1
GOWANS'S NATURE BOOKS N°12 6^d NET

SEA-SHORE LIFE

• WALFORD B JOHNSON •
• STANLEY C JOHNSON B.A. •

d
G
ERNEST REID 1906

LONDON & GLASGOW. GOWANS & GRAY LTD

L

1.

d.

G.

Presented by the Executors of
Norman Douglas Simpson

1890 - 1974

27/11/12

Gowans's Nature Books

THE object of these little books is to stimulate a love for nature and a desire to study it.

The first volumes of the series have been extremely successful, and the publishers hope to make the others equally interesting and beautiful.

- No. 1.—WILD BIRDS AT HOME. Sixty Photographs from life, by Chas. Kirk, of British Birds and their Nests.
- No. 2.—WILD FLOWERS AT HOME. First Series. Sixty Photographs from Nature, by Cameron Todd.
- No. 3.—WILD FLOWERS AT HOME. Second Series. By Cameron Todd.
- No. 4.—BUTTERFLIES AND MOTHS AT HOME. Sixty Photographs from life, by A. Forrester.
- No. 5.—WILD BIRDS AT HOME. Second Series, by Charles Kirk.
- No. 6.—FRESHWATER FISHES. Sixty Photographs from life, by Walford B. Johnson and Stanley C. Johnson, B.A.,
- No. 7.—TOADSTOOLS AT HOME. Sixty Photographs of Fungi, by Somerville Hastings, F.R.C.S.
- No. 8.—OUR TREES & HOW TO KNOW THEM. Sixty Photographs by Charles Kirk.
- No. 9.—WILD FLOWERS AT HOME. Third Series. By Somerville Hastings, F.R.C.S.
- No. 10.—LIFE IN THE ANTARCTIC. Sixty Photographs by Members of the Scottish Antarctic Expedition.
- No. 11.—REPTILE LIFE. Sixty Photographs by Walford B. Johnson and Stanley C. Johnson, B.A.
- No. 12.—SEA-SHORE LIFE. By the same.

Others in Preparation

PRICE:

PARCHMENT COVER, 6D. NET. EACH VOLUME.

POSTAGE, 1D. EACH.

GOWANS & GRAY, Ltd., London & Glasgow

The Children's Bookshelf

PRETTY little Books with about a dozen coloured illustrations by well-known artists.

No. 1.—THE UGLY DUCKLING, by Hans Andersen. Coloured illustrations by Stewart Orr.

No. 2.—LITTLE KLAUS AND BIG KLAUS, by Hans Andersen. Coloured illustrations by Charles Pears.

No. 3.—THE PIED PIPER OF HAMELIN, by Robert Browning. Coloured illustrations by Charles Robinson.

No. 4.—THE STORY OF CHANTICLEER. Re-told from Chaucer, by R. Brimley Johnson. Coloured illustrations by Stewart Orr.

PRICE, 6D. EACH IN PARCHMENT COVERS. POST FREE 7D.

GOWANS & GRAY, Ltd., London & Glasgow

Natural History Museum Library

000097205

POCKET ANTHOLOGIES

Compiled by ADAM L. GOWANS, M.A.

36th Thousand.

No. 1.—The Hundred Best Poems (Lyrical) in the English Language.

16th Thousand.

No. 2.—The Hundred Best Poems (Lyrical) in the English Language. Second Series.

11th Thousand.

No. 3.—The Book of Love. One hundred of the best love-poems in the English language.

6th Thousand.

No. 4.—The Hundred Best Blank Verse Passages in the English Language.

Just Published.

No. 5.—Poetry for Children. One hundred of the best poems for the young in the English language.

In Preparation.

No. 6.—The Ways of God. An unconventional anthology of poems on the great problems of existence.

Others In Contemplation.

PRICES :

Paper, 6d. Net.	Cloth, 1s. Net.
Leather, 2s. Net.	Postage, 1d. each.

GOWANS & GRAY, Ltd., London & Glasgow.

Gowans's International Library

NEATLY PRINTED, AND IN PRETTY PARCHMENT COVERS.

No. 1.—*The Haunted and the Haunters*, by Lord Lytton, has been called, and probably is, the best ghost story in the world.

No. 2.—*The Heavenly Footman*, by John Bunyan. A sermon, but one which the picturesque, racy, and thoroughly original style of its great author raises far above the common, and makes as interesting as "*The Pilgrim's Progress*."

No. 3.—*The Marriage Ring*, by Jeremy Taylor. The famous treatise on Marriage and its duties, by one of the very greatest writers of English prose.

No. 4.—*The Lady of Lyons*, by Lord Lytton. This famous play has held the stage since it was first acted. It contains the well-known passage "*A palace lifting to eternal summer*," etc.

No. 5.—*The Tower of Nesle, a Play* by Alex. Dumas the Elder. This romantic play is as intensely exciting and interesting as "*The Three Musketeers*."

No. 6.—*Everyman*. The famous morality play, which is performed so often nowadays.

No. 7.—*Goblin Market and other Poems*, by Christina Rossetti. A reprint of the first edition of 1862. Contains some of the most beautiful lyrics in the language.

No. 8.—*Les Chefs-d'Œuvre lyriques de Ronsard et de son École*. This volume contains all the very best poems of the Pleiad, and the selection has been made by the well-known French poet and critic, M. Auguste Dorchain. A treasure for every student of French literature.

No. 9.—*The Birds of Aristophanes*. The most charming comedy of antiquity.

PRICE, 6D. NET. PER VOLUME. POST FREE 7D. EACH.

Gowans's Art Books

THIS Series, published at a very low price and containing sixty beautifully-printed reproductions of the best pictures of the great masters, is intended to give the lover of art a general idea of the style and characteristics of the most famous painters of the world.

No. 1.—THE MASTERPIECES OF RUBENS.

No. 2.—THE MASTERPIECES OF VAN DYCK.

No. 3.—THE MASTERPIECES OF REMBRANDT.

No. 4.—THE MASTERPIECES OF RAPHAEL.

No. 5.—THE MASTERPIECES OF REYNOLDS,

No. 6.—THE MASTERPIECES OF TENIERS.

No. 7.—THE MASTERPIECES OF THE EARLY
FLEMISH PAINTERS.

No. 8.—THE MASTERPIECES OF TITIAN.

No. 9.—THE MASTERPIECES OF FRANZ HALS.

No. 10.—THE MASTERPIECES OF MURILLO.

No. 11.—THE MASTERPIECES OF WOUWERMAN.

No. 12.—THE MASTERPIECES OF VELAZQUEZ.

Others in Preparation.

PRICES:

PARCHMENT COVER, 6D. NET.

CLOTH, 1S. NET.

LEATHER, 2S. NET.

POSTAGE 1D.

GOWANS & GRAY, Ltd., London & Glasgow

NEW SIXPENNY NET VOLUMES.

Budding Life, A BOOK OF
DRAWINGS,

By JESSIE M. KING.

The Rime of the
Ancient Mariner. COLERIDGE,

Illustrated by STEPHEN REID.

Religion in Common Life.

By PRINCIPAL CAIRD.

The famous sermon which made Principal
CaIRD's reputation.

GOWANS & GRAY, Ltd., London and Glasgow

Humorous Masterpieces

EACH volume contains Sixty of the very best
Drawings of the Masters of Humorous Illustration

READY

No. 1.—PICTURES BY JOHN LEECH
FIRST SERIES

No. 2.—PICTURES BY GAVARNI

No. 3.—PICTURES BY JOHN LEECH
SECOND SERIES

No. 4.—PICTURES BY ROBERT SEYMOUR

Others in Preparation

PRICE 6d. NET EACH VOLUME (POST FREE 7d.)

GOWANS & GRAY, Ltd., London and Glasgow

JUST PUBLISHED.

SECOND EDITION.

Revised and Enlarged.

SCOTLAND

PICTURESQUE AND TRADITIONAL.

BY GEORGE EYRE-TODD.

With 56 Illustrations from recent Photographs.

A most interesting and delightful account of the history and legends connected with the most romantic spots in Scotland. Every page recalls memories and traditions that have a lasting place in every true Scotsman's heart.

CROWN 8VO. 381 PP., 3/6 NET.

POST FREE, 3/10.

GOWANS & GRAY, Ltd., Glasgow & London

GOWANS'S NATURE BOOKS, No. 12

SEA-SHORE LIFE

CARSON & NICOL, PRINTERS GLASGOW.

BLOCKS BY HISLOP & DAY, EDINBURGH.

GREEN SHORE CRAB
(*Carcinus Maenas*)

W. B. & S. C. Johnson, Photo.

SEA-SHORE LIFE

*Sixty photographs from life by Walsford B. Johnson and
Stanley C. Johnson, M.A.*

GOWANS & GRAY, LTD.
5 ROBERT STREET, ADELPHI, LONDON, W.C.
58 CADOGAN STREET, GLASGOW
1907

AGENTS FOR THE SALE OF THIS SERIES

France: A. Perche, 45 Rue Jacob, Paris.

Germany: W. Weicher, Windmühlentweg, I. III, Leipzig.

Switzerland: E. Frankfurter, 12 Grand-Chêne, Lausanne.

Belgium: Spincx & Cie, 3 Rue du Bois-Sauvage, Brussels.

Scandinavia: A. & O. Schedin, Lund, Sweden.

Spain and Portugal: Ferreira & Oliveira, Lda, Rua do Ouro 32, Lisbon.

Holland: Kirberger & Kesper and Jacobs, G. Robbers, Amsterdam.

„ *A. Abrahams, The Hague.*

THE creatures figured in the following illustrations may all, as Mr. Johnson points out in his notes at the end of this booklet, be found on British shores during the summer months. The volume will therefore form a useful pocket companion for visitors on holiday at the coast.

A STRANDED JELLY-FISH
(*Aurelia aurita*)

W. B. Johnson, Photo.

BEADLET SEA ANEMONE
[WITH TENTACLES EXPANDED]
(*Actinia mesembryanthemum*)

W. B. Johnson, Photo.

BEADLET SEA ANEMONE
[TENTACLES WITHDRAWN]

W. B. Johnson, Photo.

BEADLET SEA ANEMONE
[WITH TENTACLES RETRACTED]
LEFT BY THE TIDE

W. B. Johnson, Photo.

COMMON FIVE-FINGERED STARFISH
(*Asterias rubens*)

W. B. Johnson, Photo.

COMMON STARFISH
[UNDERSIDE]

W. E. Johnson, Photo.

FOUR-FINGERED STARFISH
(*Asterias rubens*)

W. B. Johnson, Photo.

NOTCHED WRACK COVERED WITH SHELLS
OF A MARINE WORM
(*Spirorbis*)

W. B. Johnson, Photo.

EDIBLE COCKLES IN THE SAND
(*Cardium edule*)

W. B. Johnson, Photo.

EDIBLE COCKLES OVERGROWN WITH
SEA GRASS

IV. B. Johnson, Photo.

EDIBLE MUSSEL
(*Mytilus edulis*)

W. B. & S. C. Johnson, Photo.

W. B. & S. C. Johnson, Photo.

A CLUSTER OF MUSSELS

WHELK
(*Buccinum undatum*)

IV. B. & S. C. Johnson, Photo.

WHELK

W. B. & S. C. Johnson, Photo.

EGG CASES OF COMMON WHEELK

W. B. Johnson, Photo.

LIMPETS ON A ROCK
(*Patella vulgata*)

W. B. & S. C. Johnson, Photo.

COMMON LIMPET CRAWLING ON THE GLASS SIDE
OF THE AQUARIUM

W. B. & S. C. Johnson, Photo.

IV. B. & S. C. Johnson, Photo.

PERIWINKLE
(*Littorina littorea*)

PERIWINKLE

W. B. Johnson, Photo.

PERIWINKLE

W. B. & S. C. Johnson, Photo.

VARIEGATED PERIWINKLE
(*Littorina littorea*)

W. B. Johnson, Photo.

COMMON DOG-WINKLE
(*Purpura lapillus*)

IV. B. & S. C. Johnson, Photo.

COMMON DOG-WINKLE
[Puccinotiops helix]

W. B. & S. C. Johnson, Photo.

PEARLY TOPS
(*Trochus zizyphinus*)

W. B. Johnson, Photo.

COMMON OYSTER
(*Ostrea edulis*)

W. B. Johnson, Photo.

OYSTER GROWN ON TO AN EMPTY
MUSSEL SHELL

W. B. & S. C. Johnson, Photo.

SHELL OF RAZOR-FISH
(*Solen ensis*)

W. B. Johnson, Photo.

A CLUSTER OF ACORN
BARNACLES
(*Balanus porcatus*)

W. B. & S. C. Johnson, Photo.

ACORN BARNACLES
[FIXED TO COMMON MUSSEL]

W. B. Johnson, Photo.

LOBSTER
(*Homarus vulgaris*)

W. B. & S. C. Johnson, Photo.

LOBSTER AS SEEN WHEN AT HOME

W. B. & S. C. Johnson, Photo.

COMMON PRAWN
(*Palaemon serratus*)

W. B. Johnson, Photo.

COMMON SHRIMP
(*Crangon vulgaris*)

W. B. Johnson, Photo.

COMMON SHRIMP
[DORSAL VIEW]

W. B. Johnson, Photo.

HERMIT CRAB IN A WHELK SHELL
(*Pagurus bernhardus*)

W. B. & S. C. Johnson, Photo.

HERMIT CRAB IN A PERIWINKLE SHELL

W. B. & S. C. Johnson, Photo.

HERMIT CRAB IN SHELL OF DOG-WINKLE

W. B. Johnson, Photo.

THORNBACR CRAB
(*Maia squinado*)

IV. B. & S. C. Johnson, Photo.

SPIDER CRAB
(*Hyas coarctatus*)

W. B. Johnson, Photo.

SPIDER CRAB [UNDERSIDE]

W. B. Johnson, Photo.

GREEN SHORE CRAB
(*Carcinus maenas*)

W. E. Johnson, Photo.

SHORE CRAB BURYING ITSELF IN THE SAND

W. B. & J. C. Johnson, Photo.

GREEN SHORE CRAB
[UNDERSIDE]

W. B. Johnson, Photo.

EDIBLE CRAB
(*Cancer pagurus*)

W. B. Johnson, Photo.

VELVET SWIMMING CRAB
(*Portunus puber*)

W. B. Johnson, Photo.

VELVET SWIMMING CRAB

IV. B. & S. C. Johnson, Photo. -

VELVET SWIMMING CRAB
[UNDERSIDE]

W. B. Johnson, Photo.

FIVE-BEARDED ROCKLING
(*Motella mustela*)

W. B. & S. C. Johnson, Photo.

RAINBOW WRASS
(*Labrus julis*)

W. B. & S. C. Johnson, Photo.

SMOOTH BLENNY
(*Blennius pholis*)

W. B. Johnson, Photo.

SMOOTH BLENNY

W. B. Johnson, Photo.

TANGLE SEAWEED
(*Laminaria digitata*)

W. B. & S. C. Johnson, Photo.

BLADDER WRACK
(*Fucus vesiculosus*)

W. B. Johnson, Photo.

BLADDER WRACK

W. B. & S. C. Johnson, Photo.

NOTCHED WRACK
(*Pucus serratus*)

W. B. Johnson, Photo.

NOTCHED WRACK

W. B. & S. C. Johnson, Photo.

KNOTTED WRACK
(*Fucus nodosus*)

W. B. Johnson, Photo.

CHANNELLED WRACK
(*Fucus canaliculatus*)

IV. B. Johnson, Photo.

SEA GRASS
(*Enteromorpha compressa*)

W. B. Johnson, Photo.

SOME Notes ^{on} the Sea-Shore Objects

OF WHICH
PHOTOGRAPHS APPEAR IN
THE FOREGOING PAGES. .

BY
WALFORD B. JOHNSON.

ALL the creatures figured in the illustrations may be found on British shores during the summer months. The best time to search for them is at low water when the moon is full or new, as then the maximum stretch of sand will be left by the receding tide.

Jelly-fish.—During the summer months it is a common sight to see numbers of circular gelatinous masses floating on the waves in the neighbourhood of the shore. Each one has four white rings arranged round the centre of the “umbrella.” If this creature be viewed laterally it will be seen that there hang down from the dome four somewhat twisted ribbon-like appendages. Jelly-fish seem incapable of directing their own course but are washed about wherever the currents take them. They are exceedingly low down in the scale of life for they consist of a very slight membrane whose pores are tensely filled out with water. If one of these creatures be exposed to the sun’s rays for a few hours the contained water will evaporate and nothing will remain save a very small silvery mark like that left by a slug or snail when crawling over the ground.

Beadlet Sea Anemone.—A careful search among the lower reefs when the tide is out will reveal a number of jelly-like objects firmly sticking to the under surface of the rocks. Some are bright red, others green, while a third set are closely spotted with brown on a red background. All three are varieties of the Beadlet Sea Anemone which abound on most of our rocky shores. When left by the tide their appearances are not very striking, but when submerged they stretch out a number of tentacles in search of food. In this latter position these creatures bear some resemblance to a flower with full-blown petals. It is this which has earned for them the title of sea flowers or sea anemones. When a shrimp or a sand-hopper swims over the expanded tentacles of one of these creatures and happens to touch them, it is immediately held fast while the anemone slowly closes dragging the unfortunate victim within its body. When the shrimp is digested the tentacles are again protruded in search of a further meal.

Common Star-fish.—It would be a difficult matter to go to the sea-shore at low-tide without seeing several of these creatures. They usually congregate under rocks or masses of sea weed to await the return of the water. On the upper side the common five fingered variety is a reddish colour and particularly rough to the touch. Underneath it is provided with a very large number of tentacles, which enable it to creep over rocks as well as to cling and hold on to its food. If one of these creatures be turned over on its back, it will, by the aid of its tentacles, slowly and deliberately right itself. The process is very interesting. Occasionally one sees a specimen which has only four limbs; the fifth was not hitten off, but the creature was horn so. Star-fish are scavengers feeding on dead fish and animal refuse generally.

Marine Worms. [Spirorhis.]—On turning over the sea-weed while searching for marine animals one frequently finds some of it covered with a large number of spiral shell-like structures. These are the tunnels of tiny marine worms. Oyster, mussel and scallop shells are often seen with these tubes dotted over their surfaces.

Edible Cockle.—The cockle is so well known that a description of its shape and colour would be superfluous here. In a state of nature it usually lies just buried in the sand. However, in such sheltered places as the estuaries of rivers where the sea is never very hoisterous it seems to prefer to remain above the sand loose among the stones, where it becomes over-grown with sea-weeds. A number of empty shells lying flat on the sand usually indicates the whereabouts of a colony of cockles. When collected for food they are scraped out of the mud with wooden rakes. If one of these "shell-fish" be placed in some sea water after a time it will protrude a mass of flesh called the "foot." This organ serves the animal the dual purpose of anchoring it and moving it slowly through the sand.

Edible Mussel.—In some places these creatures are so plentiful that the rocks which form their support are literally covered with them. If one of these molluscs be carefully pulled away from its fellows, a mass of thread-like sinews will be seen hanging from its shell. This is known as the "byssus" or foot of the creature which fixes it firmly to the rocks. When left high and dry by the tide the shells are kept tightly closed, but when submerged they slightly open and a structure is put out which has somewhat the appearance of a lace frill round the edge of the shell. This creature is largely used for food in some classes of society, but on many people it has a very deleterious effect.

Whelk.—All the creatures so far described have no distinct head but obtain their food supply by inhaling a stream of sea-water and filtering out what they require. As all the edible particles are extracted the water is expelled. The whelk, on the other hand, has a simple bead and a mouth which is provided with a very file-like tongue. With this member it is able to wear away the shells of smaller creatures and feast on their living contents. The shells of whelks, winkles and several other univalves are closed by caps or opercula which are fixed to the tails of the creatures. When crawling these caps will be seen on the hindmost part of the animals just below the shells. Whelks are horn from eggs which are enclosed in horny cases, numbers being fixed together on a common stalk. When all the young are hatched the case breaks off its support, and numbers of them are then washed ashore. The illustration shows one of these about natural size.

Limpet.—These molluscs are plentiful on almost every shore where there are rocks which are regularly covered and left by the tide. If given a sudden sharp tap they are easily dislodged, but when they have warning of danger their shells may be smashed to pieces before they will release their hold. When left by the receding tide they often crawl slowly over the seaweed and rocks in search of food. Our second illustration of limpets shows one moving on the glass side of an aquarium. In this position it will be seen to have a mouth and two horns somewhat like those of an ordinary terrestrial snail.

Periwinkle.—One of the commonest molluscs of our coasts is the ordinary periwinkle. It occurs as several varieties, some a dull bluish colour, others reddish brown, while still another form is banded with brown and yellow. It feeds on all kinds of healthy and decaying seaweed.

Dog Winkle.—While searching among the seaweed at low tide a large number of small whelk-like shells are sure to be discovered, some quite dormant, others being dragged over the rocks by their hungry owners in search of food. Many of these will be a dazzling white, others a yellowish hue, while a third group will be of quite a sombre brownish tint. However, all these belong to the same species, in spite of the great diversity of colour displayed, and are the common dog winkle.

Pearly Tops.—These shells owe their common name to the likeness they bear to a pyramid, or an inverted top. They are easily distinguished by their shape and the similarity of the mouth of the shell to mother of pearl.

Oyster.—This mollusc is so well known as an article of diet that a description here would be superfluous. Those required for market are dredged up when quite young from the natural beds which lie at some depth below the surface. From there they are transferred to artificially prepared shallow banks, where they are allowed to grow until again dredged up for "Whitstable Natives."

Razor-fish.—On many a gravelly beach, when the tide is low, a number of yellowish-pink elongated shells may be seen lying embedded in the sand. The popular name has been derived from their fanciful resemblance to the handle of a razor. Sometimes there are literally thousands of these shells, some in a more or less good state of preservation; but as they are extremely fragile, the majority are hopelessly broken. Though so many shells are about, not one of them will be found tenanted. The animals which dwell in them are exclusively subterranean, living in vertical burrows in the sand. When the tide covers them they are very near the surface, but when the sands are high and dry they retreat to the further extremity of their hole. Their homes are usually marked by little punctures in the sand. Through these they frequently squirt tiny jets of water in their hurried retreat from the surface if it be shaken by the approach of a possible enemy. Razor-fish make splendid bait, and are often used for human food.

Acorn Barnacles.—Every visitor to the sea-side who has made any excursions among the rocks is sure to have noticed the myriads of tiny whitish shells which so often cover them. They fix themselves to rocks, the shells of molluscs and crabs, and even sea-weed, and in such numbers that they often completely cover their host. If one of these be carefully observed, it will be noticed that there is a sort of roof divided down the middle. While left dry the shell is kept

shut, but when the tide returns the roof-like structure opens and the "casting nets" as seen in our illustration, are protruded and withdrawn incessantly. These feathery appendages are the means by which the barnacle obtains its food, for they are constantly combing out of the water the microscopic animals which exist in millions in the sea.

Lobster.—To the town dweller the word "lobster" induces thoughts of a skewer, a mat-basket and a fiery-red creature, reposing on its tail. But how similar is this scarlet object to that animal when it was in the sea and "monarch of all it surveyed?" Then our lobster was a deep prussian blue colour delicately mottled with pinkish white. There it crawled over and under the rocks in search of food until one day it found a very tempting morsel right inside a lobster-pot. Shortly after that it quitted the ocean for ever and finished its earthly career in the usual way. Whenever a lobster is threatened with danger, instead of rushing forward to escape, it stretches out wide its tail and curves it under its body with such a jerk that the creature flies backwards for a foot or more with amazing rapidity. If still threatened this process is repeated until, still backwards, it reaches some retreat into which it clumsily shuffles, leaving only the formidable pincers visible. From this position it is very difficult to dislodge, if only a frontal attack be possible.

Common Prawn and Shrimp.—Like the lobster, the prawn completely changes its colour during the culinary process, turning from a transparent bluish to an opaque reddish tint. The shrimp, on the other hand, becomes a dark brown colour on boiling. Hosts of young prawns are captured annually and sold as shrimps; but these are invariably pink, while the true shrimps are always a greyish brown when cooked. Prawns delight in weedy rock pools, while shrimps prefer sandy areas. The two may be distinguished from one another quite easily when it is remembered that the prawn's head is furnished with a sawlike horn, while that of the shrimp lacks anything of this nature. The bodies of dead animals constitute their chief food.

Hermit Crab.—It is quite a common sight to see a whelk, or perhaps a winkle, travelling along the bottom of some rock-pool at a surprising rate for so sluggish an animal. If picked up the supposed whelk will immediately seek refuge in the most remote part of the spiral shell, leaving the unmistakable pincers of some crustacean exposed to view. This creature is the Hermit Crab, whose body is so soft that it is obliged to protect it by living in the cast-off shell of some mollusc. The limbs are quite hard, like those of other crabs, but the body is merely covered by a soft skin. This crustacean manages to hold on to its house by means of powerful clinging appendages on its tail. Wherever the hermit wanders the shell accompanies it, for it never quits its domicile until it has outgrown it and found a better.

Thornback and Spider Crabs.—These two crustaceans are similar in appearance, but the pincers are very long in the former, while in the latter they are rather small. Both are admirably protected when crawling about among the seaweeds at the bottom of the sea, for their backs and the dorsal portions of their limbs are densely covered with short stiff bristles. These hairs, in course of time, become clogged with the growing fronds of marine plants, minute sponges and acorn barnacles. When covered in this way, it is a very difficult task to discover one of these creatures in its habitat, especially in the uncertain light which prevails at that depth of water.

Green Shore Crab.—Familiar to every visitor to the sea-shore is this common crustacean. It abounds in either rocky or sandy districts and even in estuaries where the water is brackish it is fairly common. In many places it is difficult to turn over a bunch of seaweed or a small rock without disturbing several. These scamper off to the nearest cover, or, by a shuffling motion of their legs, proceed to bury themselves in the sand. All the time their formidable pincers are held stretched out ready for the disturber of their peace should he venture within reach. These crabs will live several months if taken home and placed in sea water with a good number of stones under which to hide. They may be fed on small pieces of lean meat or on fish which they will greedily devour, fighting and tumbling over one another in their efforts to obtain the food. Of course if this meat be thrown into the water the latter will soon become foul. The crabs then, should be placed in some vessel out of which they cannot climb and the food given them there. Care should be taken that the vessel, crabs and meat, are all very wet, though they need not be wetted with sea-water. After remaining in there for some two hours the crabs may be taken out, rinsed under the tap and returned to the sea-water. As they are always hungry, even after a heavy meal, the feeding should be as often as the patience of their owner will permit.

Edible Crab.—This species, though it grows to a considerable size, seems to be one of the least pugnacious of all the crabs. When disturbed it usually tries to roll itself up into a ball to pretend it is dead and therefore worthless. Small specimens may often be found lying under large stones at low water. But the large ones never seem to allow the tide to leave them. Their colour is a dull brick-red above and yellowish below and when boiled these shades merely become a little brighter.

Velvet Swimming Crab.—All the crabs so far described spend their time in crawling over the stones and weeds, and are quite incapable of raising themselves in the water. If one of them were to walk off the edge of a submerged rock it would slowly sink to the bottom, though the creature would be able to swim a short distance while it was sinking. The velvet crab, on the other hand, can paddle through the water comparatively easily by means of the flattened bases of its hind legs. Its colour is greyish, generally delicately outlined with deep violet. The dense covering of short hair on its upper parts have earned for it the popular name of Velvet Crab.

Five-bearded Rockling.—This is a very common little fish which inhabits our rugged shores. If a small rock surrounded by a pool be lifted or turned over, it is quite likely that a rockling or two will be discovered in hiding there while the tide is out. Sometimes they may even be found under bunches of wet seaweed waiting for the return of the water. These fish have four barbules on the upper lip and a single one on the lower, and they are so slimy and smooth that they are almost as difficult to hold as an eel. Their colour is generally blackish-brown on the back, shading off to silvery white on the lower parts.

Rainbow Wrasse.—Wrasses are brightly-coloured little fishes which occur in plenty off our coasts where there are sufficient rocks to afford them cover. As the popular name suggests their colours are very varied and bright. Usually the body is marked by sky-blue lines of colour and the eye is enclosed by a rich red circle.

Smooth Blenny.—A hand net swiftly passed among the bunches of sea-weed on the edges of rock-pools usually secures a few specimens of the smaller shore-loving fishes. In this manner smooth blennies may often be obtained in plenty. Sometimes they are discovered under rocks left high and dry by the tide and there they remain quite contentedly until the water returns. In colour these fish vary considerably. Some being almost mustard-yellow blotched with light brown, while others are nearly black and devoid of markings. If, however, these dark varieties be placed in a light-coloured vessel of water their shades will quickly become much lighter. These creatures by some means are able to change their general colouration to more or less harmonise with that of their environment. The eyes of blennies, which are outlined by a deep red ring, can be moved quite independently of one another like those of a chameleon. Often there are tentacles on the head which enable them to anchor themselves to any object and by means of the under fins these fish can cling to pieces of sea-weed or rocks or stones.

Sea Grass.—This is the popular name for the bright green mossy looking sea-weed which densely covers all the permanent hard substances which are regularly washed by the tides. It is composed of multitudes of single rootless filaments, each with a fixing base, which derive their nutriment, like almost all sea-weed, by absorption from the water through the green ribbon-like structures.

Tangle Sea-Weed is usually restricted to the deep water just beyond low tide mark, but often after storms a great deal is thrown up on to the beach. The deep brown plants frequently measure six or more feet and consist of a broadened fixing base and a cylindrical tough stem which at the apex flattens out into a number of ribbon-like strands. This rough resemblance it bears to bovine extremities has given it the name of cow's tail sea-weed in some districts.

Bladder Wrack, Notched Wrack, Knobbed Wrack, and Channelled Wrack are all found growing in company with one another on rocks, piles, etc. For their reproduction they require to be left exposed to the air for some hours at regular intervals, so that they are never found beyond the tide marks. All except Knobbed Wrack are deep brown in colour and much branched, absorbing their food supply direct from the water as already explained. **Bladder Wrack** is easily distinguished by the presence of a mid-rib and a number of swellings or vesicles which help to buoy up the plant when submerged; **Notched Wrack**, by the serrated or notched edges of its fronds; **Knobbed Wrack**, by the yellowish colour and absence of any trace of a mid-rib; and **Channelled Wrack**, by its particularly narrow, much-branched fronds.

Miscellaneous Sixpennies.

COMMONSENSE CHRISTIANITY.

An attempt to describe in simple words what Christianity as taught by Christ really is.

PARCHMENT COVERS, 6D. NET ; POSTAGE, 1D.

THE PLEASURES of Mr. BRIGGS,

Described and Illustrated By John Leech.

These famous drawings from *Punch*.

PARCHMENT COVERS, 6D. NET ; POSTAGE, 1D.

THE BOTTLE,

In Sixteen Plates. Designed and Etched by

GEORGE CRUIKSHANK:

A very daintily produced little edition of those famous etchings.

PARCHMENT COVERS, 6D. NET ; POSTAGE, 1D.

GOWANS & GRAY, Ltd., London & Glasgow

Gowans's Books for the Young

A SERIES of prettily got up little volumes containing old favourites and other books sure to become favourites,

Ready.

No. 1.—THE SEVEN CHAMPIONS OF CHRISTENDOM. By W. H. G. Kingston.

No. 2.—THE HEROES. Greek Fairy Tales for my Children, by Charles Kingsley.

No. 3.—THE STORY OF PRINCE AHMED AND THE FAIRY PERIE BANOU (from the Arabian Nights).

Others in Contemplation.

PRICE: PICTURE BOARDS, CLOTH BACK, 6D. NET.
POSTAGE, 1D.

GOWANS & GRAY, Ltd., London and Glasgow