said to have been pierced three times by a vertical shaft. Yet the coals are not anthracite. The Vobster pits are very fiery. The Radstock pits, where the coal is horizontal, not so; but they are worked in higher beds.

By reference to the Commissioner's report to Parliament, 1871, it will be seen (p. 38) in Mr. Prestwich's report on the Nettlebridge Valley coals, where Vobster is situated, that my recollections are confirmed; "bituminous coal" and "disturbed condition" being alike attributed to these coal beds.

With respect to the general question of the mechanical theory of earth-heat, I would respectfully refer Mr. Lesley to my examination of the theory in the *Philosophical Magazine* for October, 1875. O. FISHER

Harlton, Cambridge

On the Origin of Certain Granitoid Rocks

IN a paper by me "On the Pre-Cambrian Rocks of Shropshire," read before the Geological Society on the 11th inst., I call attention to certain granitoid and gneissic rocks in Primrose Hill, at the south-west end of the Wrekin. Associated with these metamorphic strata in such an irregular manner as to suggest an eruptive origin is a compact felspathic rock with minute quartz grains, which I at first presumed to be a quartz felsite. On submitting specimens to Prof. Bonney, F.R.S., for microscopic examination, he declared the rock to be clastic, and closely allied to the hälleflintas, which Dr. Hicks assigns to his Arvonian group. Certain observations recently made in south-west Shropshire, suggested to me a transition between the hälleflinta and the granitoid types, and, on communicating my suspicions to Prof. Bonney, he stated that a similar connection had been suggested by his microscopic examination. This morning I hammered over Primrose Hill foot by foot, and I have the satisfaction of announcing the fullest confirmation of our suspicions. In the same block, the compact hälleflinta is frequently mixed up with granitoidite and hornblendic gneiss. In some cases, the metamorphism has taken place only near the surface, as if produced by atmospheric agencies; in others the crystallisation occurs in nests, while in others there is a gradual transition in mass from a compact to a granitic structure. This passage of hälleflinta into granite has obviously important theoretical applications.

Wellington, Salop, June 21 C. CALLAWAY

Migrations of Birds

I NOTICED some time ago a communication in NATURE respecting this subject, stating that it would be instructive and interesting alike if naturalists would record any data they may have collected on this subject. For years now this matter has had my careful attention, and I therefore forward a few notes for the last two seasons, and also put forward the hope that observers stationed in other parts of the United Kingdom will contribute information of a like nature. I would also say that the weather noted applies to the night—the time, by the way, generally chosen for migratory movements.

Vernal Migration, 1878

Dates.	Species.	Remarks.
April 4	Gray Wagtail	In pairs on the trout streams for nesting season. Weather clear, warm westerly breezes.
,, 4	Tree Pipit	In full song and seen for first time; westerly breezes.
,, 15	Redstart	In full song in Encliffe Wood and Rivelin Valley; warm westerly breezes, clear.
,, 15	Willow Warbler	Numerous, arrived during last night.
,, 15	Ring Ousel	Numerous and full of song.
,, 18	Chiffchaff	In small numbers, westerly breezes, very warm, close.
,, 19	Swallow	One specimen seen; westerly breezes, fine and clear.
,, 19	Cuckoo	Heard and saw flying over the busiest streets of Sheffield at 4.30 A.M.
,, 22	Whitethroat	One heard; dull and misty drizzling rain, W.S.W.
,, 22	Martin and Sand Martin	Numerous, in company with swallows in the Derwent Valley.
,, 28	Blackcap Warbler	First seen, but silent; warm breezes, S.E.S.
,, 29	Whinchat	Seen for first time, weather dull, S.E.S.
,, 29	Common Sandpiper	Seen for first time, in pairs, in Rivelin Valley.
May 3	Landrail	First heard, weather dull and gloomy, W.
,, 6	Spotted Flycatcher	First seen, very wet night, wind direct, S. These birds are still solitary.

Vernal Migration, 1879

Dates.	Species.	Remarks.
Feb. 10	Song Thrush	Arrived in night; dark and cloudy, wind W.
,, 10	Blackbird	Arrived in night; dark and cloudy, wind W.
March 20	Yellow Wagtail	Numerous.
,, 20	Pied Wagtail	,,
,, 29	Willow Warbler	One specimen seen, somewhat feeble, silent; wind W. by S., night dull and showery, snow only left ground day before. Never known this species so early before. Average time being April 5.
,, 29	Greenfinch	Again in usual haunts after being entirely absent during the winter, with the exception of one pair seen in a garden in Sheffield.
April 9	Chiffchaff	Saw and heard in young fir plantations at Hollow Meadows, S.W. and westerly winds.
,, 21	Curlew	In pairs at breeding grounds on moors.
,, 21	Ring Ousel	Numerous on moors, mostly in pairs; no song.
,, 24	Tree Pipit	Arrived; dull and showery weather, easterly winds.
,, 26	Willow Warblers and Chiffchaffs	On the evening of 25th not a bird was seen; on morning of 26th the birds abounded and their cheery notes are heard on every side. The night was dark and showery (new moon), wind S.
,, 26	Cuckoo	Heard in Lees-hall Wood. This bird has arrived during past night, doubtless in same flight as willow warblers, &c.
,, 28	Swallow	Seen in Meersbrook Park; weather showery and dull, wind light from S.W., moonlight.
,, 29	Whinchat	Seen in Meersbrook Park; weather showery and dull, wind light from S.E., moonlight.
May 2	Wheatear	On moors, full of song.
,, 2	Common Sandpiper	Rivelin and Redmires dams, in pairs. This species has been here some few days.
,, 2	Redstart	This bird has now arrived, but only seen in small numbers. Cold easterly winds, moonlight.
,, 5	Wryneck	Saw on Rivelin moors; solitary and uttering its whistling notes. Cold easterly winds.
,, 8	Landrail and White-throat	Heard in meadows; very scarce; probably came last night with a cold south-westerly breeze.
,, 12	Sand Martin	Skimming over the waters in small numbers. This species is remarkably late; wind N.W. by W.
,, 13	Blackcap	Singing in densest covers, and very shy. This species is very late. South-westerly breeze, clear night.
,, 17	Martin	Saw a pair of these birds; they are very late as compared with previous seasons. Southerly breezes and very showery.
,, 24	Swift	One seen on the borders of the Rivelin Moors. South-westerly breezes and very showery.
,, 26	Spotted Flycatcher	One specimen seen, silent and somewhat wary. N.W. by W., light, and showery moonlight night.

Such are a few extracts, taken *verbatim*, from my note-book; they might have been considerably increased, and the time of departure noted, as well as the arrival of our winter migrants, but I fear I have already trespassed too greatly on your valuable space. I sincerely trust that this interesting subject will be more fully discussed and studied by your correspondents and readers; for in that way many of the difficulties enshrouding the movements of the feathered tribes will be overcome.

Heeley, near Sheffield, June 9 CHARLES DIXON

Glow-worms *v.* Snails

YOUR correspondent, Mr. R. S. Newall, has unconsciously reversed the natural condition of affairs in his note (NATURE, vol. xx. p. 197). The heading should have been as above. Glow-worms *devour* snails, which are their natural food. The particular snail in question had probably been attacked by one of the glow-worms, which had left some of its phosphorescent matter adhering to it, and this occasioned the idea that it was showing through the body of the mollusk. Possibly in this case the snail may have proved too large for the glow-worm. An allied insect, *Drilus flavescens*, somewhat rare in this country, and not luminous, is, so far as the female is concerned, seldom