poor,' a flood. Both these

words are of Sanscrit origin. Kindly let me know if this idea of mine should be confirmed by any authority.—G. Crossmaker, Capt., Guildford."

"The phenomenon of the Bore is seen in the river Seine; and the first time I was in France, nearly thirty years ago, going by the steamer from Havre to Rouen, I purchased on board a little book giving local information, and, amongst other things, relating the effect of a high spring tide in that river. There I found it is called the 'Barre,' which, I believe, signifies 'the dash of a wave.' As the people on the west side are of Norman descent, may not this be the origin of the term? On the banks of the river Trent it is called the 'Eagre,' which, as the people thereabouts are descended from Danes, Belgians, and Dutch, may have come across the German Ocean.—J. W. P."

"Is not the 'Bore' the local name on the Hooghly for the phenomenon described by you, or rather the Anglicised form of the Indian word? Geographical books, and sailors from Calcutta, have given me that impression. Bailey and Johnson know of no such word. Richardson can find no earlier authority for it than two passages in the speeches of Burke, who loved to draw upon the wonders of the East for his similes. The Anglo-Saxon 'borian' is only quoted by Richardson as the equivalent of 'bore, to make a hole.' On the other hand, 'higra,' 'eygre,' and 'eagre,' are old English words. Bailey has 'higra, the raging of the River Severn below Gloucester.' Dryden introduces an 'eygre' into one of his poems, and describes it in a note. Dr. Donaldson, in his 'Varronianus,' connects both 'bore' (boar) and 'hygre' with

other words in which the breaking crest of a high wave, the surf on a rock or sandbank, and other concealed ridges or swellings, are somehow or other supposed to be related to the maned edge of a hog's back, (surf, scruff, scrofa, scrofula, scropulus, rupes, etc.), but whether later photologists accept the idea I know not.—CHARLES J. GEDGE, Bury Herald, Bury St. Edmunds."

"I venture to give you a guess at the derivation of the term 'bore,' as I was struck by the German word for boar, and the fact of this wave, the 'bore,' being, as you rightly say, called the 'eagre,' in some counties of England. The German word for a wild boar is 'eger,' the first E of which is, however, pronounced like A in English. Do you not think there is a plausible connection between the two words, both of which are suggested, perhaps, by the formation of the wave, *i.e.*, like a boar's back. I have never seen the wave, but have often thought that there must be some truth in my idea.—J. ROBERTSON, Hatton Court, Threadneedle Street."

"May I venture to make a suggestion about the word bore? Shall we not find its meaning by going a little further back than the Saxons? The Celtic varieties of the word "Great," in the forms of *vawr* and *mor* seem to point to 'bore' as having a similar meaning, the *v* and *b* being usually interchangeable.—ELEANOR HERVEY, Ramsgate."

"I wondered that you did not give us the height of the rise of the tide on that day from low-water mark at some places on the Severn, and particularly in the Wye at Chepstow-bridge. I remember a record on a stone in that bridge of a rise of tide of 64ft. from low-water

mark. It would be interesting to know what was the rise in the late tide. I wish you would, in a supplementary letter, give the world these facts. It would be very interesting if some first-rate astronomer would give the world a clear scientific account of this tide in all its bearings, giving the position and distances of the sun and moon from the earth and each other, the effect of wind, and other causes.—R. B. BELDOME, 27, Nicholas Lane, City."

"I think you may like to know that the 'bore' on the Mersey is larger and more frequently seen than the 'bore' on the Humber, and is, I am told, second only to that on the Severn.—L. B. W."

"Surely the derivative of the 'bore' is from 'Boreas' —North wind:

"'Boreas and Caecas and Argestas loud,
And Thrascias rend the woods, and seas upturn.'—MILTON.

"'Crete's ample fields diminish to our eye,
Before the boreal blasts the vessels fly.'—POPE.

The tide in Bay of Fundy comes in nine to twelve feet high. All vessels not anchored with their heads to it are smashed to atoms. The people drive stakes into the mud close to low-water mark, and close together, and the fish are left behind them; three tons in weight are caught, wire also being used as net-work, attached to the posts.—F. S."

"The account of your experience of the 'Severn Bore,' which appeared in the *Daily News*, interested me and my friends very much. Although I have calculated the times and heights of the tides at some of the principal sea-ports for many years, I have never happened to see

the 'bore;' but several of us have arranged to make a trip on purpose next April (7th, 1875), when I predict a *grand bore*, the tide rising to nearly 34ft. above the sill of the Cumberland Dock, at Bristol. I enclose for your acceptance a copy of my Annual. I am told by harbour officials at the various ports that these tables are more reliable than any issued, even more so than the Admiralty tables.—SAMUEL R. TOWNSHEND, Stationer, Liverpool."

"The size of the 'bore' at Newnham greatly depends on the position of the sands below, at a point called the 'Noose.' When it happens that the low-water channel lies round the Frampton side, and the Noose sand is high, so that the tide has a long roundabout course to go, then there is always a very big 'bore' at Newnham in spring tides. I think it is mainly caused by the great body of water being for a time kept back by the Noose sands, till, rising higher, it suddenly bounds over, and joins the current on the Frampton side, at a place called Hock Cut, both currents, after meeting in wild confusion, sweeping up the river with renewed vengeance. Should there be a low-water channel through the Noose sands, close to the Aivre side, then there is rarely a 'bore' of any size at Newnham, the tide having a straight course upward. It is always in a freshet season that the Channel cuts down the Frampton side; and in a dry summer the up flood tide cuts a low way in the Aivre shore, through the Noose. There is no 'bore' takes place in the Severn below Shapness point (except on very rare occasions), and it is not of much size till it gets up in the Frampton Channel. The tidal portion of the Severn flows through a very low flat country, and the rise of the tide in the

Bristol Channel is so extraordinarily fast that it will have begun ebbing at Kingroad before it reaches Newnham; and, as it only flows one hour and twenty minutes at Newnham, where the river is about three quarters of a mile wide, and rises sometimes nearly twenty feet, you can have some idea of the strength of the tide. That same tide, after passing Newnham, may flow nearly to Worcester, a distance little short of forty miles, thus showing what an immense force it has with it to flow such a long way up the country—JAMES MILLER, Junr., Salmon Fishery, Newnham."

Mr. Marrico, of Newcastle, wrote me thus, 27th April, 1874:—

"I send you a paragraph from the *Newcastle Chronicle*, of April 20th, giving an account of a supposed tidal wave at Tynemouth on the 19th April, 1874. I was on the cliff about two miles north at the time, and after looking at the pier with our race glasses, we thought there was a swell on, worth walking down to see. The sea was almost calm, with long swells rolling slowly in, and breaking with tremendous force on the cliffs north of Tynemouth, sending the spray right over them more than once. At Tynemouth, however, there seems to have been only this *one* wave, concerning which the paper says:—

"'Last night, about half-past five o'clock, a most extraordinary and appalling accident occurred on the North Pier, at Tynemouth. During the day the sea had been calm, with the exception that wreaths of sea came rolling in upon the North Pier every now and then in a remarkable and unexpected manner, but without causing much alarm. It was high water about half-past five o'clock,

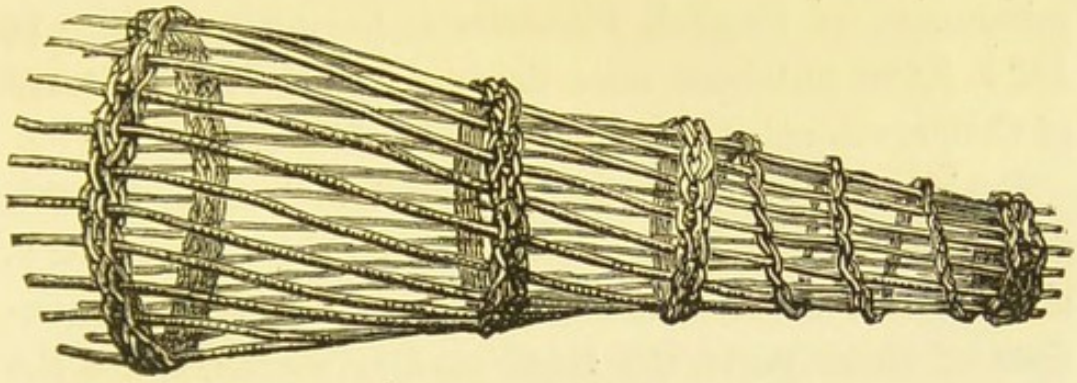
but the sea was then comparatively tranquil. People were promenading on the pier in apparent safety, when suddenly a huge tidal wave broke over it without warning, which caused great alarm. Those who were walking at the far-end of the promenade were driven either between the rails at the side or on to the waggon-way beneath. Three persons—a gentleman and two ladies—were very badly hurt. Such an accident as this has not occurred at Tynemouth within the recollection of the oldest resident. There must have been a heavy storm many leagues away in mid-ocean, and the waves have reached our shores, in a calm, to spend themselves upon them with their destructive force.'"

"As to the derivation of the word 'bore,' I have been told that it meant a cross, but I cannot trace the source of the information. The Saxon is *borian*, but this appears to me so very near the Latin, *Boreas*, and Greek, *βορεας* (the north wind), that I cannot but think the tradition must have an origin apart from Saxon.—William A. Scott, Westbury on Severn."

Before concluding this article on the Estuary of the Severn, I beg to call the attention of my readers to a curious mode of catching salmon, adopted by the riparian owners of fisheries. The visitor will observe, in the lower estuary, stretching for a considerable distance into the water from the muddy banks, rude piers made entirely of wickerwork, which look like large eel baskets; these are called "ranks" of "putchers." Each putcher is about 5 feet 6 inches long, and 21 inches across the mouth.

A framework is made by driving stakes into the mud,

and the putchers are then fastened together in rows one above the other, often to the height of ten feet or more;



SALMON PUTCHER AS USED IN THE ESTUARY OF THE SEVERN.

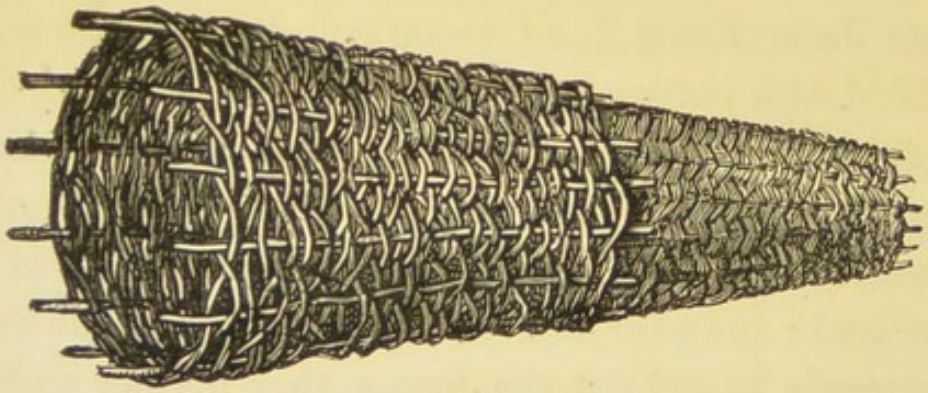
these great walls of baskets look not unlike, as my friend the late John Keast Lord remarked, "a gigantic wine-rack filled with bottles encased in wickerwork."

As the salmon come along with the tide, in the thick muddy Severn water, they run their noses into the open mouth of the putchers, and speedily get jammed up at the narrow end; the poor things cannot turn, and the more they struggle to get out, the firmer they become wedged in; as the tide recedes they are left high and dry. I have often observed that wasps wait about till the tide goes down, and then take first cut at the salmon.

This mode of fishing, is, I believe, the most ancient in England, and it was doubtless first invented and practised, some two thousand years ago, by the ancient Britons, who, as we know, were very clever at basket work. A great many first-class Severn salmon are caught in these putchers and sent to the London market. Should any one wish to examine these ranks of putchers closely, they have only to apply to my friend Mr. Alexander Miller,

the lessee of the Duke of Beaufort's fishery, who resides near the iron railway bridge at Chepstow. Many of these putchers have been abolished by the Special Commissioners of English Fisheries as having no title. In 1874, 5,280 putchers were licensed by the Severn Board of Conservators, at the rate of £1 for fifty putchers.

Besides the putchers, another kind of basket is used, called putts. It will be observed that the wickerwork is much closer in this case than the other; the putt consists of three parts, the large part or mouth, called the putt; the middle, called the butt; and the small end, or bag, called the firwell. Each part is made of smaller



SALMON PUTT.

wickerwork than the other: the engraving represents the "putt" and the "butt," without the "firwell." The diameter of the opening is about 5 feet, and the length from 12 to 13 feet; they are used to catch flat fish, &c. Of these, in 1874, 255 were licensed by the Board at 2*s*. 6*d*. each.

My late lamented friend, Mr. Lord, told me that baskets, similar to the putts and putchers of the Severn estuary, are used at the present day by the Indians of North Western America.

TITLES OF DUMMY BOOKS FOR A LIBRARY.

When lately staying at the hospitable mansion of my friend, Mr. Higford Burr, Aldermaston Park, Reading, I got up early to look over the books in the library, always a great treat to me. As I passed down the shelves, I suddenly came to a series of books which, I confess, I had never seen before, and the titles of which very much astonished me. The books were admirably placed among the other volumes, so that the deception was complete. By the permission of Mr. Burr, I am able to give some of the titles :—

"Farmer's Manual," by Virgil.

"Geology of the Moon," Two Vols.

"The Lost Books of the Sybil."

"Plans and Elevations of the Tower of Babel," Two Vols.

"Tour in the British Islands," by Julius Cæsar.

"Secret Memoirs of the Court of Troy."

"Solon's Geography of America."

"Logbook of the Ark."

"Sections of the Trojan Horse."

"Horace, on the Salt Mines of Africa."

"Archimedes, on the Steam Engine."

"Samson, on Fox-Hunting."

"The Rape of the Lock," by Hobbs.

"Ministerial Papers during the reigns of Augustus and Tiberius," Six Volumes.

"Empedocles, on Volcanoes."

"Orations on the Sea-shore," by Demosthenes.

"History of the Winged Hat of Mercury."

"Belshazzar, on Unknown Characters."

"Nero, on the Violin."

"Calliope, on Poetry," &c.

While I was still in a state of astonishment, the Squire came into the room, and laughed heartily at the new literary victim he had caught wondering at the backs of the books, which formed "dummies" to conceal a door opening out among the book-shelves.

My friend, Henry Lee, wrote subsequently in *Land and Water*:—"I can supplement Mr. Buckland's list of the 'dummies' in the library of Mr. Higford Burr, with the following imaginary titles of volumes proposed by Hood to be painted on a false door in the library of the Duke of Devonshire, at Chatsworth:—

"On the Quadrature of the Circle; or, Squaring in the Ring," by D. Mendoza.

"Dante's Inferno; or, The Description of Van Diemen's Land."

"Lamb, on the Death of Wolfe."

"Malthus' Attack of Infantry."

"McAdam's Views in Rhodes."

"Earl Grey on Early Rising."

"Memoirs of Mrs. Mountain," by Ben Lomond.

"Boyle on Steam."

"On Sore Throats, and the Migration of the Swallow," by J. Abernethy.

"Pul on Bell's System."

"Johnson's Contradictionary."

"Shelley's Conchology."

"Recollections of Banister," by Lord Stair.

"Wykehamist," then kindly wrote:—"I see that you have given some lists of the names of 'dummy books.' If you wish to continue the subject you had better go at once to Rabelais, the great storehouse of wit, from whom the humorists of the last few centuries have constantly helped themselves, and who wrote just such a list as you want."

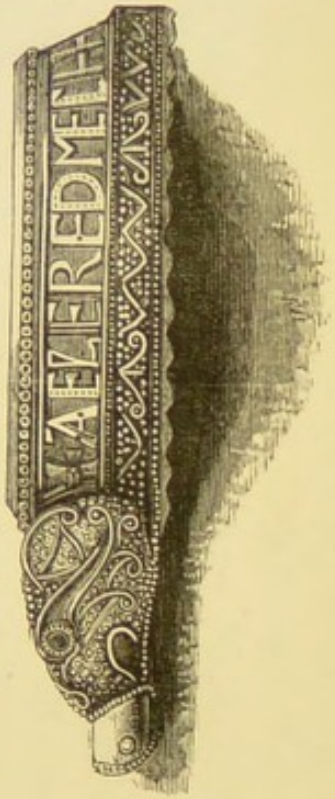
ANTIQUITIES.

King Alfred's Jewel.

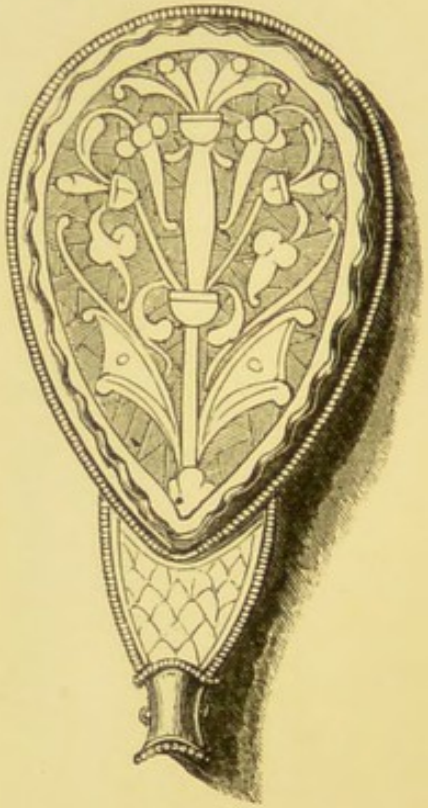
When a lad, I spent many of my holidays from Winchester School with my relations, the Rev. B. Morland, Rector of East Ilsley, and Edward Morland, of West Ilsley, near Abingdon, Berks. From my uncle's church, at East Ilsley, we could see the race-horses exercising at the top of the downs, near an ancient barrow, locally called Scutchimore Nob. My father used to take us to the top of this barrow, and give us a lecture upon the battles of the great King Alfred, which took place all along these Berkshire downs. It was inside Scutchimore Nob that an ancient British warrior was dug up. Inside the skeleton was a mass of seeds of wild raspberries, probably the remains of this gentleman's last repast. My father took some of these seeds to Dr. Daubeny, Professor of Botany at Oxford, who grew plants from some of them. The traveller, by a down train on the Great Western, can see a high mound just beyond Reading, called "King Alfred's standing." Tradition states that the king stood on the top of this hill and watched the Danes' retreat, after they had been well



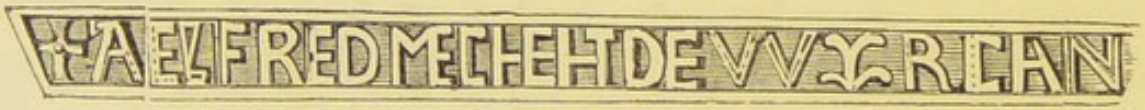
3



2



1



4

KING ALFRED'S JEWEL.

[*To face page* 373.

thrashed by his Saxon soldiers, fighting along the downs to the west of this point. Again, a little before the traveller arrives at Swindon, he can see, to the south of him, White Horse Hill, on the side of which is cut out in the turf a rude outline of a white horse; the white chalk shows up from the lines where the turf has been pared away.

The great King Alfred first saw the light in this part of England; he was born at Wantage, in Berkshire, A.D. 849. In October, 1849, the 1000th anniversary of his birthday was celebrated at Wantage. In the museum at Oxford, is a most interesting and valuable relic* of King Alfred the Great, of which I now give an illustration.†

The jewel is made of gold, elaborately wrought in a peculiar kind of filagree, mixed with chased and engraved work. The legend around the edge of the jewel (No. 4), "Aelfred Mec Heht Dewercan" (Alfred ordered me to be wrought), is cut in bold characters, the intervening spaces being pierced, so that the crystal within is seen (No 2). The face is formed of a piece of rock crystal four-tenths of an inch in thickness, under which is placed the singular enamelled subject No. 3. It has been supposed to be a representation of the Saviour, St. Neot, St. Cuthbert, or of King Alfred himself. The workmanship on the other side (No. 1), is very curious; the design was first traced out in filagree attached to the face of the plate of gold; the intervening spaces were then filled up with vitreous

* This relic was formerly in the Ashmolean Museum.

† This illustration is copied from the Proceedings of the Archæological Society, and was used by the late Mrs. Quekett, when writing in "Land and Water," upon Ancient Jewels.

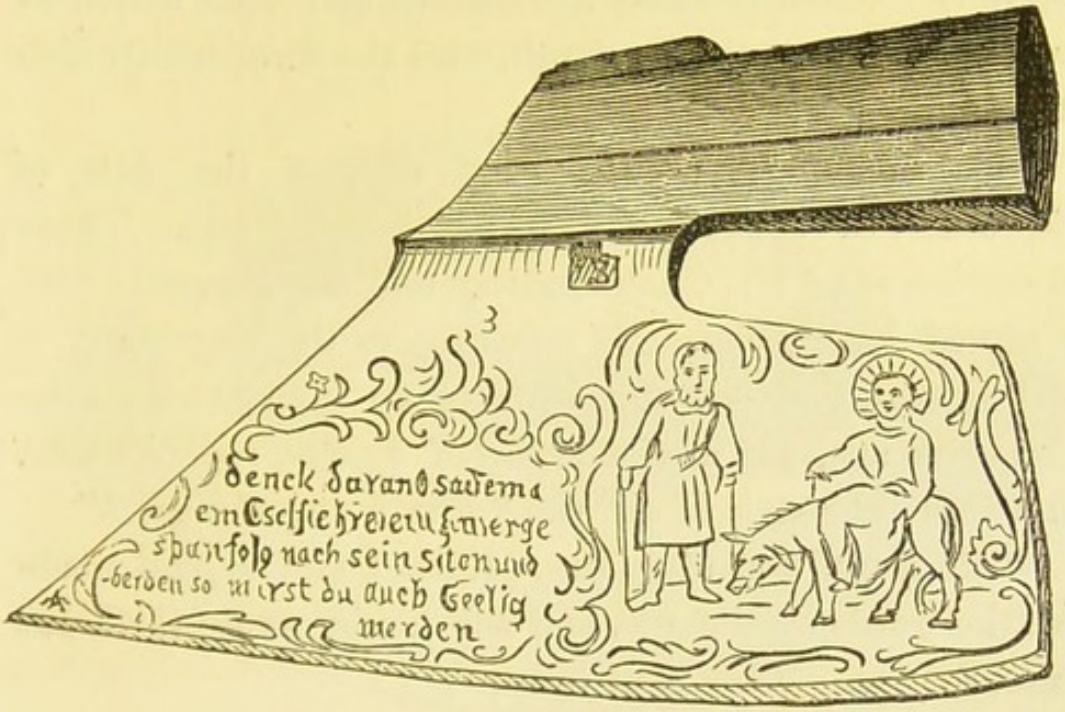
pastes of different colours, so that at first sight the work appears to resemble a mosaic. The colours were probably fixed upon the plate by fusion. This relic was found, 1693, at Newton Park, in Somersetshire, not far from Athelbury, the ancient Æthburgay, where the great Saxon king took refuge with a few followers, and fortified himself successfully against his Danish foes, A.D. 878.

Execution Axe.

In Nov., 1874, when on duty, officially inspecting the Cound Brook, a tributary of the Severn, near Shrewsbury, my friend, Mr. Cholmondeley, of Condover Hall, kindly invited me to dine and stay a few hours at his mansion. Condover Hall is a very old place, and contains a collection of very valuable pictures.

The house is built in the form of two letters E placed back to back. This building of a house in the shape of a monogram is supposed to be a compliment to Elizabeth, who was Queen when the house was built. The hall at Condover contains a beautiful collection of ancient armour and weapons of all kinds, all of great antiquity and value. My host kindly explained the various objects in his collection; and, as we remained in the armoury till far into the small hours, the silence and the darkness of the ancient hall, where suits of armour, &c., stand, perpetual sentries, gave additional interest to the various venerable and historical arms he kindly took down from the walls to show me. Two objects in the armoury, above all others, took my fancy, viz., an Execution Axe and a Slave's Collar. By the kindness of Mr. Cholmondeley,

I am able now to give drawings of both. Here is the Execution Axe.



EXECUTION AXE.

I took a rubbing of it in pencil, and Mr. Cholmondeley's carpenter made me a model in wood.

It measures along the curve twelve-and-a-half inches. One side of it is sloped off in a very peculiar manner, evidently the result of experience on the part of executioners. The edge is sharp, but not so sharp as one would have anticipated.

On placing the edge on a table, and rolling the axe gently forwards and backwards, I find that there is always a point where it bites. It is a most scientifically constructed instrument. Into the socket was fixed a handle, of wood, probably. Mr. Cholmondeley tells me that it is recorded that the handles of some execution

axes were hollow, and that a cavity at the lower end contained quicksilver; when the blow was given the quicksilver ran instantly down the handle, and thus added its weight to that of the axe itself, plus the force with which it was wielded.

This is a German execution axe, of the date of Edward VI., about three hundred years ago. These execution axes, Mr. Cholmondeley told me, generally bore a sacred inscription. By referring to the engraving, it will be seen that not only is there an inscription on the Condover axe, but also a group of figures, representing, in a very rude style of art, the "Flight out of Egypt."

With great difficulty, Mrs. Midford and myself made out the words on the axe, and she kindly wrote them out exact for me. They read thus:—

"Denck daran O Sunderman
Ein Eselfiehrer den Herren gespan
Folg nach sein siten und geberden
So wirst du auch Seelig werden."

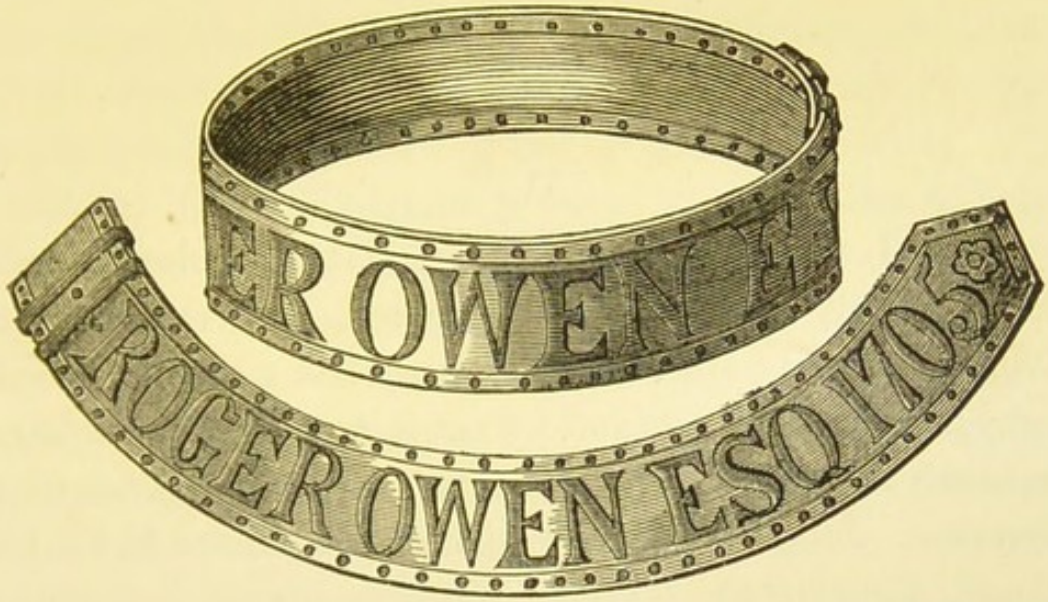
These verses may be thus translated:—

"Think of this, O sinful man;
A donkey driver and the Lord mounted,
Follow after his precepts and example,
And thus shalt thou be blessed."

Nothing more than I have written above is known of the history of this axe. Mr. Cholmondeley tells me it is a very precious relic. Would that the axe could only tell us its story

Collar of Black Page.

This collar is just about large enough to fit round the neck of a youth; it is $15\frac{1}{2}$ inches round, measured inside, and $1\frac{3}{8}$ inch wide. It was fastened on with a padlock.



SLAVE'S COLLAR.

Mr. Cholmondeley tells me that about one hundred years ago fashionable ladies thought it "the thing" to be attended by a Black Page, who wore ornamental collars on their necks. In Hogarth's picture, "Taste in High Life," 1742, a black Page is represented wearing a collar similar to that here shown. In the present instance the collar, though very like an ordinary dog's collar, is rather ornamental than otherwise. These Pages' collars are now exceedingly rare, as, when the slaves were liberated in England, the collars were used for dogs' necks. In fact, it may be that the pattern of the present dog collar was originally taken from the slave's collar.

Roger Owen, whose name is engraved on the collar as the owner of the slave, was an ancestor of Mr. Cholmondeley's.

JOHN HUNTER REVIVED.

JOHN HUNTER, the greatest anatomist, physiologist, and surgeon that England ever produced, died October 16, 1793, aged sixty-four. His memory has not yet passed away from amongst us, and I trust it never will pass away, so much does suffering humanity owe to his great discoveries. John Hunter had a country residence at Earl's Court, Kensington. The old parish church has lately been pulled down, and it has been proposed to place memorial windows, in memory of historical personages connected with Kensington parish, in the church lately built by Sir Gilbert Scott, R.A., which was consecrated in 1872. A list has been published of the illustrious individuals who lived at or near Kensington, and whose memory will be thus recorded for generations to come. Among these illustrious names I find Sir Isaac Newton, Charles James Fox, Lord Macaulay, Archbishop Whately, William Wilberforce, Sir David Wilkie, Sir Augustus Callcott, R.A., Dean Swift, William Penn, Robert Nelson ("Fasts and Festivals"), W. M. Thackeray, Dr. Crotch (Doctor of Music), and many others. The royal names of Queen Victoria (born in Kensington Palace), King William III., Queen Mary II., Queen Anne, George I.,

George II., the Duchess of Kent, and Queen Caroline, must also be be included, as they all lived in Kensington.

The Presidents of the Royal Society, the Royal College of Surgeons, the Royal Academy of Arts, the Royal Society of Literature, and the Society of Arts, have been asked to join the committee, with the view of seeing that the men, eminent in the respective subjects watched over by each society, are properly represented by the proposed memorials.

In the list of illustrious persons whose names will be thus handed down to posterity is that of John Hunter, who for many years lived at Earl's Court, Kensington. My friend John Merriman, whose family has been so long established at Kensington, has been kind enough to invite me to examine this house, and the grounds connected with it. In Foot's "Life of Hunter, 1794," we read: "To unbend the mind from the tedium which, during the summer months, comes over every man of care, stationary in this metropolis, to refresh the animal functions, half poisoned and debased by anatomical miasma, and to be as little as possible out of the way of the sudden calls of a surgeon, John Hunter chose a cottage at Earl's Court, about a mile, in the midst of fields, beyond Brompton. There he sometimes retreated for fresh air and took his hobby horse along with him. Nobody of common curiosity could have passed his original cottage* without being obliged to inquire to whom it belonged. By observing the back of the house a lawn was found stocked with fowls and animals of the strangest selection in nature, as if it had been another repository belonging to Brooks; and in the front there were to be seen four figures in lead or stone re-

* This is the very building now standing.

presenting lions, two in a form *passant*, placed upon the parapet, and on the ground two more *couchant*, guarding the double flight of steps leading to the vestibule. On the sides of the area were seen two pyramidal collections of shells, each of them seeming to conceal a subterranean entrance to a Golgotha. Over the front door was presented the mouth of a crocodile gaping tremendously wide. It was also at Earl's Court that he pastured those buffaloes which he, so lately as in 1792, put into harness and trotted through the streets of London. Savage beasts, said to have been snared on the lofty and barbarous mountains of Thibet, or on the dreary wilds of Boutan, and imported here for autumnal exhibition on carnival days at Smithfield, held in honour of St. Bartholomew, were sure to be first shown to John Hunter, by their keeper, thus enhancing the estimation of his rare Asiatic curiosities. We are also told that giants and dwarfs were certainly retained by him for dissection whenever the Fates should determine it—whenever the sisters' shears of destiny should cut the threads on which their lives suspended."

Mr. Merriman assured me that, according to all local tradition, the house and grounds are very little, if at all, altered since the days when John Hunter lived there. It was, therefore, a real treat to me to be allowed to go over them with Mr. Merriman and his partner, Mr. Arthur Roberts, and we owe many thanks to the present occupier of the house, Dr. Gardiner Hill, for his kindness in allowing us to go over the premises.

John Hunter built this house himself. It was originally a plain brick building, in the form of a square ; but, as his practice increased, he added to it on both sides. It is

just the sort of house the great anatomist would have built. There is not the slightest attempt at effect or useless ornamentation. His favourite room was evidently the large room on the ground floor, looking out on the park. In this room there was plenty of space for his papers, books, instruments, microscopes, and all the paraphernalia of a working physiologist. Mrs. Hunter's rooms were evidently up-stairs, and the panels of the doors are ornamented with drawings painted in water-colours. No doubt John Hunter had as great a horror of feminine interference in his studio as have most philosophers of the present day.

All round the house is a covered cloister dug about six feet into the earth. I expect John Hunter had two reasons for making this cloister, which is very like a prolongation of an area to a London house. Firstly, this cloister would keep the house dry, and secondly, it would form a grand place for keeping live stock. I have no doubt, therefore, that in this cloister he kept many of his smaller animals used for experiments, such as dormice, hedgehogs,* bats, vipers, snakes, and snails, for his researches

* John Hunter was very fond of experimenting with hedgehogs. He thus writes to Dr. Jenner :—"I received yours with the hedgehog, but I want more : I want you to get a hedgehog in the beginning of winter and weigh him ; put him into your garden, and let him have some leaves, hay, or straw to cover himself, which he will do ; then weigh him in the spring and see what he has lost. Secondly, I want you to kill one in the beginning of winter to see how fat he is, and another in the spring to see what he has lost of his fat." Again —"If you could send me a colony of hedgehogs, I shall be glad, as I have expended all I had but two ; one an eagle ate, and a ferret caught the other." Subsequently—"Can you send me more hedgehogs this spring? all those you sent me died, so that I am *hedgehogless*." Jenner was the great discoverer of vaccination, A.D. 1780.

on torpidity; and hutches full of rabbits, whose unfortunate fate would be to have their ears frozen, to prove points connected with blood circulation.

It would also be a good place to hang up skeletons, or dry preparations, or to macerate bones. Nobody knows better than myself the value of an area—I am sorry to say my own area in Albany Street is terribly small—to a London house, especially when one has a great many dissections on hand; and I have no hesitation in saying that John Hunter made a great many of his preparations, now in the Museum in the Royal College of Surgeons, in this cloister-like area.

The entrance into these cloisters leads through a subterranean passage, very dark, and like an enlarged fox's earth. This passage, again, I warrant, was one of Master John's contrivances, for into his burrow he could wheel a tidy-sized cart or truck, and drag into his den anything, from a giant's body up to a good-sized whale; and I have no doubt that the *Balænoptera Rostrata*, seventeen feet in length, described in his works on whales, was once carted down this passage into the area, to be cut up and figured and described. The entrance to where the stables originally stood was not far from this burrow, and John could have easily whipped anything into the stable-yard down his fox's earth, and into the area, without Mrs. Hunter knowing anything about it; and I'll be bound to say she used occasionally to "lead him a life," and kick up a row if any preparation with an extra effluvium about it was left on the dissecting-table, when the great surgeon was obliged to go out on his professional duties. This dissecting-table is now in the museum of St. George's

Hospital. We have also the skin of the cow from which Jenner first took vaccine lymph.

At one end of his burrow there is a mysterious-looking door, which leads into a small room, now used as a general receptacle for rubbish. Up in the corner were a lot of bones. I eagerly examined them, but they were only kitchen bones. In another corner of this room there is a largish-sized copper boiler standing out of the wall. Two doors fit on the top of this boiler and close it up quite tight. Ah! if this old boiler could only tell what it had boiled! *One* giant, we know, was boiled up in it; for in 1787 John Hunter wrote as follows to Sir Joseph Banks:—"I have lately got a *tall man*. I hope to be able to show him to you next summer." This tall man was no doubt O'Brien, the Irish giant, whose skeleton is now in the Hunterian Museum at the College of Surgeons, alongside the skeleton and coffin-plate of "Jonathan Wild," the great thieftaker of Jack Sheppard's time. O'Brien (or Byrne) was said to be over 8ft. high, In the *Annual Reporter Chronicle*, June 1783, we read:—"The giant expressed an earnest desire that his ponderous remains might be sunk out at sea; but, if such were his wish, it was never fulfilled, as Mr. Hunter obtained his body before interment of any kind had taken place." Elsewhere we read:—

"In the dead of night the body was removed in a hackney coach, and having been carried through several streets, was transferred to Hunter's own carriage, and conveyed immediately to Earl's Court. Fearing lest a discovery should take place, Hunter did not choose to risk the delay which the ordinary mode of preparing a

skeleton would require; accordingly the body was cut to pieces, and the flesh *separated by boiling;* hence has arisen the brown colour of the bones, which in all other respects form a magnificent skeleton."

John Hunter is said to have given £500 for the body of O'Brien. I doubt if he did anything of the kind, for I well recollect old Mr. Clift (who was John Hunter's assistant), telling me when a boy a very different story.* In Bristol Museum, if I recollect aright, there is, or was, a stocking of O'Brien hanging against the wall. As far as I remember the inscription says, "This is the stocking of O'Brien, the Irish giant, who *lies buried in the cathedral churchyard.*" At all events, there is but little doubt that O'Brien was wheeled down John Hunter's fox earth, cut up in the area, and boiled down in John's universal preparation maker. I looked, therefore, upon this boiler with a certain degree of awe and reverence, and as I got upon the stool to examine it, I repeated to Merriman a verse out of the old Winchester song of the workhouse boy:—

> At length the soup-copper repairs did need;
> The coppersmith came, and there he see'd
> A dollop of bones lay grizzling there
> In the leg of the breeches the poor boy used to wear.

I opened the cover of the boiler and anxiously felt about in the dark for anything I might find, as I thought it was just possible that some relics of the great John's culinary operations might still be left. I could not, however, discover anything except a very old rusty key covered up with dust at the bottom of the copper. Whether this

* See subsequent correspondence.

was O'Brien's key I don't know, at all events it is an interesting relic. John Hunter took care that neither Mrs. Hunter nor anybody else should go prying about this copper. The big doors are so arranged that no smell should escape except up the chimney, and that there should be more room than at first sight seems possible, for steaming as well as boiling.

My remarks about the giant led to a great deal of correspondence in *Land and Water*, which I now append for future reference :—

SKELETON OF O'BRIEN THE GIANT.—A correspondent to the *Bristol Daily Post* writes as follows :—

"Sir : Your correspondent, Mr. Allen, is in error in supposing that the skeleton of Patrick Cotter O'Brien, known as Larry O'Brien, the famous Irish giant, who died at the Clifton Hotwells, and was buried at the Roman Catholic church of St. Joseph, Trenchard Street, is in the museum of the Royal College of Surgeons, London. The skeleton to which he refers is that of Charles Byrne, who went by the name of O'Brien, in order to claim descent from some of the Kings of Ireland, and who died in 1783, at the early age of twenty-two years. Byrne was said to have measured in his life-time 8ft. 4in. in height ; but it is doubted by those who know the skeleton whether he quite reached that standard. Patrick Cotter O'Brien died in 1806, in his forty-sixth year. His stature exceeded 8ft. 3in., and he was proportionately large, as may be seen by his shoe and stocking, which are still preserved in the museum of our Philosophical Institution, and I believe also a cast of his hand. It is true, as stated, that he used to take the covers off the street lamps, which were then of oil, and not fixed so high as at present, for the purpose of lighting his pipe ; and I have heard my late father, who attended him medically, say that it was a habit with him, when in a room, to rest his arms on top of the door. At his burial, I was assured by my father, extraordinary pains were taken to prevent the possibility of his remains being disinterred. O'Brien, who was a man of exceedingly tender disposition, had an intense horror of the anatomists, and the priest who ministered to him in his last illness gave him a promise that his body should never be disturbed. His coffin was filled with quick-lime, and it was lowered to an enormous depth into the solid rock. A ponderous stone was then fastened over it by means of iron bars, and

the vault was then built up to the level of the ground. Besides all these precautions, many of his countrymen and friends for a long time kept watch; and I have heard my father express his assurance, in the strongest terms, that all that is mortal of the greatest man of his age, still lies beneath the earth in Trenchard Street."

"Sir: As Mr. F. Buckland is so anxious to make out the true history of O'Bryan, the Irish giant, whose skeleton is in the Museum of the Royal College of Surgeons, perhaps the following account of it in Drewry Ottley's admirable 'Life of John Hunter' will assist him:—Byrne, or O'Brien, the famous Irish giant, died in 1783. He had been in a declining state of health for some time previously, and Hunter, anxious to procure his skeleton, set his man, Howison, to keep watch on his movements, that he might be sure of securing his body at his death. Byrne learned this, and, as he had a horror of being dissected, determined to take such precautions as should ensure his not falling into the hands of the doctors. He accordingly left strict orders that his body should be watched day and night until a leaden coffin could be made, in which it was to be enclosed, and carried out to sea and sunk. Byrne died soon after, and in compliance with his directions the undertaker engaged some men to watch the body alternately. Howison soon learned this, found out the house where these men went to drink when off duty, and gave information to Hunter, who forthwith proceeded thither, with the view of bribing them to allow the body to be carried off. He had an interview with one of the party at the alehouse, and began by offering him fifty pounds if he would allow the body to be kidnapped. The man agreed, provided his companions would consent, and went out to consult them. He returned shortly, saying that they must have £100. Hunter consented to this, and thought the affair settled; but the men finding him so eager, soon came back with an increased demand, which was also agreed to; when further difficulties were found, and larger and larger demands made, until, it is said, they raised the price to £500! The money was borrowed from Pidcock to pay them. Now, I believe there were two 'giants in those days,' one who died in London, and is now in the College Museum, and another in Bristol; the real name of one of them being Patrick Cotter, who assumed one of the above names. I know there was a rumour of one being buried at (I think) St. Mary's, Redcliffe, Bristol: another statement was that the body was carried out to sea, and then 'committed to the deep.' Perhaps I have now put Mr. Buckland on the track he wants."

"Patrick Cotter O'Brien was a native of Kinsale, and born in 1761. His real name was 'Cotter,' and his parents were very poor people. His father let him out, if I may use the expression, when eighteen years

of age, to a showman for fifty pounds a year, but Cotter, on arriving at Bristol, refused to exhibit unless the man gave him some private remuneration besides food, clothes, and lodging. The showman put him in prison, and some kind man, finding that the contract was an illegal one, succeeded in liberating him from it. He then took the field on his own hook, with such success that he pocketed £30 in three days. He became ashamed of the plebeian name he bore, so tacked on O'Brien to it, and said that he was descended from the Irish king, the real 'Brien Boreau.' He realised a little fortune, and died at Clifton, when he was forty-seven years old. This information I got from an Irish gentleman who says he has often heard the account, and asserts that it is an authentic one ; but there was a well-known Irish giant named Charles Byrne, who died in Cockspur Street at the age of twenty-two, some time in the autumn of 1782. He requested that his body might, after his death, be thrown into the sea, and some people assert that his remains were really put on board a vessel and sunk in the Downs in twenty fathoms of water, but it was not so. William Hunter gave five hundred pounds for Byrne's body, and it was placed in the Museum of the College of Surgeons. Now which of these two men does your correpondent, Mr. Buckland, allude to ? Magrath is another big man of the period. His skeleton adorns Trinity College, Dublin, I believe. Did Mr. Buckland ever read of the giant and dwarf Congress at Vienna in the seventeenth century, when the dwarfs, like so many Pucks, tormented the giants nearly out of their senses, and sentinels were stationed to protect the big specimens of humanity from the little ones ? "—EVE.

"Sir : It appears that the giant who died in London was not the same individual who was buried at Bristol. It is thought they were identical, and that Hunter sent a party after the hearse, who overtook it on the way to Bristol, made the man drunk at a public, then substituted a weighted coffin, and slipped back to London with the giant's remains. As these 'great men,' living and dying about the same time, assumed names without the king's sign-manual, it is very likely that the confusion it has caused may have led to the skeleton at the Museum of the Royal College of Surgeons being incorrectly labelled."—F. H. SALVIN.

As I searched about in the copper I fancied the great John behind me, with his high cheek-bones, bright intelligent eyes, expressive eyebrows, and white hair curled behind, and his hands in his pockets, smiling his satirical smile at me and saying, " So, Master Frank, there you are

again ; you found my body in the vaults of St. Martin's-in-the-Fields and got me buried in Westminster Abbey twelve years ago ; and now I find you actually in my house investigating my private skeleton-making copper. Never mind, my son, keep up my memory, and perhaps I will give you a wrinkle about Salmon from my notes that may be of use to you, *a cartload* of which (as Sir William Fergusson rightly said in his last oration in my honour at the college) Sir Everard Home burnt, and which are now lost to your generation."

The great John thus wrote to Dr. Jenner :—"I received your salmon, and just examined enough to want another." "If you can get me some salmon spawn, I should like to have it, and out of different places, as it will be of different ages." "I want to examine the spawn of fish in the progress of the formation of the young one." How I should like to show the great physiologist over my Museum of Economic Fish Culture at South Kensington ! How pleased he would be with my hatching-troughs, my yearling salmon, and my four-year-old lake trout ; also, I trust, with my "pyloric appendage" theory, and my casts of dissections in plaster-of-paris, especially when painted by my good friend Rolfe—the dear John was not well up in casting. In my humble way I mean to follow the steps of my great Master, and am trying to make such a Bucklandian fish museum as will be appreciated some of these days. My Father left his museum of Geology to the University of Oxford. It is called the "Bucklandian Museum."

Close to the boiler are the old (now tumble-down) pig-styes, and it was doubtless in these very pig-styes that

John Hunter kept the little pigs which he fed with madder, so as to cause their bones to become red. (See preparations in the College of Surgeons.) This was doubtless also the place referred to when he wrote :—" I gave pigs a preference over any other animal, as being easily



COCK'S SPUR TRANSPLANTED TO HIS COMB.

managed, and breeding perfectly well under the confinement necessary for experiments. I selected a sow and cut a slit in her ear to distinguish her from the others." From observations made here, doubtless, came Hunter's valuable paper on the functions of the ovaria.

In the farmyard, by the pig-stye, no doubt were kept

the cocks and hens whose spurs John Hunter cut off and planted into their combs. In his Hunterian Oration for 1871, Sir William Fergusson, F.R.S., President of the College of Surgeons, writes:—"Dr. Hamel and John Hunter were the great animal transplanters, if I may so call them, of their day." Here are the celebrated pre-



COCK WITH SPURS GROWING IN HIS COMB.

parations, from Hunter's own hands, of cocks' spurs taken from their natural locality, growing in their own combs.

By the kindness of Sir William Fergusson and Messrs. Churchill, of New Burlington Street, I have been allowed the loan—which I most gratefully acknowledge—of the blocks used in Sir William's Hunterian Address for 1871.

Mr. Bartlett, of the Zoological Gardens, tells me that

the Prince of Wales received, as a present, one of these "Hunterian Fowls," the true nature of which Mr. Bartlett explained to His Royal Highness.

Mr. Ward, naturalist, of 27, Harley Street, in June, 1871, was good enough to submit to me a cock with a transplanted spur growing in his comb. Mr. Ward, at the same time, furnished me with its history. The owner writes:—

"The bird was brought into Zanzibar from the interior of Africa, and was purchased by the ex-King of Oude for fifty guineas, from whom I got him, owing to his crowing all night, which, among Asiatics, is a sign of death. I have endeavoured to find out if any bird of the kind has ever been heard of, but have always been replied to in the negative. I should feel exceedingly obliged by your giving me any information you can regarding him. Fortunately, I have nine of his breed just hatched, and I hope they may prove to be the same as regards the peculiarity of the horn.

"George Bishop.

"Hedenham Lodge, April 30."

The moment I saw the bird, I recognised it as a good example of the famous experiment of the great John Hunter. I cannot, of course, deny the foreign origin of the cock, but I can easily account for the horn in his comb. One of his own spurs, or even the spur of another cock, has been cut off and transferred to the comb, in the substance of which it has taken root and grown. This experiment is so interesting that I shall quote John Hunter's own observations from his well-known work on the blood.

"*Union of different parts of the same or different bodies—Transplanting or grafting of parts.*

"I have hitherto explained union as taking place only in the division of corresponding parts of the same living body; but it is equally possible to unite different parts of the same or of different bodies by bringing them into contact under certain circumstances. There is seldom occasion for such practice; but accident, or rather want of attention, has in some cases been the cause of union taking place between different parts of the body. The chin has been united to the breast, the tongue to the lips or cheek, etc., and when this happens it has commonly been through the medium of granulation. The attempt to unite parts of two different bodies has only been recommended by Taliacotius. The most extraordinary of all the circumstances respecting union is by removing a part of one body and afterwards uniting it to some part of another, where on one side there can be no assistance given to the union, as the divided or separated part is hardly able to do more than to preserve its own living principle and accept of the union.

"The possibility of this species of union shows how strong the uniting power must be. By it, the spurs of the young cock can be made to grow on his comb, or on that of another cock. Teeth, after having been drawn and inserted into the sockets of another person, unite to the new socket, which is called transplanting.

"Ingrafting and the inoculating of trees succeed upon the same principle.

"I took a sound tooth from a person's head; then made a pretty deep wound with a lancet into the thick part of a cock's comb, and pressed the fang of the tooth into this wound, and fastened it with threads passed through other parts of the comb. The cock was killed some months after, and I injected the head with a very minute injection. The comb was then taken off and put into a weak acid, and the tooth being softened by this means, I slit the comb and tooth into two halves in the long direction of the tooth. I found the vessels of the tooth well injected, and also observed that the external surface of the tooth adhered everywhere to the comb by vessels, similar to the union of a tooth with the gum and sockets."

There are several of Hunter's preparations now in the College of Surgeons to show the experiments he carried out in order to prove his statements as above, thus:—

47. A section of the head of a cock and a human tooth, which was

transplanted, immediately after extraction, into a wound in the cock's comb. The surface of the fang is intimately united to the surrounding substance of the comb, and, by the injection of the blood-vessels of the head, vessels are demonstrated passing from those of the comb into the pulp of the tooth.

48. The other section of the same head and tooth.

49. A section of the comb of a cock into which a human tooth was similarly transplanted. The surface of the fang of the tooth is in contact, but not evidently united with the comb. A pale fleshy growth extends from the comb into the pulp-cavity; but it has not, as in the last preparation, the appearance of a tooth pulp, neither is its vascularity evident.

50. The other section of the same tooth and comb. There is here a narrow empty space between the surface of the tooth and the adjacent substance of the comb.

In the farmyard at Earl's Court, besides the cocks with their spurs in their combs, John Hunter kept likewise the ducks used for the table, and also for experiment; for he writes:—"I took two ducks, and fed one with barley, the other with sprats, for about a month, and killed both at the same time. When they were dressed, the one fed wholly with sprats was hardly eatable, it tasted so strongly of fish."

Above the stable was the pigeon-house, in which lived the pigeons, from the observation of which he was enabled to write as follows:—"During incubation, the coats of the crop in the pigeon are gradually enlarged and thickened, like what happens to the udders of females in mammalia in the time of uterine gestation. If we allow either of the parents to feed the brood, the crop of the young pigeons, when examined, will be discovered to contain the same kind of curdled substance as that of the old ones, which passes from thence into the stomach, where it is to be digested."

This, then, is the philosophical explanation of the vulgar story of "pigeon's milk." The poor cocks and hens, the turkey cocks and the geese in the farmyard, the eagles, owls, and hawks in the hayloft, and the ostrich in the cow-house, were all likewise subjected to experiment to prove that the air-cells in birds' bones and feathers communicated with the lungs, for he writes :—"I next cut the wing through the *os humeri* in another fowl, and, tying up the *trachæa*, as in the cock, found that the air passed to and from the lungs by the canals in this bone. Hence the story that John Hunter "made a cock breathe through his wing bones." The same experiment was made with the *os femoris* of a young hawk, and was attended with a similar result. In the stable-yard were chained up wolves, jackals, and dogs, whence he obtained those curious hybrids, "one of which, being three-parts dog, I gave to my friend Mr. Jenner, of Berkeley." John Hunter accidentally broke his *tendo Achillis*, so he set to work experimenting with dogs; he divided the *tendo Achillis* in several dogs by subcutaneous incision, and killed the dogs at different periods to see the progress of the union. There were boxes for the accommodation of opossums, "which I have often endeavoured to breed in England. I have brought a great many, and my friends have assisted me by bringing them or sending them alive, but I could never get them to breed, so that I am left to conjecture as to many parts of their economy." Here also was, in his kennel, the dingo, of which John says, "he is capable of barking, although not so readily as a European dog; he is very ill-natured and vicious, and snarls, howls, and moans like dogs in common." In

the stables he doubtless kept the donkeys, and the mules, and the celebrated free marten, "which I had from Benjamin May, Esq., of Denham, near Uxbridge, who knew my anxiety to ascertain this point."

After Merriman and myself had examined the house, we went into the field in front of John Hunter's sitting-room. In the middle of the field there is a hollow. This was formerly a pond, in which John Hunter tried experiments to force Scotch river mussels to form pearls after the manner of the Chinese experiment. In 1787 he writes as follows to Sir Joseph Banks:—

"Dear Sir Joseph,—I have these two days been draining the pond, or rather fishing for pearls, the success of which you will see by the specimens. Those I had made the experiments on were dead, but there is one recent. I have a few alive that I mean to put under experiment; but I shall open the shell and put in the extraneous body. If any other method suggests itself to you, be so good as to inform me. I would not have you make Lady Banks a present of them; I hope to get better, at least as large as my thumb."

Here, too, he kept his fish, frogs, leeches, and eels for experimental purposes. These fish contributed much to his paper on "Animals Producing Heat." Thus we read:—

"I froze the tail of a tench, which became as hard as a board. When thawed, that part was whiter than common, and when it moved the whole tail moved as one piece, and the termination of the frozen part appeared like the joint on which it moved. On the same day I froze the tails of two gold-fishes till they became as solid as a piece of

wood. They were put into cold water to thaw, and appeared for some days to be very well; but that part of the tails which had been frozen had not the natural colour, and the fins of the tails became ragged."

John Hunter writes the following Irishism:—"Frogs live an amazing while after they are dead." As regards eels, he says:—"I received yours with the eel. I shall send you back the eel again with the liver, stomach, and gut removed, and nothing left but a fringe, which passes down the sides of the backbone, which I took, and still take, to be the spawn. But I never saw any difference in it at any time of the year; and this one you have sent is similar to all I have yet seen. I think your stopping the eels a good plan, but I should suspect they would be more slippery than hedgehogs." Again—"Have you begun the eels? No porpoises—no salmon spawn; you see I am very greedy. What the devil becomes of your eels in the winter."

In the pathway near the house I observed a tree bearing very peculiar incision marks upon the bark. I think these markings upon the tree were also some of John Hunter's handiwork, inflicted on it when he was carrying out experiments on vegetable life apropos to the heat of vegetables, or more likely as to the relative powers of union in the bark of a tree as compared with that of the human skin. The markings were mostly above my head, but this might be accounted for by the fact that when John Hunter cut the poor tree about, the markings would be about the level of his head; but the growth of the tree since then would of course carry the markings up many feet higher. This, again, might have been the very tree

whose temperature was taken. "I put my long thermometer into the feather of a peacock's tail and introduced it into a hole in the tree. I began my experiments at six in the morning. The atmosphere was $57\frac{1}{2}^{\circ}$, the thermometer in the tree 55°." In one portion of the ground is a very old mulberry-tree. John Hunter says: "I made experiments on several trees of different kinds, as pines, yews, poplars, walnuts." He does not, however, mention this old mulberry-tree; but I'll be bound the poor old tree did not escape having holes bored into him by gimlets, to take his temperature, or freeze his sap in the spring months. Oh! that the mulberry-tree could tell us of the suffering of his fellow trees in the grounds, years ago, at the hands of John Hunter! The trees he experimented on were then little saplings, now they are great big full-grown trees. I should like to examine them all closely when they are cut down.

Close to the mulberry-tree at one corner of the field is an artificial mound of earth very much the shape of an ancient burial tumulus such as we see on the Downs. The west side of this mound has a passage in it leading to three cellar-like vaults. This is even now called the "Lion's Den," and there can be no doubt that John Hunter used to keep his lions and leopards in this place.

His sitting-room windows face this den, so that he could readily watch the animals from his easy-chair. This is doubtless the den from which his leopards escaped, the incident of which is thus recorded:—Two leopards broke from their confinement, and got into the yard with the dogs; a fierce encounter immediately commenced, the noise of which alarmed the neighbourhood, and quickly

brought out Hunter to inquire into its cause. He found one of the leopards engaged with the dogs, whilst the other was making his escape over the wall; and instantly, though quite unarmed, he ran up and laid hold of both the animals, which fortunately submitted to be led back to their den and secured. When the danger was over, however, he became so agitated at the recollection of it, that he fainted.

I closely examined these dens, but could find nothing but a very decrepit old wheel-barrow, which might have been John Hunter's, from the look of it. In the largest den, however, I found a post and iron chain, such as is used for tying up cattle. The block of wood at the end of this chain is very old and worm-eaten, the chain also is very much worn. I think there can hardly be a doubt that this was the post to which John Hunter used to tie up the little bull which the Queen gave him, and which little bull nearly killed the great John; for the story goes that one day when wrestling with the bull the beast knocked him down, and would have gored him severely had not one of the servants driven the animal off with a stick.

On the top of the "Lion's den" there is a little rampart made of bricks and tiles, after the fashion of the top of a castellated tower—a sort of private fortress, in fact. The legend is that John Hunter kept a gun here, which he used to fire off occasionally; gun or no gun, there is an excellent look-out from the top of the "Lion's den." In John Hunter's time, Earl's Court was quite in the country, and from the "Lion's den" he would have had a good view of Westminster Abbey, little thinking he

would ever be buried there. Near this place is a gateway, but neither Merriman nor I could make out whether this was a "dummy" gateway or intended for use; but depend upon it, John Hunter put it there for some purpose. His town house was situated about the middle of the eastern side of Leicester Square, and extended through into Castle Street; and here he established his museum. The great John Hunter's bust is at the north-east corner of the Square. Reader, go and take your hat off to a wonderful likeness of this great man.

John Hunter used to drive a pair of bay stone-horses to and fro from Leicester Square to Earl's Court. Foot writes:—"On being told of his death at St. George's Hospital, on the 16th of October, 1793, on the same day I recollect having seen his bay stone-horses returning through Piccadilly home without their master; and this circumstance introduced to my reflection the sympathy which Virgil has attributed to the war-horse of young Pallas in his funeral procession:—

> "Post Bellator Equus positis insignibus Æthon
> It lachrymans."

As I stood on Hunter's "Lion's den," I imagined this same carriage, with the high-stepping bay stallions, their coachman in tears, turning in for the last time to this very gateway, after Mr. Foot had seen them in Piccadilly on the 16th October, 82 years ago, and I pictured to myself the consternation and grief, which spread like wildfire through the establishment, on the sad news of "the Master's" sudden death. From that day the glories of Earl's Court set. There can never be another John Hunter.

I have thus endeavoured to describe Earl's Court, the

residence of the great and illustrious founder of the Royal College of Surgeons, and, to myself, a Demigod. During my visit to his former residence I almost imagined that I was in the presence of the great man himself, so little is the place changed. Mr. Merriman has kindly informed me that he will send to anybody who asks for it a picture of John Hunter's house and the "Lion's den" as they now stand, from drawings made by Mr. Arthur Roberts.

The memory of John Hunter will always be kept up by his immortal discoveries in Surgery and Physiology, by his Museum at the Royal College of Surgeons, and by the window in the new church at Kensington.

I conclude this slight sketch of our great John Hunter by quoting the words of Sirach as recorded in the Book of Ecclesiasticus:—

"Let us now praise famous men and our Fathers that begat us."

"Leaders of the people by their counsels, and by their knowledge of learning, meet for the people, wise and eloquent in their instructions."

"All these were honoured in their generations, and were the glory of their times."

"Their bodies are buried in peace; but their name liveth for evermore."

"The people will tell of their wisdom, and the congregation will shew forth their praise."

INDEX.

Accident to the rhinoceros, 39.
Adhesion of oysters, 126.
Affection in monkeys, 325, 336.
Alaska, seal-hunting in, 319.
Alfred's (King) jewel, 372.
American game, 123.
——————— close time for, 128.
——————— Buffalo, 127.
——————— Indians, fishing instrument of, 368.
Andaman monkey, a, 341.
Antiquities, 372.
Aquarium at Brighton, 193.
——————— Southport, 217.
Arctic regions, life in, 290, 292, 296, 306.
——————— water in, colour of, 300.
——— wolf, foot of, 33.
Armour, collection of, 374.
Artists' devices, 9, 13.
Axe, execution, 374.
Axminster, tidal wave at, 357.

Balancing statues, 54.
Barnacles, 201.
——————— from whales, 302.
Bear, Polar, foot of, 75.
——————— footsteps of, 34.
Beard, of monkey, 325, 337.
——— hair of, 74.
Beaver, footsteps of, 32.
——— tail of, 33.
Bezoar stone, the, 221.
Birds, power of flight in, 394.
Bittern, the, 148.
Black page, collar for, 377.
Bladder-nosed seal, 308, 315.
Bleeding, cure for, 166.
Blenheim Palace grounds, 47.
Blind man and dog, 110.
Blubber of seal, 313.
Boats taking the Bore, 348.
Bones of eagle, 265.
——— birds, structure of, 394.
Books, dummy, titles of, 369.
Booming of the bittern, 150.
Bore, on the Severn, the, 346.
——————— Humber, 357.
——————— Witham, 360.
——— origin of the word, 360.
Bos Scotticus, 256.
Brain of red-deer, 220.
——— eagle, 263.
Bream, large, 153, 158.
Brighton aquarium, the, 193.
Buffalo, American, 127.
Bull, John Hunter's, 398.
Burr, mouse, 42.
Bustard, gular pouch of the, 118.
Byrne, the giant, 383.

Caffres, and their performances, 18, 20.
Camel, foot of, 33.
Canvas-back duck, 130.
Cap for deer-stalkers, 236.
Carp, in the Serpentine, size of, 157.
Carrots floating in water, 10.
Cat Show at Crystal Palace, 252.
——— flesh of, as food, 255.
Cats, wild, 243.
——————— tail of, 244.
——————— voice of, 245.
——————— defeating an army, 246.

Cats, wild, intestines of, 247.
——— in France and Spain, 255.
——— capture of, 250.
Cattle, malformed, hoofs of, 231.
——— wild, white, 255.
——— at Tankerville, 258.
Chattering of walrus, 284.
Cheirotherium, the, 38.
Chicken and monkey, 342.
Child with two heads, 180.
——- carried off by eagles, 268.
Church roof of oak from Spanish Armada, 183.
Cinereous eagle, 267.
Claws of eagle, 266.
Cloisters at Earl's Court, 382.
Close time for sea fish, 83, 92, 94.
——— seals, 311, 314.
Club for killing seals, 296.
Cock's spur growing in its comb, 389.
——— comb, with human tooth grafted in it, 392.
Cod, 90, 194, 195.
—— spawn, destruction of, 92.
—— alive in boxes, 90.
Collar for black page, 377.
Comb of cock with spur growing in it, 389.
——— with human tooth grafted, 392.
Condover Hall, 374.
Copper for making skeletons, 384.
Cormorant, foot of, 37.
Country customs, 181.
Cow and red deer, hybrid between, 236.
Crab, the, 203.
——- as food for fish, 202.
——- food of, 204.
Cricket, singing of, 172.
Crommy heads of Jura, 226.
Cromwell, Oliver, at Harting, 183.
Cuttle-fish, 65, 203, 205.
——— eggs of, 66.
——— gigantic, 207, 211.
——— at Brighton aquarium, 203, 205.

Dangers of sea fishermen, 80, 84.
Daniel in the lions' den, 1.
Darwin and Development, 337.
Deer, red, 9, 219.
——— salt for, 223.
Deer, red, and railways, 240.
——— fighting, 232.
——— brain of, 220.
——— eating each other's horns, 222.
——— and cow, hybrid between, 236.
——— curious pouches of, 221.
——— fossil horns of, 224.
——— deformed horns of, 225.
——— hoofs of, 230.
Deer stalkers' cap, 236.
Deformities of deer horns, 225.
Dissecting house, John Hunter's, 382.
Diver, experiences of a, 132.
Dog-fish, 203.
—— of blind man, 110.
Dollars found at bottom of the sea, 133.
Double-headed snake, 178.
——— salmon, 178.
——— child, 180.
Dragon, the, anatomy of, 2.
Dresses for monkeys, 326.
Dried head of Indian, 57.
Duck, wild, foot of, 36.
——- canvas-back, 130.
Dummy books, titles of, 369.

Eagle, golden, 261.
——— carrying off a child, 268.
——— brain of, 263.
——— flight of, 264.
——— wing of, 263.
——— eye of, 263.
——— food of, 267.
——— structure of, 264.
——— protection of, 267.
——— claws of, 266.
——— cinereous, 267.
Eagre, or eygre, the, 360.
Earl's Court, John Hunter's house at, 379.
Earthquakes and sea waves, 358.
"Eclipse" whaling-ship, 295.
Eggs of snakes, 174, 175.
—— of cuttle-fish, 66.
Elephant's tusk, fossil, 137.
——— humerus, fossil, 185.
Elk, the, 128.
Emu, the, 48.

Emu, foot of, 35.
——— food of, 49.
Emus at Blenheim Palace, 48.
——— chased by harriers, 52.
Estuary of the Severn, the, 364.
Execution axe, 374.
Eye of eagle, 263.
——— walrus, 281.

Fat women, 26.
Fire-eaters, 20.
Fish, musical, 23, 310, 316.
——— birds eating, 37.
——— caught by trawlers, 82.
——— in the Serpentine, 151.
——— -ponds, cleaning of, 159.
Fishing scenes, 5, 8.
——— instruments of American Indians, 368.
——— in the North Sea, 79.
——— boats leaving port, 94.
Flesh of cat as food, 255.
Floe seal, 308.
Food of emu, 49.
——— sawfish, 278.
——— walrus, 285, 287.
——— whale, 300.
——— monkeys, 328.
——— suricate, 97, 99.
——— eagle, 267.
——— crabs, 204.
——— wild cats, 248.
Foot, muscles of the, 22, 338.
——— of bear, 75.
——— Napoleon's charger, 76.
——— camel, 33.
——— emu, 35.
——— woodpecker, 145.
——— bittern, 148.
——— monkey, 338.
Footsteps of beaver, 32.
——— cormorant, 37.
——— camel, 33.
——— Canada geese, 34.
——— ducks, wild, 36.
——— emu, 35.
——— kangaroo, 38.
——— llama, 35.
——— peccary, 37.
——— Polar bear, 34.
——— seal, 35.
——— swan, wild, 36.
——— wolf, 33.
Forest, origin of word, 242.
Fossil human skeleton, 19.
——— humerus of elephant, 185.
——— elephants' tusk, 137.
——— deer-horns, from Tay and Thames, 224.
Foxes in Iceland, 87.
Free martens, 238.
Frost, effect of on fish, 395.
Fur seal, the, 297, 316, 318.
Furs, collection of, 323.

Game, American, 123.
Geese, Canada, footsteps of, 34.
Giant O'Brien, the, 383.
——— skeleton of, 383.
Gigantic cuttle-fish, 207, 211.
Goats, wild, 271.
Golden eagle, 261.
Grafting of parts of bodies, 392.
Grasshopper, singing of, 172.
Great Grimsby docks, 89.
Greenland seal fisheries, 306.
Grouse disease, the, and eagles, 267.
Guide money for blind men, 116.
Gurnard, sapphirine, colours of, 196.

Hair of South American Indian, 57.
——— seal, 316.
Halibut, live, 90.
Hamilton wild cattle, 255.
Hand, muscles of the, 22, 338.
Harp seal, 307.
Harpoon for whales, 298.
Harting Benefit Society, 181.
——— church, 183.
Head of Indian, dried, 57.
Heat of animals and plants, 395.
Hedgehogs, experiments with, by John Hunter, 381.
Henry VIII., portrait of, 4.
Hercules and the hydra, 210.
Herrings, migration of, 194.
Hippocampi, or sea-horses, 202.
Hooded seal, 308, 315.
Hoof of Marengo, Napoleon's charger, 76.
——— malformed, of deer, 230.
——— cattle, 231.
——— sheep, 231.
Horns of deer, 222.

Horns of deer, size of, 224.
——————— curious, 226.
——————— deer eating, 222.
——————— fossil, 224.
——— wild cattle, 255.
Horse, curious muscles of, 3.
——— hoofs, of, malformed, 230.
——— flesh as food, 72.
——— introduction of, into South America, 46.
——— and deer, hybrid between, 239.
Horsehair cloth, manufacture of, 44.
Horse's tail, long, 46.
Humber, bore on the, 357.
Hunter, John, and the whale, 305.
——————— his house at Earl's Court, 371.
——— ——— researches of, 378.
——————— nearly killed by a bull, 398.
——— ——— death of, 399.
Hunting scenes, 3, 4, 11.
——— seals, 309.
——— in Alaska, 319.
Hybrid between cows and deer, 236.
——————— horse and deer, 239.
Hydra, the, and Hercules, 210.
——— is it the octopus? 210.

Ice, ships breaking through the, 290, 292.
—— seals on the, 309.
Icebergs, 87.
Iceland, 86.
Ichnology, 32, 38.
Indian, dried head of, 57.
Indians, North American, 7.
Intelligence of walrus, 292.
——————— monkey, 345.
Intestines of wild cat, 247.
Ironclads, 67.
Ivory from walrus, 286.

Jacob's flocks, colour of, 239.
Jewel of King Alfred, 372.
Jews' holidays, 154.
Jura, deer in, 226.

Kangaroos, track of, 38.
Kangaroos, tail of, 52.
——— ——— at Blenheim Palace, 52.
——————— chased by hounds, 54.
——————— cultivation of, 55.
——— ——— origin of name, 55.
Kensington, notabilities of, 378.

Laban's flocks, colour of, 239.
Labrador seal fishery, 311.
Lamb, Tartarian, 163.
Landseer's (Sir E.), lions, 9.
——— ——————— pictures, and the "red spot," 9, 13.
Leopards, John Hunter's, 397.
Lions, value of, 2.
——- Sir Edwin Landseer's, 9.
——- den, at Earl's Court, 398.
——————- Daniel in the, 1.
Lizards, 173.
Llama, foot of, 35.
Lobsters, colour of, 9.
Locomotion discovered by a monkey, 340.

Mackerel, 195.
Malformed hoofs of cattle and deer, 230.
——————— horns of deer, 225.
Marengo, Napoleon's charger, 76.
Mermaid, a, 27.
Mice and rats sinking a ship, 109.
-—— singing, 99, 103.
—— parasite in liver of, 42.
Migrations of fish, 194.
Milk of seal, 319.
Moles, uses of, 188.
Monkey, the, 124.
——————— dresses for, 326.
——————— and the parrots, 332.
——————— thieving propensities of, 330.
——————— and Darwin, 336.
——————— Andaman, the, 341.
——————— and chicken, 342.
——————— and parrot, 332.
——————— smoking, 343.
——————— intelligence of, 345.
——————— affection in, 325, 336.
——————— beard of, 325, 337.
——————— food of, 328.
——————— foot of, 338.

Monkey, pouch of, 331, 337.
Mother-Marking, 238, 240.
Mouse burrs, 42.
——— caught by oyster, 102.
——— and scorpion, fight between, 139.
Muscles of the foot and hand, 22, 338.
———— the kangaroo's legs, 53.
———— monkey's feet, 338.
———— under horse's skin, 33.
Museum at Peterhead, 295.
Mussels, pearls from, 273, 395.

Names of fishing smacks, 95.
Napoleon's charger, 76.
Nets destroyed by wrecks, 81.
Nicobar Islands, monkeys in, 344.
North Sea, fishing in the, 79.
Nostrils of walrus, 288.
———— bladder-nosed seal, 315.

Oak kettles, 87.
O'Brien, the giant, skeleton of, 383.
Ocean, beauties of the, 216.
Octopus, the, 65, 203, 205.
———— enormous, 207, 211.
Oil from seals, 297, 313.
———— walrus, 286.
Old woman, a very, 184.
One-legged girl, 21.
Organs of prehension in various animals, 205.
Origin of word kangaroo, 55.
———— forest, 242.
Otters and wild cats, 248.
Oxtail-soup, origin of, 53.
Oyster killing a mouse, 102.
——— attached to terrapin, 125.
Oysters, American, 123.
——— power of adhesion of, 126.

Painting, effects of, 8, 12.
Parasite in stomach of walrus, 291.
———— liver of mouse, 42.
———— on whale, 302.
Parchment from cat-skins, 255.
Parrot, skeleton of, a curious, 29.
——— and suricate, 99.
———— monkeys, 332.
Pearls in Scotch rivers, 272.
Pearls in Scotch regalia, 273.
——— from mussels—experiments by J. Hunter, 395.
Peccary, foot of, 37.
Penguin, wing of, 33, 97.
Penny shows, 17.
Perseus and Andromeda, 2, 11.
Peterhead Museum, 295.
"Pigeon's milk," 393.
Pigeon, pouter, the, 121.
Pig with six legs, 26.
Pike whale, the, 301.
Pilgrims on board ship, 65.
Poison of scorpion, 140.
Polar Bear, foot of, 34, 75.
Pole, Cardinal, 191.
Porpoise, the, 199.
———— death of, at Brighton, 200.
Potato, sweet, 129.
Pouch of monkey, 331, 337.
——— bustard, 118.
——— near eye of deer, 221.
Prairie hens, 128.
Putts and putchers for catching salmon, 366.

Quail, 128.

Rabbit, skeleton resembling a parrot, 30.
Railways and deer, 240.
Rat with ham-bone round its neck, 101.
—— gnawing lead pipes, 185.
Rats and mice sinking a ship, 109.
—— eaten by Caffres, 18.
Red, effect of, in pictures, 9, 13.
—— deer, 9, 219.
———— habits of, 220.
———— pouch of, 221.
———— brain of, 220.
Relics found in the Serpentine, 160.
Rhinoceros, ice accident to the, 39.
River pearls, 272, 395.
Robinson Crusoe, 62.
Roman coffin, 190.

Saddle-back seal, 307.
Salmon, 15.

Salmon, instruments for catching, 366.
——— jumping at sea, 88.
——— double-headed, 178.
——— growth of, 198.
——— John Hunter's experiments with, 388.
Salt, deer eating, 223.
Sapphirine, gurnard, colours of, 196.
Saw-fish, food of, 278.
——— damage by to telegraph cable, 275.
Scorpion and mouse, fight between, 139.
——— poison of, 140.
Scotland, opening up of, 219, 240.
Sea-horses, 202.
— fish, close time for, 83, 92, 94.
——— spawn of, 83, 92.
— snake, the, 65.
— wonders of the, 217.
Seal, the, 23, 84.
——— track of, 35.
—— fisheries, Greenland, 306.
——— —— Alaska, 319.
——— —— Labrador, 311.
Seals, saddle-back, 307.
—— breeding of, 307.
—— hooded, 308, 315.
—— bladder-nosed, 308, 315.
—— floe, 308.
—— harp, 307.
—— destruction of, 309.
—— fur, the, 318.
—— skin of, 297, 316, 321.
—— at Brighton, 200.
—— fœtal, 295.
—— blubber of, 313.
—— milk of, 319.
—— close time for, 311, 314.
—— oil from, 297, 313.
——— —— in the South Sea, 322.
Sealing ships, 290.
——— ——— the "Eclipse," 295.
Seeds, transportation of, 45.
Sepia, the, 66 (*see* also Octopus and Cuttle-fish).
Serpentine, fish in the, 151.
——— curiosities in the, 159.
Severn, bore on the, 346.
Sharks, thresher, and whales, 70, 85.
Sheep with six legs, 28.
Sheep, malformed hoofs of, 231.
Ship sunk by rats, 109.
Show of cats at Crystal Palace, 252.
Singing mice, 99, 103.
Skeleton, John Hunter's mode of preparing, 384.
——— fossil, 19.
——— of O'Brien the giant, 383.
Skeletons, living, 24.
Skin of walrus, 282.
——— seals, 297, 316.
——— ——— preparation of, 321.
——— snakes, 170.
Skull of walrus, 284.
Slave's collar, 377.
Sleeping fish, 195.
Snake, habits of, 169.
——— eggs of, 174, 175.
——— with two heads, 178.
Solway, bore in the, 359.
Soup from kangaroo's tails, 53.
Southport aquarium, 217.
Spawn of sea-fish, 82.
——— ——— destruction of, 83, 92.
Sporrans of cats' skins, 244.
Sprags or young cod, 92.
"Spring-heeled Jack," 37.
Spur of cock growing in his comb, 389.
Squids, 65 (*see* also Octopus and Cuttle-fish).
Statues, balances to, 54.
Steamers, at night, at sea, 83.
Sting of scorpion, 140.
Stomach of woodpecker, 147.
——— ——— bittern, 149.
Suricate, the, 96.
Suckers of octopus, 206.
Swan, wild, foot of, 36.
Sword-fish and whales, 85.
——— found in the Serpentine, 160.

Tail of beaver, 33.
——— horse, long, 46.
——— kangaroo, 52.
——— wild and tame cats, 244.
——— rat, 53.
——— woodpecker, 145.
——— lizard, 173.
Tankerville wild cattle, 258.

Tartarian lamb, 163.
Teeth of pigs, 189.
——— walrus, 285.
——— monkey, 338.
Telegraph cable injured by a saw-fish, 275.
Temperature of animals and plants, 395.
Tench, tail of, 395.
Tendo Achillis, rupture and union of, 394.
Terrapin, 124.
——— with oyster attached, 125.
Thresher shark and whale, 70, 85.
Tidal waves, 350.
——— at Axminster, 357.
——— at Tynemouth, 365.
Toad, 174.
Tobacco, uses of, 130, 182.
Tongue of woodpecker, 145.
Tooth of saw-fish, 277.
——— transplanted into cock's comb, 392.
Train monkeys, how to, 345.
Transplanting parts of bodies, 392.
Trawlers in the North Sea, 79.
Trees, temperature of, 396.
Turkey, wild, the, 129.
Turtle, 197.
——— oyster attached to, 125.
Tusks of walrus, 284.

Value of sea-fisheries, 93, 95.
——— fresh-water fish, 154.
Voice of wild cat, 245.
——— walrus, 283, 291.
——— seal, 23, 310, 316.
——— elephant, 316.

Walrus, the, 280.
——— eye of, 281.
——— food of, 285, 287.
——— intelligence of, 292.
——— tusks of, 286.
——— skin of, 282.
Walrus, foot of, 283.
——— fœtal, 295.
——— nostrils of, 288.
——— oil from, 286.
Wapiti, the, 129.
War, episode of, 10.
Water in Arctic Sea, colour of, 300.
Waves, tidal, 350.
——— caused by earthquakes, 358.
Whalebone, value of, 200.
Whales in the Pacific, 70.
——— and thresher sharks, 70, 85.
——— and sword-fish, 85.
——— age of, 200.
——— harpoon for, 298.
——— velocity of, 299.
——— food of, 300.
——— pike, the, 301.
——— barnacles from, 302.
Whaling ships, 290.
——— the "Eclipse," 295.
Whiskers of walrus, 283.
White wild cattle, 255.
Wild duck, the, 36.
—— swan, track of, 36.
—— turkey, 129.
—— cats, 243.
——— tail of, 244.
——— in France and Spain, 255.
——— food of, 248.
——— voice of, 245.
——— defeating an army, 246.
——— intestines of, 247.
——— capture of, 250.
—— cattle, white, 255.
——— at Tankerville, 258.
—— goats, 271.
Wing of eagle, 263.
——— penguin, 33, 97.
Wolf hounds, 6.
—— Arctic, foot of, 33.
—— hunting in America, 127.
Wolves' heads, as taxes, 6.
Woodpecker, the, 144.
Wrecks, in the North Sea, 81, 88.

THE END.

BRADBURY, AGNEW, & CO., PRINTERS, WHITEFRIARS.