OUR BOOK SHELF

Familiar Wild Flowers. Figured and Described by F. E. Hulme, F.L.S., F.S.A. With Coloured Plates. Parts I.-XIII. (London: Cassell, Petter, and Galpin.)

THERE has certainly been a wonderful improvement of late years in the art of chromo-lithography as applied to botanical illustrations; and the specimens in the work before us are among the best that we have seen. The colouring, the outline drawing, and the general representation of habit, are all remarkably true to nature. The floral initial letters and tail-pieces, which are stated to be drawn "by various artists," are not so uniformly successful. Each part, published at the remarkably low price of sixpence, contains two coloured plates, more than one species being occasionally placed on a plate. The accompanying letter-press descriptions, though rather shorter than would in many cases be desirable, are written in plain and easy and not too technical language. There is no indication of the proportion of the British flora intended to be included under the designation of "familiar wild flowers;" but whenever the volume is completed, it will be a useful addition to our popular botanical literature, and well calculated to promote an accurate knowledge of the common plants of our fields and hedges.

Heroes of South African Discovery. By N. D'Anvers. (London: Marcus Ward and Co., 1878.)

The Countries of the World. By Robert Brown, M.A., Ph.D., &c. Vol. ii. (London: Cassell. No date.)

The Life of Sir Martin Frobisher. By the Rev. Frank Jones, B.A. (London: Longmans, 1878.)

THERE seems to be no end to the number of geographical works published nowadays. Mr. D'Anver's work is a companion volume to "Heroes of North African Discovery," by the same author, already noticed by us. Like its predecessor its numerous pictures and the many adventures of the "heroes" of its pages will render it attractive reading for boys, who, if they read it faithfully, will carry away with them much valuable information. The work does not pretend to anything like minute research, but so far as it goes, it is, we believe, trustworthy.

The present volume of Dr. Brown's work, which may be taken as a typical specimen of Messrs. Cassell's showy popular publications, deals mainly with the United States and Mexico. Dr. Brown has taken considerable trouble to obtain varied information concerning the different States, and his account of them is fairly full and accurate. In a work like this he cannot be blamed for repeating the oft-told story of his adventures in the west and north-west, though the style, rather than the stories, pall somewhat on one. The pictures, we believe, may be taken as on the whole what they purport to be; though it is curious to notice the uniformity of Nature under different conditions, and at widely separated places. One of the illustrations connected with Mexico is entitled a "Lagoon in the Sierra Calientes." Dr. Brown will be interested to know that an exactly similar scene is pictured as occurring on the banks of the Ucayli in South America, in "Paul Marcoy's" Travels; but as it is doubtful if "Paul Marcoy" was ever many miles from Paris, the "Scene on the Ucayli" may be as mythical as his "Travels."

Judging from the formidable list of authorities given by Mr. Jones, his life of the rough, but brave and even chivalrous old Frobisher must be the result of much research. Mr. Jones seems, however, to be entirely deficient in literary skill; his materials have been put together in the crudest manner possible. Though Frobisher added little to geographical knowledge, he deserves a place among the heroes of the North-West Passage for his three attempts to discover it. Unfortunately the object of his last two expeditions was to bring home shiploads of the "black earth" which people had been deluded into believing was rich in gold, and all Frobisher's efforts at discovery were balked. His life deserved to be written, but we cannot say that Mr. Jones has shown himself competent for the task.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

The Telephone

THE following experiments lately made as to the use of the telephone in connection with a magneto-electric machine, have given results which are somewhat interesting.

In the first instance a small medical magneto-electric machine was employed with the result (described by Mr. A. Percy Smith, NATURE, vol. xvii. p. 380), of a loud click at each rotation of the bobbins in front of the magnet. Driving the former by means of a small turbine, the clicks combined to form a loud musical note which rose and fell as the speed of rotation was increased or diminished. This note was well heard through a resistance of 32,000 units.

A magneto-electric exploder having two horseshoe magnets, four bobbins, and two rotating armatures was next employed. This gave a loud sound through 57,000 units of resistance. With a view to test the power of the machine to work through bad insulation, it was tried through about thirty yards of bare copper wire lying on wet grass. The sound was still powerful.

A break was then made in the line by cutting it across and dipping the two ends in a fountain basin filled with water. The two ends in the water were about twelve feet apart, and the sound was still perfectly audible. It was found in this experiment that it was *not* necessary to connect the magnetic exploder to earth, and that a sound feebler, but quite distinct, was obtained when *only a single wire was led from it.* The line was thus from exploder through twelve feet of water to telephone, the other binding screw being connected to a wire simply touching the wet gravel, there being therefore no return line.

Again the exploder and telephone were connected to a stretched wire belonging to a fence, at a distance apart of about fifty yards. The wire was supported by fifteen intermediate iron uprights with their ends buried in the ground. Earths were made for the telephone and exploder by means of a clasp knife and a little garden fork. A perfectly distinct sound was heard.

Lastly, one terminal of the exploder and telephone were connected by a wire, the others being joined by a length of twenty-four feet of thin string dipped into river water and subsequently drawn through a dry cloth. An audible sound was noticed.

The above experiments seem to point to two conclusions:—

1. That magneto-electric currents can be employed through exceedingly defective insulation, almost no insulation, in fact.

2. The omission of the earth connection of the exploder seems to indicate that the production of the sound is due either to a very slight leak from the exploder to earth—the machine was inclosed in a wooden box standing on a wooden table—or, not impossibly, to the rapid variation of potential in the line.

In the way above indicated it would appear to be possible to transmit the Morse code by means of magneto-electric currents under conditions which would render a battery absolutely inapplicable.

GEORGE S. CLARKE
HERBERT MCLEOD

Cooper's Hill, April 17

Poisonous Australian Lake

PERHAPS some of your readers may be interested in the following:—

This year the lakes forming the estuary of the Murray have been very low and the water unusually warm. The river is very low and the inflow to the lakes very slight and having a temperature of 74° F. Lake Alexandrina—on calm days surface

76°, depth 73°—during breezy temperature is 72°. A conferva that is indigenous and confined to the lakes has been produced in excessive quantities, so much so as to render the water unwholesome.

It is, I believe, *Nodularia spumigera*, allied to protococcus. Being very light, it floats on the water except during breezes, when it becomes diffused. Thus floating, it is wafted to the lee shores, and forming a thick scum like green oil paint, some two to six inches thick, and as thick and pasty as porridge, it is swallowed by cattle when drinking, especially such as suck their drink at the surface like horses. This acts poisonously, and rapidly causes death; symptoms—stupor and unconsciousness, falling and remaining quiet, as if asleep, unless touched, when convulsions come on, with head and neck drawn back by rigid spasm, which subsides before death. Time—sheep, from one to six or eight hours; horses, eight to twenty-four hours; dogs, four to five hours; pigs, three or four hours.

A *post mortem* was made on a sheep that had thirty ounces of fresh scum administered by the mouth: death was long coming on—about fifteen hours; examination made six hours after. Stomachs: none of the green scum left, all absorbed; dry grass food in stomachs. Abdominal cavity contained two pints of yellow serum; heart flaccid, but not pale; great effusion of serum around it. Lungs, liver, kidneys, and substance of brain healthy and normal, but the dura mater congested. Blood throughout veins and arteries and in both ventricles black and uncoagulable, neither did it become scarlet on exposure to the air. Many sheep that died, on being opened, presented the same appearances, all being without any sign of its presence in the stomachs.

This shows that the plant is rapidly absorbed into the circulation, where it must act as a ferment and cause disorganisation. The cattle will not touch the puddles where the scum has collected and gone putrid. Thus all they take is quite fresh, and the poisoning is not caused by drinking a putrescent fluid full of bacteria as at first supposed. When this scum collects on the banks and is rapidly left dry, it forms crusts of a green colour. This has gone out of the Murray mouth into the ocean and been wafted ashore, forming thick beds of green stuff from a few inches to twelve inches thick. When, however, this scum is left in wet pools and puddles it rapidly decomposes, giving off a most horrid stench like putrid urine, or archil in process of manufacture; but previous to its getting into that state it emits the smell of buytric acid, smelling like very rancid butter.

There exudes from this decomposing matter a blue pigment which has remarkable properties. Sample tube 1 contains the fluid as strained off from the scum and will be found full of bacteria. No. 2 is the same with glycerine, and filtered to separate the bacteria.

This fluid is remarkably red, fluorescent by reflected light, being blue by transmitted light. Spectrum a broad and deep band total at top in the red, but shading off to green, quite cutting off orange and yellow.

Chemical properties:—Heat destroys colour; sulphuric acid no action; nitric acid reddens; hydrochloric acid, the alkalis, and ammonia, destroy colour; chlorine and ozone bleach; light but little action, yet sunlight gradually bleaches; dries to a mass, retaining colour; soluble in water, glycerine, and weak alcohol. I think this is allied to the colouring matter of some lichens, is a product of decomposition, and not pre-existing in fresh plants. Its fluorescent powers are remarkable, and the most powerful I have ever met with. GEORGE FRANCIS

Adelaide, S. Australia, February 11

Transmission of Vocal and other Sounds by Wires

THE following are notes of some additional experiments since those recorded in my paper laid before the Physical Society of London, an abstract of which appeared in NATURE of 25th inst.

1. An ordinary iron fence railing was selected containing six lines of wires varying from $\frac{1}{16}$ to $\frac{1}{4}$ inch in thickness. These wires were passed through iron supports at every *two yards*. A disc, mouth and ear-piece, was attached to one of the wires when speaking, singing, whistling, and breathing were transmitted through distances varying from twenty to sixty yards, whilst the sound of a small tuning-fork was heard at 100 yards.

2. In an iron fence, with heavy iron top-rail, half inch square in section, and having iron supports at *every yard*, it was found that the above-mentioned sounds could be transmitted through about thirty yards; the tuning-fork sound, however, was heard at sixty-six yards.

In the latter experiment the best results were got with a hollow wooden mouth-piece, pressed against the iron, the ear being connected with the iron by means of a solid body, such as a cork.

3. Some yards of No. 16 copper wire were attached to the ordinary bell-wire connection from one room to another; another portion of the same copper wire was attached to the brass bell crank in another room—a lobby intervening;—speaking, singing, and other sounds were readily transmitted; the tone was low, but clear.

For this experiment the terminal discs were of pasteboard, set in metal rims.

In the experiments with the iron fence, the sounds were free to pass not only up and down the particular wire selected, thus necessarily *doubling* the range of distance given above, but suffered breaking up at each support, and consequent distribution through the other wires.

Glasgow, April 27 W. J. MILLAR

Westinghouse Brake

THE experiment shown by the Westinghouse Brake Company was described by Sir W. Armstrong as long ago as 1843, in a paper "On the Efficacy of Steam as a Means of Producing Electricity and on a Curious Action of a Jet of Steam upon a Ball" (*Phil. Mag.* xxii.). The explanation of the phenomenon as due to the centrifugal force of the diverted jet is given in general terms in Young's "Lectures on Natural Philosophy" (Lecture xxiv. p. 297). R.

April 28

The Oxford Commissioners' Statement

MAY I be permitted to draw attention to the very marked discrepancy between the arrangements proposed by the University of Oxford Commissioners for the Animal and for the Vegetables side of Biology? Assuming, as we fairly may, that by "Physiology" the Commissioners mean Animal Physiology, and supposing—what is by no means improbable—that the future Reader in Invertebrate Anatomy would refuse the Professorship of Zoology; when that office is next vacant, we see that there would be *four* University Professors (or Readers) of Animal to *one* of Vegetable Biology; while we may also note that at Christ Church there is a Reader in Anatomy, and that at no College is there any Reader in Botany.

When the efforts, which may fairly be described as violent, to effect the removal of the Botanical Gardens to a peculiarly objectionable site failed, it was hoped that those who, wittingly or unwittingly, endeavoured to paralyse the study of Botany in this place, would have yielded fairly.

The suggestions now made lead us to fear that the Commissioners have been persuaded to do what the University would not do.

At any rate, if the matter is too delicate for the Professor of Botany to deal with, it is to be hoped that other Botanists will make proper representations to the University Commissioners.

April 27 B.

Contact Electricity

IF a Volta's condenser be formed of an iron and a copper plate having their surfaces of contact well ground together, it is found that, on placing them together and then separating them, the iron acquires a positive charge and the copper a negative. This occurs so long as the atmosphere surrounding the plates is the ordinary one containing watery vapour and other oxygen compounds. But if the atmosphere contain sufficient hydrogen sulphide, the iron will be found negatively and the copper positively electrified. Sir Wm. Thomson has shown that "a metal bar insulated so as to be movable about an axis perpendicular to the plane of a metal ring made up half of copper and half of zinc, the two halves being soldered together, turns from the zinc towards the copper when vitreously electrified, and from the copper towards the zinc when resinously electrified."

Substituting for the zinc half of ring an iron half, the same effect takes place, but in a less degree; but if the ring be