visible for probably forty seconds. It appeared first as if approaching from the W.S.W. about 40° or 50° above the horizon, unusually large and bright, and leaving a long train of bright spots behind. After a few seconds it seemed extinguished, but in a moment or two flashed out again still brighter, apparently passing due E., at a height of about 25° or 30°, through Eridanus, Lepus, Canis Major, and Argo, and much slower than at first. While passing under Orion two protuberances burst out, giving it the appearance of an arrowhead, or rather a bird flying, as it appeared to have a tail which at the end was a fine smoke colour: it now occupied the space of 1½° or 2°. Passing behind a cloud below Regulus it disappeared.

Waterford, March 9 JAMES BUDD

"Whin"

CAN you or any of your readers furnish a probable etymology of the word *whin?* Over all the north of England and south of Scoland basalt is so called. Here we have the *whin*-sill or stratiform basalt—*whin*-dykes, or geological fissures filled with basalt. The vocabularies in treatises on geology give no derivation of this prevalent mining term. In Scotland *whin* seems to typify the hardest mineral known. Burns makes Death say in "Hornbuik," "I micht as weel hae tried a quarry o' hard *whin* rock." Surely a satisfactory root for the word in question can be found in Celtic, Old Norse, Danish, or Anglo-Saxon! The Old Norse "fors" is found in the names of several local waterfalls, as for instance "High Force" in Teesdale. At this "force" the river Tees is precipitated over a whin-stone cliff, 80ft. high.

WM. R. BELL

Laithkirk Vicarage, Mickleton, March 12

CUCKOO AND PIPIT

SEVERAL well-known naturalists who have seen my sketch from life of the young cuckoo ejecting the young pipit (opposite p. 22 of the little versified tale of which I send a copy)* have expressed a wish that the details of my observations of the scene should be published. I therefore send you the facts, though the sketch itself seems to me to be the only important addition I have made to the admirably accurate description given by Dr. Jenner in his letter to John Hunter, which is printed in the "Philosophical Transactions" for 1788 (vol. lxxviii., pp. 225, 226), and which I have read with pleasure since putting down my own notes.

The nest which we watched last June, after finding the cuckoo's egg in it, was that of the common meadow pipit (Titlark, Mosscheeper), and had two pipit's eggs besides that of the cuckoo. It was below a heather bush, on the declivity of a low abrupt bank on a Highland hill-side in Moidart.

At one visit the pipits were found to be hatched, but not the cuckoo. At the next visit, which was after an interval of forty-eight hours, we found the young cuckoo alone in the nest, and both the young pipits lying down the bank, about ten inches from the margin of the nest, but quite lively after being warmed in the hand. They were replaced in the nest beside the cuckoo, which struggled about till it got its back under one of them, when it climbed backwards directly up the open side of the nest, and hitched the pipit from its back on to the edge. It then stood quite upright on its legs, which were straddled wide apart, with the claws firmly fixed half-way down the inside of the nest among the interlacing fibres of which the nest was woven; and, stretching its wings apart and backwards, it elbowed the pipit fairly over the margin so far that its struggles took it down the bank instead of back into the nest.

After this the cuckoo stood a minute or two, feeling back with its wings, as if to make sure that the pipit was fairly overboard, and then subsided into the bottom of the nest.

As it was getting late, and the cuckoo did not immemediately set to work on the other nestling, I replaced the ejected one, and went home. On returning next day, both nestlings were found, dead and cold, out of the nest. I replaced one of them, but the cuckoo made no effort to get under and eject it, but settled itself contentedly on the top of it. All this I find accords accurately with Jenner's description of what he saw. But what struck me most was this: The cuckoo was perfectly naked, without a vestige of a feather or even a hint of future feathers; its eyes were not yet opened, and its neck seemed too weak to support the weight of its head. The pipits had well-developed quills on the wings and back, and had bright eyes, partially open; yet they seemed quite helpless under the manipulations of the cuckoo, which looked a much less developed creature. The cuckoo's legs, however, seemed very muscular, and it appeared to feel about with its wings, which were absolutely featherless, as with hands, the "spurious wing" (unusually large in proportion) looking like a spread-out thumb. The most singular thing of all was the direct purpose with which the blind little monster made for the open side of the nest, the only part where it could throw its burthen down the bank. I think all the spectators felt the sort of horror and awe at the apparent inadequacy of the creature's intelligence to its acts that one might have felt at seeing a toothless hag raise a ghost by an incantation. It was horribly "uncanny" and "grewsome."

J. B.

The University, Glasgow

* "The Pipits," illustrated by Mrs. Hugh Blackburn (Glasgow: Maclehose, 1872).

DR. G. E. DAY

IN a former number, under the date of February 8, we had the painful duty of announcing the death, at the age of fifty-six, of Dr. George Edward Day, F.R.S., Emeritus Chandos Professor of Medicine in the University of St. Andrews, which took place at Torquay on January 31, 1872. Most of his earlier friends had probably heard of the sad accident which reduced him to a state of bodily helplessness, and which darkened his latter years; but few of those who remembered him only as the genial witty Cantab, overflowing with life and spirits, and as the brilliant medical student at Edinburgh, carrying everything before him in class-room and debating hall, or later, as the active untiring President of the Medical Examinations at St. Andrews, would have supposed him capable of the cheerful resignation with which he submitted to his enforced exclusion from all participation in active, professional, and social life.

The story of Dr. Day's life is a sad record of brilliant expectations suddenly wrecked, and long continued struggles against irreparable calamities.

As the eldest son of a wealthy country gentleman of good position, his fortune seemed assured from his birth; but the failure of the Swansea Bank in 1825, when he was scarcely ten years old, ruined his father, and led to his removal to the house of a widowed grandmother.

In 1834, after some preparation under a private tutor, he went up to Cambridge with the reputation of an able mathematician, and a good classical scholar. At the University he worked splendidly by fits and starts, but the period between 1834 and 1837 does not belong to the working era of Cambridge, and George Day's natural love of fun and the fascination of his manner combined to render his society especially attractive to his comrades, and the result was, that he came out as low as twelfth among the wranglers of his year.

On leaving Cambridge he resolved to adopt medicine as his future profession, and went to Edinburgh, where he at once took his place among that brilliant band of

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young men who reckoned John Goodsir, Edward Forbes, and many others of similar promise amongst their ranks. On leaving Edinburgh he at once came to London, and taking a house at the West End, attempted to establish himself as a pure physician. During these eight or nine years of his London life, Dr. Day laboured on with unwearying industry and patience, lecturing at the Middlesex and other metropolitan medical schools, writing for reviews, translating from German, and turning his versatile talents and his special knowledge of physiological chemistry to account in every way. The result of this heavy strain was a threatening of brain disease, which, according to the verdict of his medical advisers, could only be warded off by complete rest and cessation from the cares in which he was immersed.

At that moment the death of an old friend, Dr. John Reid, opened the prospect to him of obtaining the Chair of Medicine at St. Andrews. His success in this probably saved his life, for the removal from the turmoil of a struggling London career to the comparative ease of the Scottish University arrested the threatenings of disease, and enabled him to recover some of his old vigorous tone. During the 13 years that Dr. Day held the Chair of Medicine at St. Andrews, from 1850 to 1863, he made it his special duty to promote the honour and further the interests of the University by raising the character of medical degrees; and so successfully did he accomplish this task, that the discredit which had belonged in former days to the M.D. degree of St. Andrews was completely effaced under his presidency of the Examining Board. A new system of stringent *vivâ voce* and written examinations was then inaugurated, which justified those who graduated in his time in regarding their attainment of the M.D. degree of St. Andrews as a professional honour of which any man might be proud.

In 1857 Dr. Day's prospects of a more prosperous future than he had as yet been able to look forward to were completely destroyed by the accident to which we have already referred, and which befell him in the course of a vacation tour in the English Lake District. On a bright morning at the end of the August of that year, he had set forth from his hotel at Patterdale in full vigour and strength, bent on "learning a new wrinkle about Helvellyn," as he himself expressed it, by making his way to the summit along a recently opened path. He made the ascent as he had designed, but instead of returning by the same track, he struck off in the direction of the white lead mines; and while walking along what he mistook for a miner's path, the ground gave way under him, and he fell into what proved to be a horizontal chimney or culvert, constructed to carry off the sulphurous, arsenical, and other gases, whose deposits had proved injurious to the sheep grazing on the hill side. He was rescued after three hours of anxious suspense, but the proximate results of that accident were dislocation of the right elbow and two fractures of the same arm, the upper one in the surgical neck of the bone of the humerus, which never united. The subsequent effects were the complete destruction of his general health, which obliged him in 1863 to give up the Chair of Medicine at St. Andrews and retire from active life. A removal to the milder climate of Torquay had little effect in arresting the train of symptoms which year by year marked the progress of disease, and were, it is conjectured, the result of a jar to the spine sustained by his accident on Helvellyn, which had, in truth, proved to him the beginning of the end.

And such was the checkered career of this man of brilliant promise, unflinching bravery of spirit, clear judgment, and tender heart. Disappointed again and again, he always met his troubles manfully, and turned them to good account for himself or others. We have given no list of the various honours which he attained in his profession, or of his literary works, for the detailed reports of these particulars are contained in the various obituary notices which have appeared of Dr. Day in the medical and other journals, to whose pages, as well as to our own, he was a frequent contributor.

OCEAN CURRENTS

A NEW interest seems now to be taken in Ocean Currents, and much is being said and written upon the subject. In the investigation of this subject it is very important that we should understand well all the forces and agencies concerned in the production and maintenance of the currents, and that we should consider well all the principles, and theories based upon hypothetical forces, which have come down to us from preceding generations, however plausible and however much sanctioned by high authority they appear to be. As in the case of the winds, so also in ocean currents, the modifying force arising from the earth's rotation has a very important bearing, and should be well understood. There are certain erroneous views in connection with this force, which have come down to us from preceding generations, and which are contained in text-books, and are being taught in colleges and schools, which are liable to have, and do have, a mischievous bearing upon this subject. These are the more dangerous because they appear to have received at least the tacit sanction of past ages, so that almost any one is liable to adopt them without much consideration. Prof. Colding has in this way been unsuspectingly let into error in his recent paper on ocean currents. We are all familiar with the usual explanation of the trade-winds contained in text-books, which assuming that a particle of air at the equator, at rest relatively to the earth, and consequently having a lineal velocity in space of about 1,000 miles per hour, is forced to move toward the pole, it will, on arriving at the parallel of latitude where the earth's surface has a velocity of only 900 miles, still have its velocity of 1,000 miles per hour in the case of no friction, and consequently have a relative velocity of 100 miles per hour, and on arriving at the parallel of 60°, will still have its initial velocity of 1,000 miles, and consequently have a relative velocity of 500 miles per hour. But this is at variance with a fundamental and well-established principle in mechanics. The force in this case is a central force, or at least the compound perpendicular to the earth's axis can be neglected, since it can have nothing to do with any east or west motion. This being the case, the principle of the preservation of areas must be satisfied, and consequently the particle of air, when it arrives at the parallel where the earth's surface has a velocity of 900 miles, must have a velocity of more than 1,000 miles, and a relative velocity of more than 200 miles per hour, and on arriving at the parallel of 60°, where the earth's surface has a velocity of 500 miles, it must have a velocity of 2,000 miles, and consequently a relative velocity of 1,500 miles, instead of 500 miles per hour. Adopting thoughtlessly, and very naturally, the erroneous principle which is usually taught, that a particle of air or of water in moving toward or from the pole, tends to keep its initial lineal velocity relative to space, Prof. Colding estimates the amount of deflecting force due to the earth's rotation, eastward when the particle is moving towards the pole, and westward when moving from the pole, and the result is, that his force is just one half of what it really is. Consequently, all the results based upon his estimated amount of this force should be doubled. Prof. Colding has also entirely neglected one component of the force due to the earth's rotation. It has been shown by Prof. Everett, and also by the writer, that when a body moves east or west, there is also a similar deflecting force due to the earth's rotation, exactly equal to the former. Prof. Colding has, therefore, taken into account only the one-fourth part of the whole force. If he had taken in this latter component of the force also, and resolved it in the direction of the line of motion and perpen-

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