

towards morning moderated, and brilliant flashes of lightning were seen to the eastward."

CHARLES WEST

Lloyd's, London, E.C., January 11

The Admiralty Manual on Terrestrial Magnetism

IN a recent number of NATURE you mention that the new edition of the Admiralty Manual on Terrestrial Magnetism is being edited by me. It gives me great pleasure to be able to inform those interested in this work that I have obtained the advice and assistance of Capt. Creak and Mr. Whipple as to the changes required in the description of the ship- and land-observations respectively. From the guidance of such able specialists I feel that the work will have a value that it could never have had from my unaided exertions.

GEO. FRAS. FITZGERALD

Trinity College, Dublin, January 6

Anchor Frosts

ON the night of Friday, January 8, there was an anchor frost in the Cherwell such as has not been known for twenty years, according to people who have lived at a mill on the river (Clifton Mill, near Aynho Station) for that period. In a mild form the phenomenon is fairly frequent there. The most marked effects are seen in comparatively still water.

Thus, in the mill-pond, where the current is stopped by the mill during the night, the whole stream becomes semi-viscous. Roots beneath the water, the brickwork at the sides of the mill-pond, &c., are seen to be coated with ice beneath the water as far down as can be seen, and between this ice and the surface ice-crystals form, not in a sheet or block, but interlaced loosely, like snow crystals in a drift. The mass thus formed blocks the channel, and it is said that water coming upon it from above will rise in level and flow over it, as over a solid obstruction. This I have not seen myself.

When the mill is started, at first the water will hardly flow past the wheel; but at length the crystals are forced to the surface, where they remain in floating masses, under which the water flows as usual.

The surface is not covered with a sheet of ice in these frosts.

In a broad, shallow ditch at right angles to the river, where the water is comparatively still, similar effects could be seen: the pebbles at the bottom coated with ice and the water filled with loose crystals. One consequence of the bottom ice forming on this occasion was that the floodgates were frozen down on the Friday evening, so that they could not be drawn up as usual, and the river overflowed during the night. In the morning, when they were at last raised, the water would hardly flow through, as already mentioned in the case of the water-wheel.

T. HANDS

Clifton Mill, near Aynho Station

Curious Phenomenon in Cephalonia

I BEG leave to forward to you an extract from a letter which I have recently received from a friend and former pupil who is at present an officer on board one of Her Majesty's ships in the Mediterranean. I have never seen any reference to the phenomenon which he describes. If you can insert the extract, perhaps it may evoke further information with regard to it. I would not forward the statement unless I had every confidence in the writer, so that I do not think he would be likely to be easily deceived or mistaken in his observations. He is a gentleman who took an excellent position in the Cambridge Mathematical Tripos.

E. LEDGER

Barham, January 7

"By the way, at Cephalonia there is a very remarkable phenomenon. The sea runs into the land in a strong stream, turning a water-wheel on the way, and disappears in the earth about a hundred yards from the entrance. Can you explain this? I believe no one has yet done so. No part of the island is below the level of the sea, nor is there any salt lake or spring in the island. I imagine this water must be converted into steam, which comes out either at Naples or Stromboli."

SIR F. J. O. EVANS

CAPTAIN SIR FREDERICK J. O. EVANS, R.N., K.C.B., F.R.S., late Hydrographer of the Admiralty, died at his residence, 21, Dawson Place, on December 20, 1885, in his seventy-first year.

This eminently scientific officer entered the Royal Navy in the year 1828, and served in H.M. ships *Rose* and *Winchester*, on the North American station, until 1833, when he was transferred to H.M. surveying-vessel *Thunder*, Commander Richard Owen, and was employed until 1836 in surveying operations in various parts of the West Indies.

It was in this ship, and under the guidance of her able Captain, that he imbibed those scientific tastes which formed his character later in life, and laid the foundation of a career of usefulness, uninterrupted to its close, and which has perhaps rarely found a parallel in the naval profession.

Mr. Evans subsequently served in the *Caledonia*, the flag-ship in the Mediterranean, the *Asia*, the *Rapid*, the *Rolla*, the *Dido*, and *Wolverene*, of which two latter ships he was acting master. He was confirmed in that rank in 1841, and was then appointed to H.M.S. *Fly*, Capt. F. P. Blackwood, fitting for special exploring and surveying service in Australia and New Guinea, where he was continuously employed until 1846. He took a very leading part in the examination of the Coral Sea, the Barrier Reefs of Australia, Torres Strait, and the neighbouring shores of New Guinea, regions then comparatively unknown. After a short period of surveying service on the home coasts, Evans was appointed to the *Acheron*, under the late Admiral Stokes, and was engaged until 1851 in exploring and surveying the coasts of the then young colony of New Zealand; in both these important enterprises he took a very conspicuous part, and gained for himself the reputation of a skilful and scientific surveying officer, second to none in the profession.

During the Russian war Evans was employed in the Baltic on special reconnoitring service, and was attached to various ships of the fleet, taking an active part in the operations against Bomarsund and among the Aland Isles, for which he was mentioned in gazetted despatches.

It may be truly said that for many years of his life Evans was a zealous contributor to magnetic science. He had already begun to make observations of the three magnetic elements whilst employed on hydrographic work in H.M. ships *Fly* and *Acheron* in the Australian Colonies and New Zealand, between the years 1842-1851; but it was not until 1855, when he became Superintendent of the Compass Department of the Royal Navy that he was able to devote himself entirely to the magnetism of iron ships, a subject which was then growing yearly in importance, from the increasing amount of iron used in fitting as well as construction even before iron plating had brought about an actual crisis.

Sagaciously foreseeing the important part the science of magnetism was destined to play in the Navy, then being revolutionised by the change from wood to iron, he devoted his whole energies to the study of the subject until he had made himself completely master of it.

In 1865 Capt. Evans was appointed Chief Assistant to the Hydrographer, retaining his position as head of the magnetic department; this post he continued to hold until the early part of 1874, when a vacancy occurring in the Hydrographership of the Admiralty he was selected to fill it, and continued to do so with equal ability and conscientiousness until within a little more than a year of his death.

From the time of his first appointment in 1855 as Chief of the Admiralty Compass Department until his death Capt. Evans (in happy co-operation during a great part of the time with that great mathematical genius Archibald Smith) devoted himself heart and soul to the solution of what was really a question of life and death to the British Navy, and indeed to seafaring people all over the world. The question was whether it was possible so to deal with the disturbing element of iron, then entering largely into the construction of ships of all kinds, as to prevent the time-honoured compass from becoming a useless toy, or