

attached in my paper to any case not fully corroborated, and out of scores of such cases received some half-dozen have been published, as is expressly stated in my paper, in order to elicit further information on account of their intrinsic interest.

As regards the liability to overlook failures, I have referred to this point both at the outset of my paper (p. 4) and elsewhere; further (on pp. 238 and 239), I state: "It must be borne in mind that (especially among amateur dowisers) one is more likely to hear of success than failure, and therefore an extensive and searching inquiry is necessary before any safe induction can be drawn. . . . All that was possible in the present investigation was to make the range of evidence as wide and unbiassed as possible, and not exclude a single case of failure that was substantiated. This has been done." It is, of course, easy to select, as your reviewer does, a certain number of cases in which the failures exceed the successes.<sup>1</sup> But I think one is more likely to arrive at a correct estimate by the method I adopted, which was to make extensive inquiries, both generally and specifically, with regard to failures as well as successes in the case of every professional dowser I heard of. This is naturally a vastly more laborious method than your reviewer's, but was necessary in order to arrive at the actual facts in a subject which from all sides has been loosely discussed, albeit by eminent men, for upwards of 200 years.

I am glad to find your reviewer endorses certain cautions I suggested in the event of further investigation; though what he means by "thought-reading" as a source of error is not quite clear. It is a matter of importance, more so than your reviewer appears to imagine, to recognise, and if possible exclude, the aid which the dowser derives from indications given by the surface of the ground. Long practice may give the most illiterate person a power of detecting surface indications of underground water, or the faint tremor of unseen running water, that would entirely escape the ordinary observer, and of enabling correct inferences to be drawn even from indications that the dowser may have noticed quite unconsciously. We have here, doubtless, the explanation of some of the singular successes of dowisers in finding water; but a careful examination of the evidence I have collected has led me to think that no explanation hitherto suggested is adequate to account for all the facts.<sup>2</sup>

Kingstown, Co. Dublin, October 21. W. F. BARRETT.

AT the head of Prof. Barrett's memoir is the following quotation from Mr. Andrew Lang: "There are two ways of investigating the facts or fancies about the divining rod. One is to examine it in its actual operation—a task of considerable labour, which will doubtless be undertaken by the Society for Psychical Research; the other, and easier way, is to study the appearances of the divining wand in history." This naturally led me to think that Prof. Barrett intended to treat the subject as, in the main, a matter for personal investigation. He now claims, however, "to take the place of a judge in a court of inquiry." I therefore withdraw the term "hearsay" applied to the bulk of the evidence he has so laboriously collected, and will accept his own view of his position.

But Prof. Barrett will agree with me that this is a technical investigation needing expert knowledge. Now if so, where does the necessity for expert knowledge come in? Surely not after the experiments have all been made, and the dowser is off the scene; but, as in any other scientific investigation, on the spot, with the man and the conditions all before you. This is the very core of the investigation, and no amount of after analysis can atone for the lack of *personal* observation and judgment exercised at this, the crucial point. But here, where expert knowledge and observation are essential, he relies on others, of whom the majority have no previous knowledge or scientific training whatever.

Prof. Barrett "had to exclude all evidence but that of *eye-witnesses*." As to his "152 numbered cases,"<sup>9</sup> are avowedly supplied by people who, on their own statement, do *not* appear to be eye-witnesses. In 41 more there is nothing to show whether

<sup>1</sup> The reviewer is, however, delightfully free from the pedantry of those who think accuracy desirable when dealing with such a contemptible superstition as the so-called divining-rod. This, I think, is apparent already; it becomes more so when specific assertions of his are examined, such *e.g.* as "only two successes are mentioned in the Isle of Wight," &c.

<sup>2</sup> That a mixture of crass ignorance and charlatanism is to be found in many professional dowisers, and that some of them are little better than rogues, is only what might be expected; but, on the other hand, we have the fact that so distinguished a *savant* as M. Mortillet was once, as he tells us himself, a professional dowser, and published a book on water-finding in 1849. The President of the Royal Geological Society of Cornwall is still a successful amateur dowser.

his informant met the dowser himself, or is trusting to information received from others. The information in 8 of these comes from a firm or joint-stock company; 8 are merely newspaper reports; some are ancient cases, which cannot now be inquired into.

With reference to the statement regarding liability to overlook failures, I did not state or wish to imply that Prof. Barrett had not fairly given all the failures which came to his knowledge. What I did wish to imply was, that his method of writing to the parties concerned for evidence on this point was not likely to yield much result.

As to the Isle of Wight, I may say, that not making it a habit to collect information regarding the employment of dowisers in different districts, I merely alluded to one where I happened to have stumbled upon facts bearing on the question. Whether or no other districts would give similar or contrary results I cannot say, having no material to go upon.

I fail to understand what meaning Prof. Barrett attaches to the term "surface indications." He agrees with me as to their great importance; yet there are only 32 cases in which his informants make even the slightest reference to this subject, and in only 8 is there any note that Prof. Barrett made special inquiries on this all-important point.

As previously stated, my criticisms apply to the bulk of the evidence. I thoroughly recognise the value of Prof. Barrett's personal observations, and have only to regret that these experiments form so very small a part of his memoir.

THE WRITER OF THE ARTICLE.

#### A Proposed Memorial to Prof. Victor Meyer.

THERE appears to be a strong desire among many of the British students who worked under the late Prof. Victor Meyer, to give expression to the feelings of gratitude and admiration with which they remember him, by raising some form of memorial to be placed in the Heidelberg Lecture Theatre.

It has therefore been decided to call a general meeting of Prof. Meyer's British students, to be held in Manchester on Saturday, December 11, at 5 p.m. Prof. H. B. Dixon, F.R.S., has kindly placed the Organic Lecture Theatre of Owens College at our disposal.

All past students of the late Victor Meyer, whether they worked with him in Zürich, Göttingen or Heidelberg, are earnestly requested to be present.

I shall be pleased to receive suggestions from any who may be unable to attend, in order that they may be laid before the meeting.

J. J. SUDBOROUGH.  
University College, Nottingham, November 23

#### The Critical Temperature of Water.

CAN any of your readers tell me what is the critical temperature of water. I find in the supplement to Jamin and Bouty's "Cours de Physique" the critical temperature given as 370° C. and the corresponding pressure as 195.5 atmospheres. On the other hand, Cagniard-Latour gave this temperature as equal to the melting point of zinc, which is known to be about 415° C.

I have some theoretical grounds for believing this latter figure to be the more accurate, so should be glad to know what other determinations, if any, have been made.

H. M. MARTIN.  
39 Guildford Street, W.C., November 19.

#### Coccoliths in our Coastal Waters

IN our communication to NATURE, September 16, 1897, we say "the presence of these bodies (coccoliths) in our coastal waters does not appear to have been recorded." Since this was written we find that Dr. Wallich, in the *Ann. and Mag. of Natural Hist.*, vol. ii. 1868, p. 319, stated "Coccospheres have been met with by me profusely . . . in material collected at the surface of the open seas of the tropics, and also in dredgings from shoal water off the south coast of England."

November 18. J. JOLY.

HENRY H. DIXON.

#### Phenomena Exhibited by Jackson Tubes.

WHILE investigating the best methods of working the ordinary form of Jackson tubes during the last fourteen months, I have noted the following interesting phenomena.

Four tubes developed a phosphorescent ring or halo rotating rapidly round the anode, which by carefully heating became comparatively steady; this I ventured to name the Saturn condition.

Four tubes developed in bulb broad bands of light yellow-green electrical molecules, interspaced with darker bands; this was like the marking of the planet Jupiter.

Two tubes developed a mottled and leaf-patterned electric-molecular condition, extremely like the appearance of the photosphere of the sun (for the first time the skin of my hand was affected by one of these tubes—November 1896; this hand having some years previously had gouty eczema; the other hand was not affected in either case).

Two tubes developed forms like the clouds known as “mares'-tails”; one tube, a form like the sulky lower strata of distant thunder-clouds.

The most interesting phenomenon was one which was also seen by a medical friend: the whole tube was a mass of yellow-green phosphorescence, even behind the kathode; the molecular film in glass bulb in front and round the edge of the kathode (mottled condition) developed a small black spot the size of a pin-head, which increased to the dimensions of a small pea, broadened out into an irregular patch, split up into small spots, which ran round the bulb, disappeared; reformed into a patch—diminished—and disappeared. The phenomenon was repeated at regular intervals for ten minutes, then finally stopped. The irregular patch was extremely like a sun-spot.

From time to time I have called the attention of interested friends to the above phenomena, so as to have witnesses, as the tubes seldom repeat the same conditions, which can only be attained by the application of heat while working the tube.

The rays magnetised my watch on two occasions; an induction coil having no magnetic field, owing to interrupted current, could not do this.

WILLIAM WEBSTER.

Art Club, Blackheath.

#### REMARKABLE TERMITE MOUNDS OF AUSTRALIA.

THE destructive propensities and architectural endowments of the termites or white ants are familiar subjects to most travellers and residents in tropical countries. Notwithstanding, however, the almost cosmopolitan distribution within tropic areas of these insect pests, an astonishingly small amount of accurate data has been chronicled concerning their specific varieties or the widely varying modifications of their social tenements.

As a matter of fact the figures and descriptions of the insects and nest mounds or “termitaria” of the African white ants *Termes bellicosus*, *T. mordax*, and other species contributed by Henry Smeathman to the *Transactions* of the Royal Society for the year 1781, constitute up to the present date the standard account of white ants and their ways that is reproduced with trivial variations in most modern zoological text-books. Much, undoubtedly, has been accomplished within recent years, notably through the investigations of Grassi and Sandias, Fitz Müller, and other biologists to elucidate the minute anatomy, individual modifications, and social economy and relationships of the indigenous or imported South European types *Termes incifugus* and *T. flavipes*. Neither of these forms, however, are mound constructors, but live within subterranean tunnels or in excavations of the wood which they devour. Smeathman is hence still left, *facile princeps*, the first, almost the only authority on the architectural fabrications of the mound-constructing species.

While Africa in connection with Smeathman's investigations has hitherto inherited an undisputed monopoly in the matter of termite mounds, it will probably be found that the island continent of Australia can produce an equally, and in some respects even more noteworthy variety of these insect edifices. So far as altitude is concerned, the palm among the Australian series must be conceded to the huge buttressed columnar termitaria that occur some forty miles inland from Port Darwin in the Northern Territory of South Australia. A height of at least eighteen feet is not unfrequently attained by this variety, and their diameter being almost equal throughout, their appearance

has been appropriately likened to miniature towers. Termitaria almost equal in altitude to this Port Darwin variety have also been observed by the writer in York Peninsula, North Queensland, and are notably abundant on the point of land abutting upon the mainland fore-shore of the southern entrance to the Albany Pass. The largest termitaria of this type occur, however, in the vicinity of the bridle path between Mr. Frank Jardine's homestead at Somerset, and the former telegraph station at Patterson facing Endeavour Strait. Passing them on horseback, many of these mounds were observed to tower considerably above the rider's head. The contour of these York Peninsula termitaria differs essentially from that of the Port Darwin form. In place of being subcylindrical or columnar, they are distinctly pyramidal, widest at the base, and tapering up to a single, or it may be occasionally several acuminate points.

Within the tropical area of Western Australia, known as the Kimberley district of that colony, a third large and very distinct type of termitarium is dominant. While most commonly presenting a symmetrically conical or hemispherical contour, it not unfrequently happens that these white ant mounds are built up into the most irregular and fantastic shapes. Throughout all such innumerable modifications, however, one essentially unique fundamental plan of structure is predominant. This is exemplified by the circumstance that each nest mound or termitarium presents the appearance of having been built up, as it were, by the superposition of consecutive hod-loads of half solidified mortar, and which before setting has partly overflowed and overlapped the preceding instalments.

This lobulated or Kimberley type of termite mound, as it may be designated, occurs in great abundance and in its finest development in the thinly wooded scrub or so-called “pindan” in the neighbourhood of Derby, at the head of King's Sound. One of the tallest of these termitaria was found to measure as much as fourteen feet, but this altitude is occasionally exceeded. The separate occasions on which the writer visited King's Sound were utilised by him for obtaining information concerning the approximate time that is occupied by the termites in the reconstruction of a partially dismantled edifice. Examples of termitaria about eight feet high were bisected vertically, the one half being completely demolished. Within twelve months one quarter of the denuded area had been filled in. Visited eighteen months later, fully two-thirds of the demolished moiety had been rebuilt, and it would evidently have not taken more than another twelve-months, or a total of between three or four years, to restore the mound to its original symmetrical shape and dimensions.

The most remarkable, though by no means the most lofty of the termite edifices peculiar to Australia, are those modifications of these structures which are popularly known by the local titles of “meridian,” “magnetic,” or “compass” ants' nests. The termitaria belonging to this category are distinguished by their elongate, much compressed contour, comparable in the most evenly constructed examples to huge slabs of undressed sandstone set up on edge. The upper edge or ridge of the “Meridian” termitarium is always the narrower, and is either nearly smooth, irregularly serrated, or may be developed into a series of slender pinnacles. The most notable feature respecting these white ant mounds is, however, the circumstance that the orientation of their longer axis is always coincident with the local parallel of latitude, or, in other words, in a precise line with the north and south points of the magnetic compass.

The most striking examples of these meridian ants' nests observed by the writer occur in the Laura Valley, North Queensland, some sixty miles from Cooktown. The altitude of these Laura Valley ant mounds is not very considerable, rarely, indeed, exceeding six or eight