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John George Wood

Excerpt

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NAUTICAL.

CHAPTER I.

Poetry and Science.—The Paper Nautilus and the Sail.—Montgomery's "Pelican Island."—The Nautilus replaced by the Velella.—The Sailing Raft of Nature and Art.—Description of a Velella Fleet off Tenby.—The Natural Raft and its Sail.—The Boats of Nature and Art.—Man's first Idea of a Boat.—The Kruman's Canoe and the *Great Eastern*.—Gradual Development of the Boat.—The Outrigger Canoe a Mixture of Raft and Boat.—Natural Boats.—The Water-snails.—The Sea-anemones.—The Egg-boat of the Gnat.—The Skin-boat of the same Insect.—Shape and Properties of the Life-boat anticipated in Nature.—Natural Boat of the Stratiomys.

THE RAFT.

IT has been frequently said that the modern developments of science are gradually destroying many of the poetical elements of our daily lives, and in consequence are reducing us to a dead level of prosaic commonplace, in which existence is scarcely worth having. The first part of this rather sweeping assertion is perfectly true, but, as we shall presently see, the second portion is absolutely untrue.

Science has certainly destroyed, and is destroying, many of the poetic fancies which made a part of daily life. It must have been a considerable shock to the mind of an ancient philosopher when he found himself deprived of the semi-spiritual, semi-human beings with which the earth and water were thought to be peopled. And even in our own time and country there is in many places a still lingering belief in the existence of good and bad fairies inhabiting lake, wood, and glen, the successors of the Naiads and Dryads, the Fauns and Satyrs, of the former time. Many persons will doubtless be surprised, even in these days, to hear that the dreaded Maelström is quite as fabulous as the Symplegades or Scylla and

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NATURE'S TEACHINGS.

Charybdis, and that the well-known tale of Edgar Poe is absolutely without foundation.

Perhaps one of the prettiest legends in natural history is that of the Paper Nautilus, with which so much poetry is associated. We have all been accustomed from childhood to Pope's well-known lines beginning—

“Learn of the little Nautilus to sail,”

and some of us may be acquainted with those graceful verses of James Montgomery, in his “Pelican Island :”—

“Light as a flake of foam upon the wind,
Keel upward, from the deep emerged a shell,
Shaped like the moon ere half her horn is filled.
Fraught with young life it righted as it rose,
And moved at will along the yielding water.
The native pilot of this little bark
Put out a tier of oars on either side,
Spread to the wafting breeze a two-fold sail,
And mounted up and glided down the billow
In happy freedom, pleased to feel the air,
And wander in the luxury of light.
* * * * *
It closed, sank, dwindled to a point, then nothing,
While the last bubble crowned the dimpling eddy
Through which mine eye still giddily pursued it.”

So deeply ingrained is the poetical notion of the sailing powers attributed to the nautilus, that many people are quite incredulous when they are told that there is just as much likelihood of seeing a mermaid curl her hair as of witnessing a nautilus under sail. How the creature in question does propel itself will be described in the course of the present chapter; and the reader will see that although one parallel between Nature and Art in the nautilus does not exist, there are several others which until later days have not even been suspected.

It is, therefore, partially true that science does destroy romance. But, though she destroys, she creates, and she gives infinitely more than she takes away, as is shown in the many late discoveries which have transformed the whole system of civilised life. Sometimes, as in the present instance, she discovers one analogy while destroying another, and though she shatters the legend of the sailing nautilus, she produces a marine animal which really does sail, and does not appear to be able to do anything else. This is the VELELLA, a

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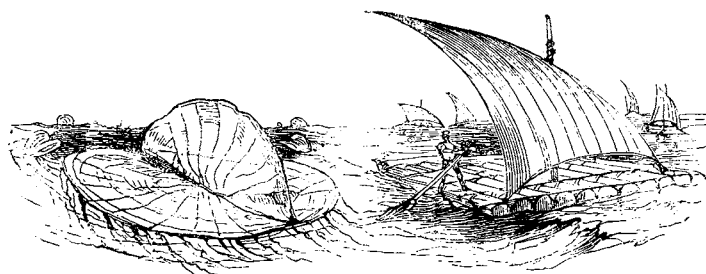
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THE VELELLA AND SAILING RAFT.

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figure of which, taken from a specimen in my collection, is given in the illustration, and drawn of the natural size.

It is one of that vast army of marine creatures known familiarly by the name of "jelly-fishes," just as lobsters, crabs, shrimps, oysters, whelks, periwinkles, and the like, are lumped together under the title of "shell-fish." As a rule, these creatures are soft, gelatinous, and, in fact, are very little more than sea-water entangled in the finest imaginable mesh-work of animal matter; so fine, indeed, that scarcely any definite organs can be discovered. The Velella, however, is



VELELLA (NATURAL SIZE).

SAILING RAFT.

remarkable for having a sort of skeleton, if it may be so called, consisting of two very thin and horny plates, disposed, as shown in the illustration, so as to form an exact imitation (or perhaps I should say a precursor) of a raft propelled by a sail. Indeed, the Latin name Velella signifies a little sail.

How well deserved is the name may be seen by the following graphic account of a Velella fleet sent to me by a lady who takes great interest in practical zoology:—

“The specimens which I send came from Tenby, a very rough sea having driven a large living fleet of them on that coast.

“When in life, they are semi-transparent, and radiant in many rainbow-tinted colours. They came floating towards me in all their fragile beauty on the rough sea waves. I succeeded in capturing some of them, and preserved the only portion available for my collection.

“They are extremely tender, and by no means with which I am acquainted can be preserved more than these skeleton-like cartilaginous plates. They soon dissolve in either spirits of wine or water, and lose every vestige of their shape and

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substance. The upright, thin, pellucid plate has the appearance of a fairy-like miniature sail, and apparently acted as such when the creature was floating with its long and many-tinted tentacles pendent from its lower surface.

“Although widely distributed, they are seldom seen on our own coast, although sometimes driven there from the warmer regions by stress of wind and waves.

“These little creatures had never before been seen at Tenby, but when I asked a native bathing-woman whether she knew their name, she immediately replied, ‘Sea-butterflies.’ Although the name was evidently of her own invention, it was most appropriate and poetical. I have always found the Welsh people abound more than any other nation in pretty and characteristic synonyms.”*

In answer to a letter in which I asked the writer for some further information concerning the *Veella*, sending also an outline sketch of the animal, which I asked the writer to fill in with the proper colours, I received the following reply:—

“I will do my best to answer your questions, and to give you what information I can concerning the creatures.

“When seen at Tenby, they were all floating on the surface of the sea, the tentacles only being submerged. My specimens floated for a very short time after capture, death following so quickly that I was obliged to set to work at once with camel’s-hair brush and penknife to take away the gelatinous part. Indeed, decomposition took place so rapidly, that *Veellas* and myself were simultaneously threatened with extermination.

“Both raft and sail were equally enveloped in a soft, gelatinous covering, certainly not more than the sixteenth of an inch in thickness, except under the centre of the raft, where it became slightly thicker. The covering of the sail was exceedingly thin, and like a transparent and almost invisible soft skin. The sail is very firmly attached to the raft, as they did not separate when decomposition began.

“The tentacles were entirely composed of the same soft, jelly-like substance as that of the envelope, and every part was iridescent in a sort of vapoury transparent cloud of many-tinted colours, blue and pale crimson predominating. I have

* By sailors the *Veella* is popularly known by the name of “Sally-man;” *i.e.* Sallee-man.

filled up to the best of my memory the little sketch, and only wish you could have seen the *Velellas* as I did, in their full life and beauty."

Two of the specimens here mentioned are in my collection, and beautiful little things they are. The two plates are not thicker than ordinary silver paper, but are wonderfully strong, tough, and elastic. The oval horizontal plate, or raft, if it may be so called, is strengthened by being corrugated in concentric lines, and having a multitude of very fine ribs radiating from the centre to the circumference. It is slightly thickened on the edges, evidently for the attachment of the tentacles.

The perpendicular plate, or sail, does not occupy the larger diameter of the raft, but stretches across it diagonally from edge to edge, rising highest in the centre and diminishing towards the edges, so that it presents an outline singularly like that of a lateen sail. It is rather curious that the magnifying glass gives but little, if any, assistance to the observer, the naked eye answering every purpose. Even the microscope is useless, detecting no peculiarity of structure. I tried it with the polariscope, scarcely expecting, but rather hoping, to find that it was sensitive to polarised light. But no such result took place, the *Verella* being quite unaffected by it.

The corresponding illustration is a sketch of a raft to which a sail is attached. Such rafts as this are in use in many parts of the world, the sail saving manual labour, and the large steering oar answering the double purpose of keel and rudder. In the *Verella*, the tentacles, though they may not act in the latter capacity, certainly do act in that of the former, and serve to prevent the little creature from being capsized in a gale of wind.

THE BOAT.

THERE is no doubt that the first idea of locomotion in the water, independently of swimming, was the raft; nor is it difficult to trace the gradual development of the raft into a Boat. The development of the *Kruman's* canoe into the *Great Eastern*, or a modern ironclad vessel, is simply a matter of time.

It is tolerably evident that the first raft was nothing more than a tree-trunk. Finding that the single trunk was apt to

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turn over with the weight of the occupant, the next move was evidently to lash two trunks side by side.

Next would come the great advance of putting the trunks at some distance apart, and connecting them with cross-bars. This plan would obviate even the chance of the upsetting of the raft, and it still survives in that curious mixture of the raft and canoe, the outrigger boat of the Polynesians, which no gale of wind can upset. It may be torn to pieces by the storm, but nothing can capsize it as long as it holds together.

Laying a number of smaller logs or branches upon the bars which connect the larger logs is an evident mode of forming a continuous platform, and thus the raft is completed. It would not be long before the superior buoyancy of a hollow over a solid log would be discovered, and so, when the savage could not find a log ready hollowed to his hand, he would hollow one for himself, mostly using fire in lieu of tools. The progress from a hollowed log, or "dug-out," as it is popularly called, to the bark canoe, and then the built boat, naturally followed, the boats increasing in size until they were developed into ships.

Such, then, is a slight sketch of the gradual construction of the Boat, based, though perhaps ignorantly, on the theory of displacement. Now, let us ask ourselves whether, in creation, there are any natural boats which existed before man came upon the earth, and from which he might have taken the idea if he had been able to reason on the subject. The Paper Nautilus is, of course, the first example that comes before the mind; but although, as we have seen, the delicate shell of the nautilus is not used as a boat, and its sailing and rowing powers are alike fabulous, there is, as is the case with most fables, a substratum of truth, and there are aquatic molluscs which form themselves into boats, although they do not propel themselves with sails or oars.

Many species of molluscs possess this art, but we will select one as an example of them all, because it is very plentiful in our own country, and may be found in almost any number. It is the common WATER-SNAIL (*Limnæa stagnalis*), which abounds in our streams where the current is not very strong. Even in tolerably swift streams the *Limnæa* may be found plentifully in any bay or sudden curve where a reverse current is generated,

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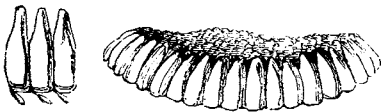
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NATURAL AND ARTIFICIAL BOATS.

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and therefore the force of the stream is partially neutralised. These molluscs absolutely swarm in the Cherwell, and in the multitudinous ditches which drain the flat country about Oxford into that river as well as the Isis.

Belonging to the Gasteropods, the Water-snail can crawl over the stones or aquatic vegetation, just as the common garden snail or slug does on land. But it has another mode of progression, which it very often employs in warm weather. It ascends to the surface of the water, reverses its position so



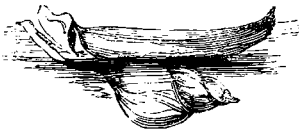
GNAT-EGG BOAT AND THREE EGGS.



"DUG-OUT" BOAT OF VARIOUS PARTS OF THE WORLD.



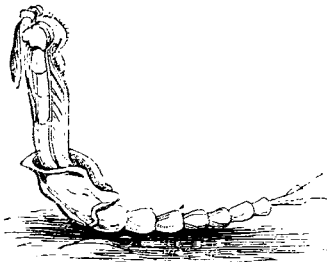
SEA-ANEMONE ACTING AS BOAT.



WATER-SNAIL ACTING AS BOAT.



BIRCH-BARK CANOE.



PUPA SKIN OF GNAT ACTING AS BOAT.

that the shell is downward, spreads out the foot as widely as possible, and then contracts it in the centre, so as to form it into a shallow boat.

The carrying capacity of this boat is necessarily small, but as the shell and nearly the whole of the animal are submerged, and therefore mostly sustained by the water, a very small amount of flotative power is sufficient for the purpose. Some-

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times, on a fine day, whole fleets of these natural boats may be seen floating down the stream, thus obtaining a change of locality without any personal exertion.

In perfectly still water, where no current can waft the *Limnæa* on its easy voyage, it still is able to convey itself from one place to another. By means of extending and contracting the foot, it actually contrives to crawl along the surface of the water almost as readily as if it were upon the under side of some solid body, and, although its progress is slow, it is very steady. Another very common British water-snail, the Pouch-shell (*Physa fontinalis*), has almost exactly the same habits. Reference will be made to the Pouch-shell on another page.

The capacity for converting the body into a boat is not confined to the molluscs, but is shared by many other animals. Take, for example, the well-known marine animals, called popularly SEA-ANEMONES. As they appear when planted on the rocks, they look as incapable of motion as the flowers whose names they bear. Yet, by means of the flattened base, which they use just as a snail uses its feet, they can manage to glide along the rocks in any direction, though very slowly.

The base is capable of extension and contraction, and by elongating one side of it, fixing the elongated portion, and then raising the remainder of the base towards it, the animal makes practically a series of very slow steps. This mode of progression may often be seen in operation on the glass front of an aquarium.

The same property of expansion and contraction enables the Sea-anemones to convert their bodies into boats, and float on the surface of the water. When one of these animals wishes to swim, it ascends the object to which it is clinging—say the glass of the aquarium—until it has reached the air. It then very slowly, and bit by bit, detaches the upper part of the base from the glass, allowing itself to hang with its tentacles downward. These, by the way, are almost wholly withdrawn when the animal is engaged in this business. By degrees the whole of the base is detached from the glass except a very tiny portion of the edge. The base is next contracted in the middle into the form of a shallow cup, and, when this is done, the last hold of the glass is released, and the animal floats away, supported by its hollowed base.

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EGG-BOAT OF THE GNAT.

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Entomologists are familiar with the following facts, and were this work addressed to them alone, a simple mention of the insect would be sufficient. But as this work is intended for the general public, it will be necessary to give a description, though a brief one, of the wonderful manner in which an insect, which we are apt to think is only too common, plays the part of a boat at its entrance to life and just before its departure from this world, not to mention its intermediate state, to which reference will be made under another heading.

The insect in question is the common GNAT (*Culex pipiens*), which makes such ravages upon those who are afflicted, like myself, with delicate skins, and can have a limb rendered useless for days by a single gnat-bite.

In this insect, the beginning and the end of life are so closely interwoven, that it is not easy to determine which has the prior claim to description, but we will begin with the egg.

With very few exceptions, such as the Earwig, which watches over its eggs and young like a hen over her nest and chickens, the insects merely deposit their eggs upon or close to the food of the future young, and leave them to their fate. The eggs of the Gnat, however, require different treatment. The young larvæ, when hatched, immediately pass into the water in which they have to live, and yet the eggs are so constituted that they need the warmth of the sun in order to hatch them. The machinery by which both these objects are attained is singularly beautiful.

The shape of the egg very much resembles that of a common ninepin, and the structure is such that it must be kept upright, so that the top shall be exposed to the air and sun, and the bottom be immersed in the water. It would be almost impossible that these conditions should be attained if the eggs were either dropped separately into the water or fixed to aquatic plants, as is the case with many creatures whose eggs are hatched solely in or on the water.

As is the case with many insects, each egg when laid is enveloped with a slight coating of a glutinous character, so that they adhere together. And, in the case of the Gnat, this material is insoluble in water, and hardens almost immediately after the egg is deposited. Taking advantage of these peculiarities, the female Gnat places herself on the edge of a floating

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leaf or similar object, so that her long and slender hind-legs rest on the water. In some mysterious way, the eggs, as they are successively produced, are passed along the hind-legs, and are arranged side by side in such a manner that they are formed into the figure of a boat, being fixed to each other by the glutinous substance which has already been mentioned.

It is a very remarkable fact, which assists in strengthening the theory on which this book is written, that the lines of the best modern life-boats are almost identical with those of the Gnat-boat, and that both possess the power of righting themselves if capsized. In all trials of a new life-boat, one of the most important is that which tests her capability of self-righting; and any one who has witnessed such experiments, and has tried to upset a Gnat-boat, cannot but be struck with the singular similitude between the boat made by the hand of man and that constructed by the legs of an insect, without even the aid of eyes.

Push the Gnat-boat under water, and it shoots to the surface like a cork, righting itself as it rises. Pour water on it, and exactly the same result occurs, so that nothing can prevent it from floating. Then, when the warm air has done its work in hatching the enclosed young, a little trap-door opens at the bottom of the egg, lets the young larvæ into the water, and away they swim.

Now we come to another phase of existence in which the Gnat forms a boat. Every one knows the little active Gnat larvæ, with their large heads and slender bodies, much like tadpoles in miniature. When they have reached their full growth, and assume the pupal form, their shape is much changed. The fore part of the body is still more enlarged, as it has to contain the wings and legs, which have so great a proportion to the body of the perfect Gnat. And, instead of floating with its head downwards, and breathing through its tail as it did when a larva, it now floats with the head uppermost, and breathes through two little tubes.

Even in its former state the creature had something almost grotesque in its aspect, the head, when magnified, looking almost as like a human face as does that of a skate. But in its pupal state it looks as if it had put on a large comical mask much too large for it, very much like those paper masks which