the skull and horn-cores of *Bison priscus* in 1867. It will be observed that the upper layers of the Drift are totally distinct in character from this, being such as might be attributed to the rapid action of a series of floods sufficiently violent to silt up the Post-pliocene river-bed. The component materials are almost exclusively derived from the adjoining Green Sandstone formation; the only exception being that the Blue clay mentioned as occupying a middle position appears to be the surrounding Kimmeridge clay altered by water action. The deposit is on the side of Hawkers' Hill, towards the far higher elevation of Green Sandstone and Gault on which Shaftesbury stands. The portion hitherto dug out is nearly 200 feet long, consisting, at its commencement on the hill side, of the old river bed, but slightly marked at first, with perhaps one foot of the loose sandy strata above it. Partly by the rise of the hill and partly by a slight dip of the river-bed in the contrary direction, the final thickness is increased to about 10 feet. The width excavated is only some 12 feet. We are here evidently at one margin of the Post-pliocene river, the Drift coming to an end against an abrupt bank of undisturbed Kimmeridge clay 10 feet high (see Section 3).

The surface of the hill is perfectly uniform, looking as exclusively *Kimmeridgian* as the seven or eight miles of that formation which stretch from it westward across the low lands. It will be understood that Shaftesbury hill is a high eminence composed of Upper Green Sandstone resting on Gault, and is separated from Hawker's Hill by a valley of gentle declivity. The Gault crops out some 500 yards from the Drift, and is succeeded on the steep hillside by Green Sandstone, like that from which the materials for the latter were derived. As regards the general configuration of the country, it seems hopeless to conjecture how the river could ever have flowed where its indelible traces still remain. Under present circumstances, it would be a physical impossibility. Nor is there any existing river in any direction for some miles. It should be added that most anxious search was made for any shells that might aid in determining the climate probably prevailing when the Drift was deposited, but the only acquisition was one battered and flattened snail shell—either *Helix arbustorum* or *nemoralis*. No flint implements or human relics of any kind have been found in this deposit.

The writer is indebted to Dr. Blackmore, of Salisbury, for his kindness in making a careful examination of the remains discovered, and is permitted to quote his valuable authority for the correctness of the names assigned them. It is Dr. B.'s opinion that there are indications of at least three individuals of *Bison priscus*.

The writer will be happy to answer to the best of his ability any communications that may be addressed to him on this subject.

GILLINGHAM, DORSET.

V.—THE DISCOVERY OF DIAMONDS AT THE CAPE OF GOOD HOPE.

By W. GUYBON ATHERSTONE, M.D., F.G.S., of Graham's Town, Cape of Good Hope.

IN the GEOLOGICAL MAGAZINE of December, 1868, appears an article on this subject by Mr. J. R. Gregory, declaring the whole story

of the Cape diamond discovery to be "false," "an imposture," "a bubble scheme," got up to promote the expenditure of capital in searching for this precious substance in the colony; and stating that, from the geological character of the district which he had lately very carefully and thoroughly examined, it was *impossible* that diamonds had been or could ever be found there.

As it was mainly through me that this accidental discovery was brought to light, and as I am therefore by implication accused of being one of the impostors in this fraudulent "bubble scheme," I trust I shall be allowed to make a few remarks in refutation of so extraordinary and unfounded a charge.

To enable your readers to judge of the truth and correctness of Mr. Gregory's statements and conclusions, I will give a brief history of the diamond discovery so far as I am concerned; and I forward to Professor Tennant, of King's College, by this mail, the first three original letters received by me, which may be examined by Mr. Gregory, Mr. Emmanuel, or any other person interested in this matter. In March, 1867, I received through the Post-office from Colesberg, a letter from Mr. Lorenzo Boyes, Clerk of the Peace for that district, of which the following is a verbatim copy:—

COLESBERG, March 12, 1867.

MY DEAR SIR,—I enclose a stone which has been handed to me by Mr. John O'Reilly as having been picked up on a farm in the Hope Town district, and as he thinks it is of some value I send the same to you to examine, which you must please return to me.—Yours very sincerely,

L. BOYES.

In the envelope with this note was diamond No. 1 quite loose, the letter not *registered* nor sealed, simply fastened by gum as usual. I had never seen a rough diamond before, but upon taking its sp. gr. and hardness, examining it by polarized light, etc., I at once decided that it was indeed a genuine diamond of considerable value; and perceiving the great importance of such a discovery to the colony, I at once wrote to the Hon. Richard Southey, Colonial Secretary, announcing the fact, and suggesting that it should be sent to the Paris Exhibition, and afterwards sold for the benefit of the finder. On receipt of my letter in Cape Town, the Colonial Secretary at once telegraphed to me to send it up to Cape Town and he would send it to the Crown agents for transmission to the Paris Exhibition. I gave it to Sir Percy Douglas, our Lieutenant-Governor, who kindly had it conveyed by the next steamer to Cape Town, where it was examined by the French Consul, M. Herriette, and other competent judges, who confirmed my opinion; it was afterwards sent to the Paris Exhibition, and purchased by the Governor of the Colony, Sir Philip Woodhouse, for £500.

Now if there be any fraud or imposture with the Cape diamonds, it must be with the discovery of this, the first and most valuable diamond, and I will therefore go rather more minutely into particulars as to the parties connected with it. It was by mere accident that a Dutch farmer named Schalk van Niekerk, seeing some children of a Mr. Jacob, another Boer, playing with some bright stones, noticed this one in particular, and asked the mother to sell it to him,

She laughed at the idea, and gave it to him at once. Mr. John O'Reilly (son of the late Civil Commissioner of Somerset, and grandson to Colonel O'Reilly, now in Graham's Town,) happened to be returning from a hunting and trading expedition in the interior, and Mr. Niekerk asked him to find out what sort of a stone it was. Mr. O'Reilly took it to Colesberg and showed it to his friend Mr. L. Boyes, the Clerk of the Peace (son of Captain Boyes, an officer in H.M. service), who sent it to me. The parties concerned, therefore, were—a farmer's child, a Dutch Boer, Mr. O'Reilly, Mr. L. Boyes, a Government official, myself, and Sir Philip Woodhouse, Governor of the colony, who purchased it. Which of these parties is the fraudulent impostor, getting up a land-jobbing speculation? since this is one of the reasons assigned for the supposed planting of diamonds in the colony. Mr. Gregory's theory regarding the expenditure of capital in search for diamonds, carries its own contradiction with it. None of them own land in that part of the country except Mr. Niekerk and Mr. O'Reilly, and the gem was not found on Mr. O'Reilly's or Mr. Niekerk's farm, nor were either of their farms for sale at the time. Is it reasonable to suppose that if either Mr. Niekerk, or Mr. O'Reilly, or Mr. Boyes, had imagined it to be a gem of the value of £500, it would have been trusted to the letter-bag through the Post-office? The idea is simply *absurd*; and the fact that twenty other diamonds have been discovered since, at spots far apart, on Government ground, in the territories of native chiefs, along the Orange River, Vaal River, and Reit River, and far beyond the colony, where there is no land to sell,—and found by all kinds of persons, Englishmen, Boers, Griquas, Bechuannas, Hottentots, and other natives, who can have no possible connection with land speculation, proves the utter absurdity and impossibility of those statements.

Of the diamonds already found, six were discovered along the Orange River, in the Hopetown division; six along the Vaal River, three beyond the Vaal River, two beyond the Orange River, two along the Reit River, and one in Waterboer's country, and one on Government land in the colony. Again, who have been the purchasers? Five have been sold to the Governor; two to Mr. Hond, the lapidary; three to Mr. Lilienfeld; one to Mr. Chapman, of Cape Town; one to Mr. M. Joseph, of Cape Town; one to Mr. Cruikshank, to send to Scotland,—*none of these* in any way connected with land speculations.

It is a fact that there have been no land speculations or sales in that neighbourhood since the diamond discovery was made known. I think this mass of evidence must quite overthrow Messrs. Gregory and Emmanuel's theory that diamonds were placed there *for a purpose*, and satisfy every unprejudiced person that the discovery is a *bonâ fide* discovery, and one of immense importance to the colony.

Now as to Mr. Gregory's geological facts. He states, "The whole of the district from Cradock, almost in a direct line to Hopetown, upwards of 250 miles, is composed of igneous or volcanic rocks; the huge piles of rounded boulders are Trap porphyries, and the Trap

dykes in many places have forced them up, and the sands both of a white and red colour, are simply the *debris* from the breaking up and wearing away of their burnt porphyries and burnt clays or Porcellanite, which were formed originally through the volcanic heat vitrifying these silicious clays. No other geological deposits are visible, nothing but igneous and volcanic rocks, and the sands mainly produced by their decomposition, and associated with these sands and in the beds of the Orange and Vaal rivers are the characteristic Trap minerals only—such as Zeolites, Natrolite, and sometimes Stilbite, with small agates and geodes of chalcedony; from the interior of which geodes, but of larger dimensions, are derived the brilliant rock crystals, of which thousands may be found, most of them rounded on the edges, though some are perfectly uninjured, as the usual hexagonal prism, sometimes with both terminal pyramids." Now I am fortunately able personally to contradict this statement *in toto*, for although I have not visited the Hopetown District, I have examined the Cradock district, and the country between it and Colesberg, and I have myself collected beautifully perfect reptilian and other *fossils* from the very parts which Mr. Gregory declares to be nothing but igneous and volcanic. "No other geological deposits are visible," he states! Dr. Gray, of Cradock, has sent home numbers of *Dicynodon* and other fossils from this very district; so have I and Mr. Bain, Mr. Stowe, and others. If this is a specimen of Mr. Gregory's careful and lengthened examination of the Cradock division, we know what value to attach to his report and examination of the Hopetown and diamond-yielding district!

Mr. A. Wyley, the colonial geologist, gave ten years ago, and before diamonds were thought of as existing there, a careful geological description of the Hopetown district, which Mr. Gregory may consult with advantage. He will find a copy of this report in the Geological Society's Library, which I sent through Professor Rupert Jones. It is entitled "Notes of a Journey in two directions across the colony made in 1857-8," by A. Wyley, Esq., Geological Surveyor to the colony, 1859. He describes the country as consisting of *Sandstones*, *Shales*, and *Schists*, intersected by basaltic trap-dykes, etc.; in fact very similar to the great basaltic plateaus and horizontal Sandstone formations in India, where the most celebrated diamond formations occur, and to which I think it will be found our diamond-bearing formations bear a strong resemblance. Mr. Gregory, in describing the conglomerate in which the Hopetown diamonds are found, insists on what he terms "an *important* distinction," as being not a silicious conglomerate, as those from Brazil, but as being sometimes formed into a solid conglomerate by the aid of lime. But why should our diamond conglomerates be necessarily like those of Brazil? Why not rather like those of India, to which, as I have stated, our rock formations, our vast horizontal sandstones, capped and permeated by basalt, and in many cases our fossils also, bear so striking a resemblance. In Malcolmson's paper on "The Great Basaltic District of India, and the Diamond Sandstones and Argillaceous Limestones," published in the Geological Transactions, 2nd series, vol. v., he says,

describing the celebrated diamond mines of Banquapilly, page 541, "the plains at the base of the table-land of Banquapilly consist of a rich black alluvium, containing fragments of basalt, jasper, and various minerals found in the hills, the rocks are a fine, compact, dark blue or marly black *limestone*, which contains much argillaceous and silicious matter."—"On ascending the hill, the limestone becomes more schistose, and is of a paler colour," etc. "Above Banquapilly it contains the diamond-breccia described by Voysey," etc., etc. Now, if Mr. Gregory will carefully read Dr. John Shaw's account of the site of the diamonds and the conglomerate bed in which they are found, published in the *Graham's Town Journal* of Jan. 20, 1869, he will find it exactly resembles the diamond-breccia and conglomerate found in India.

From the great distance of the finding places apart, and their propinquity to the several river beds, which all proceed from the Quathlamba or "Draken's berg" sandstone ranges, I have little doubt that, on careful exploration, the real source of the diamond deposits will be found far to the eastward. Sufficient has been already discovered to justify a thorough and extensive geological research into this most interesting country; and I think, for the interest of science and the benefit of this colony, a scientific examination of the country will be undertaken. So far from the geological character of the country making it *impossible*, I maintain that it renders it probable that *very* extensive and rich diamond deposits will be discovered on proper investigation. This, I trust, the Home Government will authorize, as our colonial exchequer is too poor to admit of it. Mr. Gregory in his paper (see *GEOL. MAG.*, No. 54, p. 559) honestly states his pre-conceived ideas of the falsity of the diamond discovery: "I had an idea of this" (i.e. that the whole story was false) "when I first reached George Town, then at Port Elizabeth, Graham's Town, Cradock, Colesberg, and finally on arriving at Hopetown, where no further proof of diamonds could be obtained." And I fear we may add to this list of places—where he held these views, *London* also!

Mr. Gregory called upon me, hearing that I had the Pniel diamond (No. 7 of Mr. Chalmers' list, which appeared in the *Journal of the Society of Arts*, Feb. 13th, 1869); but, unfortunately, he did not call until after the post had left, although he arrived in Graham's Town before, and I had already sent it off to the Colonial Secretary. However, I showed him a photograph and plaster cast which I had taken of it, *from which* he at once pronounced an opinion as to its *quality*, declaring it to be a "boart" diamond of very little value!! In his paper referred to, he says "This stone (No. 7) was stated to have been picked up by a Griqua on the banks of the Vaal River, near Pniel. I afterwards found this was not true, and it was said to be really found near Campbell, 100 miles from Pniel, and by a Griqua who has since found two or three others. So the locality at Pniel is a myth." Now here Mr. Gregory is evidently confusing two different diamonds: see Nos. 7 and 8 in Mr. Chalmers' list. The missionary, Mr. Radeloff, was my authority for saying it was found near Pniel, and Mr. Chalmers I see corroborates this state-

ment. Mr. Gregory told me his object was not to search for diamonds, but for nickel and other minerals usually found associated with them, and that he intended visiting the Namaqua land mines before he returned. His motives and objects, and those of his friend the diamond merchant, Mr. Emmanuel, are now but too apparent. Why all this attempt at mystification, unless he had a purpose to serve?

VI.—NOTES ON THE GREEN SLATES AND PORPHYRIES OF THE NEIGHBOURHOOD OF INGLETON.

By HENRY ALLEYNE NICHOLSON, D.Sc., M.B., F.G.S.

THE occurrence of certain of the Lower Silurian Rocks of the Lake-district beneath the Scar Limestone of Yorkshire, on a line between Ingleton and Settle, has been long known, and has been noticed both by Professor Phillips (*Trans. Geol. Soc.* 2nd series, vol. iii. p. 1), and by Professor Sedgwick (*Quart. Journ. Geol. Soc.* vol. viii. p. 35). More recently the rocks in question have been shortly described in a paper by Mr. Hughes, of the Geological Survey (*Geol. Mag.* Vol. IV. p. 346). Having had the opportunity of visiting Ingleton in company with Professor Harkness, and subsequently alone, I have collected the following brief notes of the Silurian strata which are seen in that locality, and which belong to the Green Slates and Porphyries of the Lake-district.

The section which I propose to describe is the one afforded by the Dale Beck, which runs to the north-west of Ingleborough from Chapel-le-Dale to Ingleton, and is in length between one and a half and two miles. In the course of this stream the Silurian Rocks have been exposed by denudation, and are seen, in a remarkably clear section, to be unconformably overlaid on both sides of the valley by nearly horizontal beds of Scar Limestone. The section appears to be an ascending one down the valley, and the following is the sequence of the beds exhibited.

I. The highest beds exposed in the valley are a series of ordinary, cleaved, felspathic ashes, or Green Slates, with some intercalated trappean beds, the whole striking N.W. and S.E., and having a nearly vertical cleavage.

II. These slates are succeeded to the S.W. by a fine-grained, greenish-gray felspathic trap, in parts slightly hornblendic and micaceous. This trap is continued nearly as far as Dale-barn, forming opposite this point a series of well-marked glaciated bosses. Here it has intercalated in it a band of slates about 30 feet in thickness, and it assumes a slaty texture in parts. Above this slate-band the trap in places becomes highly porphyritic, consisting of a green felspathic base, containing numerous crystals of red felspar, with masses of crystalline quartz, specks of hornblende, and flakes of mica. Its composition, however, is very variable, and it passes directly into fine-grained trap on both sides. Blocks apparently of this porphyritic trap are found nearly a mile and a half down the stream; but these are much more highly quartzose in composition,