

evitable, total dissolution of the Society. And now that the reformers have its affairs in their own hands, it is to be hoped that it will begin a new life of efficiency, and, remembering that it owes the cause of its existence to the labours of scientific men, give its most efficient aid to those scientific researches in which it has become an important element of investigation, as well as to those of a more technical nature which have given photography so great a commercial and industrial value. And on the other hand we bespeak for it the aid and countenance of all scientific men whose researches are in any way dependent on photography, and give it, in its reformation, our best wishes for that complete success and efficiency which will make it as useful to Science as honourable to itself and its members.

NOTES FROM THE "CHALLENGER"

THE following contributions to the literature of the *Challenger* Expedition appear in the *Cape Monthly*. The first contribution consists of a few notes from Commander Maclear, written on the day of the *Challenger's* departure from Simon's Bay, and will give our readers an idea of the work still before the Expedition:—

On leaving Simon's Bay, if the weather permits, dredgings and temperature soundings will be taken on the Agulhas bank; then sail made for Marion Island. This and the Crozetts will be examined; the last may be occupied by the French as an observing station for the Transit of Venus. Then for Kerguelen Island. It is not likely that the weather will allow a regular series of soundings to be taken as hitherto, but some doubtless will be taken on the passage.

Kerguelen's, or Island of Desolation, will be a fertile field of exploration in every department of science, and as it is to be one of the stations for watching the Transit of Venus, special information will be collected for the use of the astronomers who will go there towards the close of next [this] year. The longitude of the island will be determined by chronometrical measurement from the Cape, and again to Melbourne, and with the great number of chronometers (16) that the *Challenger* has on board, the longitude should be determined very accurately.

After leaving Kerguelen, Macdonald Island will be examined, and search made for a harbour there; and then a stretch will be made to the Ice Barrier. The investigations in the neighbourhood of the ice are very important, but great care will have to be taken not to get entangled in the ice. With steam power, and the clear weather there is likely to be in February, little danger need be apprehended. If the season should be fine, some considerable time will be occupied in this region, but if not, after a short stay, sail will be made for Melbourne, which will probably be reached in the end of March. After a few days there, to obtain the rates of the chronometers, we go on to Sydney to refit and, if necessary, dock. This terminates the second stage of our voyage.

Leaving Sydney about the middle of May 1874, and carrying a line of soundings to New Zealand, we next examine the islands about the Coral Sea and Torres Straits in August 1874: New Caledonia, New Guinea, Arofura Sea, Kaepang in Timor, Java Sea, Macassar, Celebes, and reach Manilla in November. We next look up the doubtful islands of the Western Pacific; visit New Ireland, the Solomon Islands, and Pellew, and Japan will be reached in March 1875. From Japan we cross to Vancouver's, and then to Valparaiso, examining Eastern Island and Sulay group in our course. Leaving Valparaiso in the end of 1875, we go through the Straits of Magellan to Falkland Isles, Rio de Janeiro, Ascension, and England in the middle of 1876.

The other communication, of a different order, comes from a gallant Blue Jacket, who speaks for himself and

the *Challengers* and their labours somewhat irreverently thus:—

FROM JACK SKYLIGHT TO HIS OLD SHIPMATE

A Letter without much Rhyme and with a little Reason

We've crossed the Line a many times in craft both great and small,

And of them 'ere fish that's thereabouts I've caught 'em nearly all.

It aint becoss I wants to boast I says as "it is so,"

But 'cos I think that wot is wot I'm just the bloke to know.

I'll first acquaint you, topmate, with the nature of my dooty,

And show you what I've larned since last we met, my beauty.

I jined this craft last winter, got rated on her ledger

A swabber, jobber, scrubber, a sounder, and a druger.

I know, old ship, when this you see you'll say I'm flyin' hi,

But it's true as Polly-Arris is above us in the sky.

At sea we sounds—no matter, Bill, if every blessed thread

Aloft or low of canvas before the wind is spread,

In it comes! And down there goes, I've really quite forgotten

How many fathoms (half-inch), Bill, until we touches bottom.

Sometimes the timmey-noggie that holds the weights don't G

And then a fog* arises as is horrible to see.

We flies in all directions, like cats on houses sportin',

The luff cries out, the donkey shies, and makes a dreadful

snortin'—

It aint a regular ass, Bill, but one of them inventions

They puts aboard a man-of-war with various intentions,

To wit, it nicks the complement, and gives the honest Jacks

More time to study politics and read their Sunday tracks.

The donkey does the hauling in, which is no doubt a blessin',

For if it had to come by hand, oh! lord, 'twould be distressin'.

We've a many curious ratins, a lot of long shore tallies

For scientific genelmen, their servants, and their valleys.

Don't yer see these learned bosses have come to search the

ocean,

But for what, old son, 'twixt you and I, I'm blow'd if I've a

notion.

I've 'eard 'em talk of Artic drift and walleys under water,

And specs next week to find they've nab'd old Davy and his

darter.

Of course you know they've got to find the link atween the

species,

Some say as there's a coon aboard as likes it all to pieces;

I cannot tell, for well you know it aint the likes o' me

That's got a chance like swells abast the curus sight to see.

The scientific swells, old chap, are mad on mud, and great

On getting things like what we used in Chiney for our bait.

You know them squids and stuff we tried for catching them

there conger?

Well, it's the same; but then the name is many a fathom longer.

They seems to me to make a deal and show a great surprise

At things we've seen, Bill, many times, when first they meet

their eyes.

Perhaps its 'cos the thing's alive their fancies somewhat tickle,

They only having seen them home screwed up in brine or pickle.

I've told yer how we sounded, now I'll tell yer how we druge,

And if my life's a angel's I'll leave yer for to judge.

We hangs the drege at the yard-arm to a sort o' kind of buffer—

At expleration, Bill, yer no I always was a duffer—

It aint a bad doge neither; for when its pulled it streches

And gives a kind of surge when the dredge at summat ketches;

It's like a koncertina, Bill, but where the wind is squoze,

From end to end a set of stays like Inde rubber goes:

A block is tacked at bottom and through it runs the line—

Which is the werry bane of life to this old pal of thine—

I've burnt my hands, I've spiled my close, I torn my underneath,

I bark'd my shins and nik'd my back, and loosened all my

teeth—

All through that blessed line, Bill, which, trifling as it seems,

Is wuss nor all the nightmares that ever hunts in dreams.

The care that is required for to keep that line from breakin'

If your stationed near the donkey is a awful undertakin';

The thing flies thro' your fingers, and if stationed near the drum,

Its safe to nab you somehow by a finger or a thumb;

Then there's the pipe and others, Bill, that raise a shout, and

call

* Row.

Till you'd almost think they'd been and caught the devil in the trawl;
The trawl's for fancy drugin' and the work's about the same,
The only diff'rance I can see is that wot's in the name.

A scientiffick genelman, our Genius on the cruise,
Explained to us the hanimals, their habits, and their use;
I don't tumble to it much; but, Bill, he spun a yarn
About the object of the cruise which I was glad to learn.
He said 'twas for the good of man to raise him summat higher,
Since it was proved by some one that a monkey was his sire;
I don't see how it follers—but he sed from wat he found
There was fields of blazing sea weed below upon the ground;
And every little blessed thing we druge out of the sea
Was for the good of all mankind, including u and me.
He likewise said, and bid us all partikularly remark,
That at the bottom also 'twas most exceedin' dark,
Cause from twenty million fathoms once we got a curus prize
(He didn't want 'em in the dark) a fish with many eyes.
He told us that we'd all be dooks when this 'ere cruise is done;
I think he was mistaken, or he meant he would be onc.

There goes the pipe, my hearty; so I'll no more at present write
But ax you to believe yours most faithful

JACK SKYLIGHT

THE COMMON FROG*

X.

The Nervous System of the Frog.

THE nervous system consists of the brain, spinal marrow, and nerves.

The whole consists of a soft, white substance, ultimately composed of minute threads, termed *nerve-fibres*, and minute round bodies called "ganglionic corpuscles."

The brain is contained in the cavity of the skull, and consists of a rounded mass made up of corpuscles and fibres, and itself contains a cavity which is a remnant of the original canal formed by the upgrowth and overclosure of the walls of the primitive groove of the embryo.

The spinal marrow (as has been said earlier), traverses the canal formed by the successive neural arches of the vertebræ being directly continuous with the brain which it, as it were, continues on down the back. Like the brain, it is largely composed of corpuscles, as well as fibres, and itself contains a longitudinal cavity (continuous with that in the brain), which is also the ultimate condition of the canal formed from the primitive embryonic groove.

The nerves generally (which are made up of fibres) proceed forth from the brain and spinal marrow, which therefore are called the *central*, or (from their position along the dorsal axis of the body), the *axial* portion of the nervous system.

All the nerves which so proceed together constitute what is called the *peripheral*, or (because going to the limbs which are appendages of the trunk), the *appendicular* portion of the nervous system.

From the brain proceed the nerves of special sense: a pair, one on each side, going to the nostrils (1, the *olfactory nerves*), another pair going to the eyes (2, the *optic nerves*), and a third pair going to the ears within the skull (3, the *auditory nerves*). Other nerves go to the tongue and palate, ministering to taste, and again others to the little muscles (orbital muscles), which move the eyeball in various directions, and to different parts of the face.

The nerves which come forth from the spinal marrow are called spinal nerves. They proceed out in pairs (one on each side), and are distributed to the limbs and trunk.

Each nerve consists of fibres, of the sorts proceeding respectively from the ventral (in man anterior), and the dorsal (in man posterior) aspects of the spinal marrow. But these two kinds of fibres are distributed side by side in the ramifications and distributions of each nerve.

* Continued from p. 266.

The fibres which come ultimately from the dorsal aspect of the spinal marrow are those which carry inwards the effect of a stimulus applied towards their ultimate termination, and are therefore called *afferent*, or *sensory*.

The fibres which come ultimately from the ventral aspect of the spinal marrow, are those which carry an influence outwards, and produce a contraction in the muscles, and are therefore called *efferent* or *motor*.

It is the nervous system of the Frog, rather than any other set of its organs, which has especially excited interest and attention. It is especially to the relations *inter se*, of the parts of this system that inquiry has been directed. The relations, that is, of its central or axial portion (the brain and spinal column) to its peripheral or appendicular portion (the nerves of the body and limbs).

In the ever memorable year 1789, Galvani accidentally discovered in the separated legs of certain Frogs, prepared for broth, those motions produced by irritation of the exposed great nerve of the thigh, now so familiar to most. This action was long called galvanism, after this observer, not, however, that he was absolutely the first to notice a fact of which he was but a re-discoverer—Swammerdam as long ago as 1658 having observed such motions.

They are generally considered as demonstrating the purely "reflex action" of the nervous system—the responsive action, that is, upon muscles, of nervous centres acted on by external stimuli without the intervention of sensation.

It is affirmed that not only will a decapitated frog endeavour to remove an irritating instrument by means of its hind legs and feet; but that if a caustic fluid be applied to a spot easily reached by one foot, the decapitated frog will apply that foot to the spot. More than this, if that foot be cut off it will move the stump as before, seeking to reach the spot, and failing so to do, will then apply the other foot to the irritated locality.

These, and such experiments, are of course conclusive, if the common assumption be conceded that the brain is the indispensable nervous instrument of sensation.

It may be, however, that the faculty of sensation may be subserved by the spinal cord without the brain, and if so, all these much vaunted experiments are valueless as regards the proof of pure reflex action, not but that they are of extreme interest, as showing what may be done in lower animals without the intervention of any brain action whatever.

Mr. G. H. Lewes has long contended against the attribution of sensation to the brain exclusively, and Dr. Bastian has recently supported and enforced similar views.

The latter remarks in his "Beginnings of Life,"—"instead of accepting the popular view, that the brain is the organ of mind, I believe it would be nearer the truth to look upon the whole nervous system as the organ of mind."

Dr. Bastian here uses the word "mind," not as denoting a rational intellect but as a generic term equivalent to psychical activity.

It may be remarked in passing that these views of Messrs. Lewes and Bastian closely approximate, as far as they go, to that most rational belief that the soul of every creature is whole and entire in every atom of its bodily structure so long as the latter preserves its integrity and vital activity.

The brain of the frog consists of the same essential parts as does the brain of all the vertebrate animals, including man. In the form and in the proportions of those parts, however, it differs extremely from the higher animals (and above all from man) and resembles the lower forms—the brain of the frog (and of Batrachians generally) offering a much closer resemblance to that of a lizard than to that of a mammal.

The brain of man consists of the following fundamental parts:

1. A pair (one on each side) of small rounded bodies, each connected, by a long stalk, with the mass of the brain,