

Dowsing and Archaeology

Is There Something Underneath?

.....

An examination of the available published evidence for dowsers' ability to trace hidden archaeological features shows that field tests were badly designed and executed.

MARTIJN VAN LEUSEN

Next to buried treasure and water, archaeological remains have long been the object of dowsers' efforts. Professional and student archaeologists regularly encounter local dowsers during fieldwork, sometimes accepting their offers to provide help by dowsing the site under excavation. Archaeological dowsing techniques are essentially identical to the techniques used for water dowsing. The position of the dowsing rods, one held in each hand, is inherently unstable so the points easily deviate up to 90 degrees either side of the "straight forward" or resting position. The dowser moves over the area, interpreting and mapping the movement of the rods until archaeological features have been located (see Figure 1).

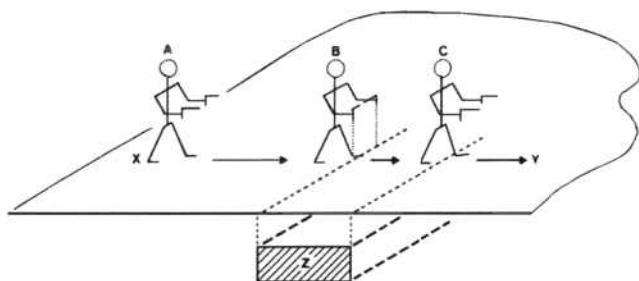


Figure 1: The technique of archaeological dowsing as portrayed in Bailey et al. (1988, Plate 14 and figure 32). Note that the movement of the dowsing rods at B and C precludes any uncertainty about the nature of the interfaces. The photo at right shows proper stance and hand position for dowsing.

In my own work, studying the buried Roman city of Viroconium and its hinterland in modern-day Shropshire (U.K.), I have been offered help by local dowsers whose activity at the site went back at least sixty years:

A diviner who believed that gold treasure lay under the ruins of Viroconium, the Roman city near Shrewsbury, was permitted to excavate at a spot where the divining rod appeared to give the most pronounced indications of metal. A stone weighing half a ton had to be removed, and then digging to a depth of six feet gave a negative result. (*Antiquity* 8:350—*Birmingham Daily Mail*, 13 April 1934)

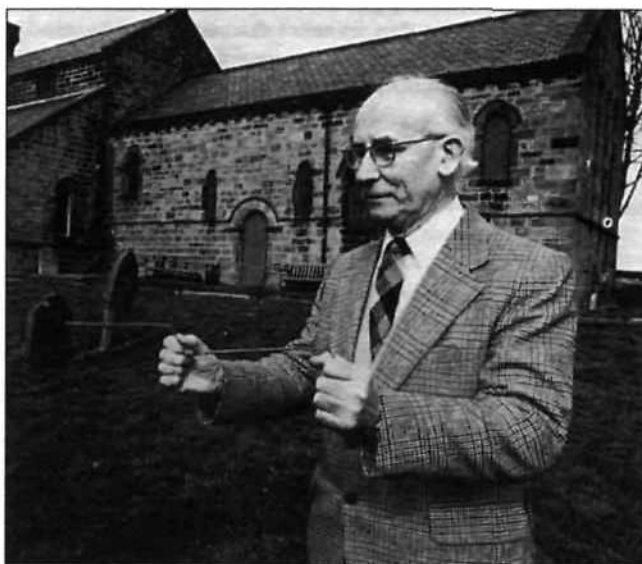
Moreover, in informal contacts with fellow archaeologists both in the U.K. and in the Netherlands, I found many who believe there is something worthwhile in dowsing, and few that have categorically denied its value; however, neither belief appears to be based on any serious study of the evidence.

Yet if dowsing were found to work, it would not just add a valuable new tool to the modern archaeologist's toolkit of non-invasive prospecting techniques; it would also constitute a major scientific discovery in biology and physics. So, if even we professional archaeologists think it might work, you would expect us to study it, right? Not so—hardly anyone ever mentions the subject during scientific get-togethers. Why should this be? Do we shy away from it for fear of losing our academic standing? Are a few lone and brave proponents being ignored by the scientific establishment?

I decided the best place to start my research would be the directly related field of archaeological prospection.

Noninvasive Archaeological Prospection

Many practitioners and proponents of dowsing advocate an openly paranormal view of the phenomenon, in which the practitioner has the extraordinary powers needed to detect buried archaeology (some even claiming to do this by dowsing from maps) or the archaeological features radiate some paranormal "force" (as in the "energy" and "ley lines" emanating from Stonehenge and other important sites; see Hancock 1998). Although dowsing has therefore been one enduring



theme within psychic archaeology in general (Cole 1980, 14), such views do not win many converts among professional archaeologists. Rather, the alternative view that dowsing is based on some physical force that some (or all) people are sensitive to, especially when aided by dowsing rods, seems to be the one that is regularly encountered among students and professional archaeologists. The main candidate for this physical force is taken to be magnetism, which, in the form of Earth's magnetic field, several species of bacteria, birds, and perhaps some mammals have been shown to be sensitive to (Williamson 1987). Proponents of dowsing argue that humans are similarly sensitive to the weak magnetic fields generated by some buried archaeological features.

Contrary to popular belief, archaeologists do not always excavate—they will use the research method that does the least possible damage to buried archaeology given the research objectives. Many methods, such as geophysical surveys, do no damage at all and are far less costly than excavation as well. These are called *noninvasive prospecting* methods. Just about every part of the electromagnetic spectrum has been harnessed over the past few decades in order to prospect for archaeological remains. The workhorses of archaeological geophysics today are the *resistivity meter* and the *magnetometer*, both originally developed some forty years ago (and refined ever since).

The resistivity kit is an example of an active survey tool; it consists of a portable frame with two probes that are pushed into the ground at regular intervals. A current potential is set up for each measurement and the resistance of the ground to that current is measured and logged for later display and analysis on the computer. The kit detects electrical properties of the soil that are mostly caused by variations in water content and chemical and physical composition of the soil. For example, a buried stone wall will have almost no current-carrying ions available, and a current potential set up across it will therefore meet with a high resistance. A buried ditch with a humic soil filling will have lots of ions able to move and will therefore register a low resistance. By recording resistance values at regular intervals within a measured grid and translating them into on-

Martijn van Leusen is at the Groningen Institute of Archaeology, Poststraat 6, 9712 ER Groningen, The Netherlands. E-mail: p.m.van.leusen@let.rug.nl.

screen grey scale values, a "map" of the main subsurface features can be built up fairly quickly.

Magnetometry is an example of a passive survey method, the hand-carried instrument continuously recording subtle gradients in the local earth magnetic field which are mapped in a manner similar to that described above. Such gradients are caused by many buried man-made materials (for example tile, pottery, and metals) and also by burning (hearths, kilns, house fires). Interestingly, these gradients are so weak that the surveyor must wear special nonmagnetic clothes and shoes in order to obtain useful results—thus, there is a huge difference between being able to detect the direction of Earth's magnetic field, which has a typical strength of about 50,000 nanotesla (nT), and being able to detect the local deviations in that field caused by near-surface buried archaeology. The latter are on the order of only a few nT in strength, about ten thousand times weaker than Earth's magnetic field itself. The suggestion that dowsers are sensitive to local variations in field strength is therefore unlikely *a priori*. For full details of these methods and their application in archaeology, see the excellent reference texts by A. Clark (1996) and Weymouth (1986).

More recently, the reflectance of sunlight from soil and crops in multiple wavelengths all the way from ultraviolet to infrared, and the "echo" produced by sending radar waves into the ground (ground penetrating radar or GPR) have also been put to the service of archaeological prospecting. Since the late 1970s archaeologists have employed multispectral imagery from the Landsat and SPOT satellites and, since the late 1980s, various airborne remote sensing platforms to extend the range of noninvasive data from which archaeologically relevant information could be gained (Archaeological Data Service forthcoming; El-Baz 1997). Today, all these methods of geophysical survey and remote sensing are widely employed by archaeologists because they are efficient, relatively cheap, fairly well understood, and do not destroy what remains of our distant past.

So what do professional archaeological geophysicists think of dowsing? An Internet trawl on the keyword "dowsing" brought up only one significant mention—the University of Southampton (U.K.) Department of Archaeology offers a short practical course introducing the use of geophysical techniques in archaeology. Students do "a blind dowsing test" comparing dowsing to results obtained with standard geophysical equipment. When I asked for more details, the course tutor explained that she feels dowsing is "not a science, nor unscientific" since nothing at all is known about it. To her it is "an interesting phenomenon which no one has the time or appropriate scientific background to investigate objectively and with a properly devised methodology." She added that dowsing is "not a gift, as anyone can get a result of some sort" (Kate Clark 1996, pers. comm.).

Others do not take such an open-minded stance. A recent technical review paper published by the British Institute of Field Archaeologists, until recently Europe's only professional body for archaeologists, discusses noninvasive surveying at length. The subsection on dowsing reads in full:

"This technique has long been practiced by archaeologists. Unfortunately the scientific principles, if there are any, are not understood, and as such the technique should not be used for evaluation purposes." (Gaffney, Gater, and Ovenden 1991, 6)

The reader might be forgiven for thinking this an example of scientific closed-mindedness. After all, not knowing the physical basis for dowsing does not in itself invalidate the technique. Compare this to the final paragraph of the section on dowsing in a well-known treatise on archaeological prospecting:

"Many controlled tests of dowsing have proved totally negative, and many results remain speculative and untested, or scientifically incredible, for instance the 'imprint' effect, by which the dowser appears to be able to detect structures no longer present. But the growth of knowledge has overturned scientific orthodoxy more than once, and it is seemly to keep an open mind." (A. Clark 1996, 123)

The author notes the then-recent publication of *Dowsing and Church Archaeology* (Bailey, Cambridge, and Briggs 1988) for its use of proper scientific experiment in studying dowsing. I will discuss this important publication in some detail further on.

Separating actual *proof* that dowsing works from the mechanism that *allows* it to work, we see a range of different reactions to the phenomenon. Gaffney et al., while admitting dowsing is used in practice, advise against its use because no mechanism has been established; they do not comment on the availability or quality of the evidence at all. A. Clark (1996) discusses one possible mechanism (human sensitivity to magnetic fields) and returns a verdict "not proven," then goes on to give favorable mention to experimental work that seems to indicate that dowsing does sometimes work. Finally, Dr. Kate Clark is aware that no scientific explanation is available for dowsing yet, but accepts subjective evidence that it works in practice.

These, then, are the opinions of some of the best professional archaeological geophysicists in Britain. Dowsing is seen as residing somewhere on the edges of science, a phenomenon established enough (if only by anecdotal evidence) to merit mild professional interest, but not respectable enough to be firmly associated with true "fringe archaeology" (Van Leusen 1996). Geophysicists' opinions seem to be less positive about dowsing than the *informal* opinions of nongeophysicist archaeologists. Why should this be so? Perhaps archaeological geophysicists attach more importance to knowing the *mechanism* behind dowsing, whereas other archaeologists are more interested in knowing whether it *works*—that is, whether claims of dowsed features coincide with actual archaeological features.

A review of attitudes toward dowsing both in the general and the archaeological literature shows that, as 1960s and 1970s New Age thinking made its mark in academia generally, a more favorable view of dowsing slowly made its way into influential introductory books on archaeology in the U.S., Britain, and parts of western Europe (e.g., Noël Hume 1969, 37–38; Greene 1983, 51; and Rahtz 1985, 127). A study by Feder (1984) shows that, by the early 1980s, dowsing was the fringe claim least likely to receive negative treatment in class by

Dowsing and Church Archaeology



by Richard N. Bailey
Eric Cambridge
H. Denis Briggs
With a foreword by Charles Thomas

Intercept

Figure 2: Cover of *Dowsing and Church Archaeology*, often cited as the strongest case yet made for the reality of dowsing in archaeology.

perceive tests with negative outcomes as failures and leave them unreported.⁷

One other reason why geophysicists might be more cautious about dowsing may be that, in general, they have a more science-oriented educational background and are therefore less prone to accept anecdotal evidence. In contrast, many “digging” archaeologists have little if any education in scientific methodology such as the use of controlled tests. To explore these possibilities, I reviewed published archaeological field tests of dowsing.

Field Tests of Dowsing

Just as water dowsers tend to locate underground streams and sources, ignoring the fact that such features only occur in specific geological situations (e.g., Karst landscapes) and that it is difficult *not* to find water in most places, so the archaeological dowser often has a predilection for buried treasure, walls, or graves. Such features have an appealing conceptual clarity that should make for easy field testing. Witness the report of the early unsuccessful dowsing attempt at Viroconium—a gold treasure is either there, or it isn’t. In another early field test carried out by Aitken (1959) the question of whether the dowser was able to pick up typical magnetic field strengths associated with buried archaeological features was studied. Aitken compared the locations of dowsed features with those of strongly magnetic Roman pottery kilns known through excavation and geophysical prospection and found that the dowser had not been able to pick these up. These examples illustrate two important ingredients of successful scientific testing—simplicity and controls—which have been sadly lacking in more recent work. This is exemplified by the publication, in 1988, of a book about dowsing and church archaeology, written by two academics and a retired engineer (Bailey et al. 1988. See Figure 2).

professional teaching archaeologists and was the most likely to receive positive (13.5%) or neutral (16%) coverage. By the early 1980s, therefore, treatment of dowsing by archaeological educators was relatively positive. More than one generation of today’s archaeologists has been raised on such fare, explaining in part the favorable attitudes I have encountered among colleagues. Such beliefs must have received further reinforcement through selective reporting—the tendency to

Dowsing and Church Archaeology

With a foreword by yet another academic, the book was presented as a serious research effort. It convinced at least one reviewer of the essential validity of the technique (Rahtz 1988) and is often cited as providing the strongest evidence yet to substantiate dowsers’ abilities in locating buried archaeological features (e.g., Clark 1996, 123; Locock 1995; and Wilcock 1996). The authors claim that dowsing was successful in tracing buried features in eight out of eleven tests. These successes were reportedly obtained without the benefit of documentary evidence and other extraneous clues, and several were claimed to be accurate to less than 3 centimeters at depths up to 1.4 meters. If true, such accuracy would compare favorably with that of all other archaeological prospecting techniques! Since it is the only published full-length scientific study on the subject, *Dowsing and Church Archaeology* clearly deserves a thorough examination.

The book is well written, and the early chapters describing the history and aims of church archaeology, the subterranean structures associated with churches, and the use of conventional geophysical devices are interesting in themselves if not particularly relevant to the actual dowsing tests. The second, and greater, part of the book presents the case for dowsing as a possibly useful technique by detailing a series of case studies where dowsed maps are compared with the results of excavations in and around churches.

Church archaeology, as a specialty within the general field of archaeology, is particularly fraught with practical difficulties. Churches tend to be the most stable elements in archaeological landscapes, both preserving and making inaccessible remains often dating back as far as the Anglo-Saxon period. Remains are often preserved because churches were rebuilt and expanded at the same location over and over again, with earlier phases partly preserved underneath later buildings. But they are also made inaccessible, because in addition to the difficulty of having a standing building of doubtful structural integrity on top of the archaeological remains, there are often restrictions of a religious nature if the building is still in use as a church or if (as is very often the case) people have been buried inside as well as around it. So, with more than one thousand years of building phases superimposed, plus the likelihood that only “keyhole” archaeology can be conducted, churches must count among the worst places in which to conduct dowsing tests.

The authors of *Dowsing and Church Archaeology* argue that a noninvasive method of tracing earlier building phases (which by their morphology would give the archaeologist clues for dating and function) would be a major step forward for church archaeology. They proceed to argue that dowsing merits a more thorough and open-minded evaluation than it had received up until then. Commendably, they set out a number of “arguments which, although superficially convincing, must be rejected as unassailable proofs of the dowser’s capabilities” (Bailey et al. 1988, 33ff). Briefly, these are: 1) the presence of visual clues, 2) the availability of documentary information,

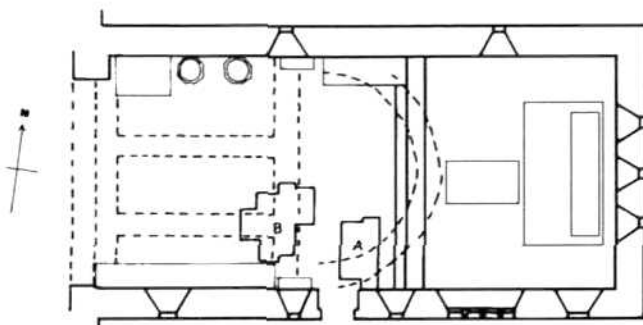
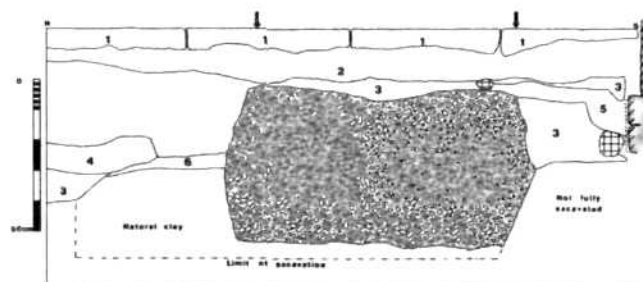
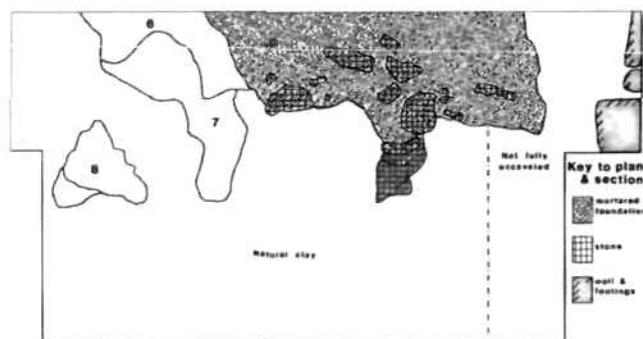


Figure 3a: Plan of St. Mary's Church, Woodhorn, with dowsed features indicated in dashed lines. Test trenches A and B were dug to confirm the presence of three wall foundations. Nothing was found in trench B. After Bailey et al. 1988, figure 6.



Section



Plan

Figure 3b: Enlarged plan and section of trench A, showing the mortared foundation that was found exactly where the dowser had indicated one. After Bailey et al. 1988, figure 7.

and 3) general plausibility. The authors emphasize that, although they find it unlikely that the dowsers in their experiments ever used such extraneous sources of knowledge, the need to exclude this possibility from their experiments is recognized.

In other words, although they are aware of the need for experimental controls, they have chosen the test environment very poorly, apparently putting their desire to find a solution for the archaeological problems posed by church buildings before their desire to test dowsing per se.

The core of the book consists of a presentation of nine excavations and one watching brief (one excavation is later split into two separate observations, yielding a total of eleven

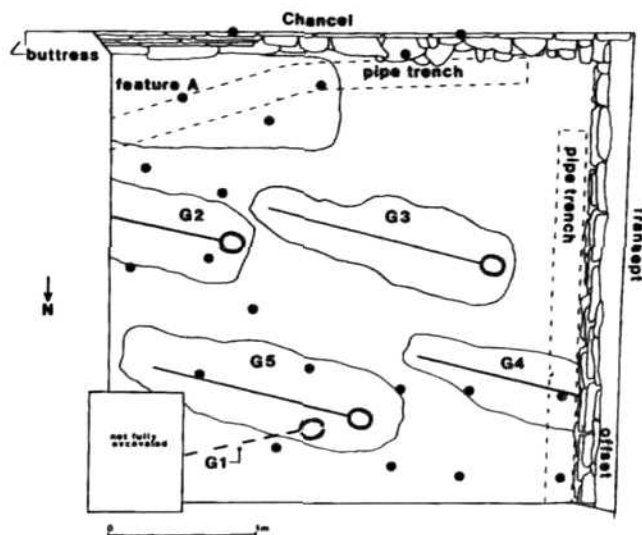


Figure 4: Plan of the excavation trench at St. Mary's Church, Ponteland, the aim of which was to test the presence of a curved wall foundation indicated by the two parallel rows of dots. G1 – G5 are graves. The pipe trenches, feature 'A' and the irregular stonework in the chancel wall all figure in Bailey et al.'s explanation of why no trace of the foundation was found. After Bailey et al. 1988, figure 20.

tests) that were conducted after dowsed plans had been obtained with the help of up to six dowsers, and for which, the authors contend, no prior visual or documentary evidence was available. Significantly, right from the start no further mention is made of their third experimental control, that of disallowing general plausibility.

Only two of the excavations, at Woodhorn and Ponteland, were specifically mounted in order to test dowsed plans; the others were opportunistic excavations wherever building works allowed the researchers to check on the dowsed plans. These two should therefore yield the most unambiguous evidence for the validity of dowsing. Yet, by the authors' own account, at St. Mary's Church, Woodhorn, they found a wall foundation where the dowsers had indicated one in the first of two excavation trenches, while the second trench uncovered no remains of *any* of the predicted junctions of linear features (45–49, see Figure 3). Again, at St. Mary's Church, Ponteland, *no* apse foundations were found where the dowser had indicated them ([70–74], see Figure 4). A charitable reckoning would therefore claim one hit and two misses here—yet the authors sum up the results as two hits and one “undecided”!

They reach this remarkable conclusion by citing, in the Woodhorn trench two case (69–70), documentary evidence that the dowsers picked up “imprints” of *temporary* wooden structures rather than extant wall foundations, and in the Ponteland case (74–81) excavated evidence that an apse had originally been there but had been *completely* destroyed in later construction phases. It is instructive to separate the authors' archaeological reasoning here from their discussion of the dowsing test itself. Their detailed reconstruction of a series of building phases at Ponteland, resulting in the complete removal of an early apse, is quite valid; however, their conclusion that experiments at both sites support the validity of

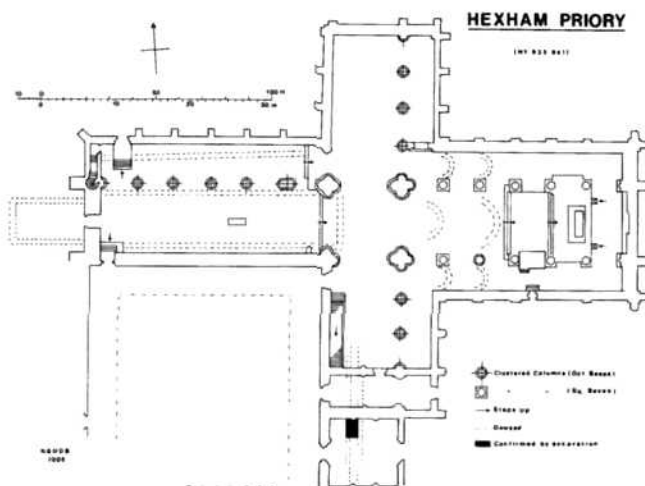


Figure 5a: Plan of Hexham Priory, with dowsed features indicated in dashed lines. A trench was dug in the southern vestibule area through what was obviously intended by the dowser as two parallel wall foundations. Bailey et al. claim the result was a clear hit: 3 out of 4 dowsed lines were found to coincide with archaeological 'interfaces'. After Bailey et al. 1988, plan 19.

dowsing relies completely on the hypothetical "imprint" effect, by which dowsers can apparently trace the former existence of structural and even temporary features for which *no physical evidence whatsoever remains*.² In the process they relinquish what limited experimental control they had established, for they employ documentary evidence to prove the former existence of temporary wooden features.

The authors follow a similar pattern at the other minor sites. At Hexham an excavation is carried out to test four dowsed lines, interpreted by the dowser as indicating two parallel foundations. Instead, one trench cut and one foundation are found, with no archaeological features coinciding with the fourth dowsed line (50–53, see Figure 5). The authors here again employ documentary evidence to prove that a foundation existed at this spot, breaking their own rules for admitting evidence.

In addition they choose to ignore the dowser's own interpretation when it suits them—strictly speaking, *none* of the four interfaces were found as predicted. At Kyloe no evidence to substantiate the dowsed lines was found in one of two trenches; the second trench yielded ambiguous evidence interpreted as strongly positive (the dowser is said to have "very accurately located the inner line of a feature at a depth of 1.21 meters below the surface." [58] See Figure 6). At Durham (58–60) virtually nonexistent evidence is blown up to provide "might be" evidence for dowsing. At Newcastle (60–63) the dowsed lines are linked to a very minor feature not related to foundations, which from the dowsed plan is clearly what the dowser "found." At Morpeth, finally, a foundation interface is found at one of the dowsed lines (64).

Reading through these cases, one finds an increasingly clear pattern. All the archaeological discussions were fine, which is how it got by some of its reviewers and many of its readers, but the dowsing "tests" were so vaguely defined and uncontrolled that it would hardly have been possible to *disprove* the exis-

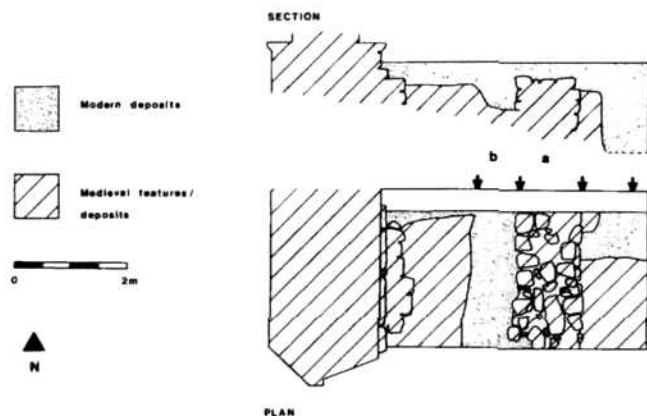


Figure 5b: The plan and section of the trench at Hexham Priory. Instead of the two parallel walls indicated by the dowser (see arrows), one wall foundation was found where it should not be (see also Figure 1); moreover, the existence of documentary proof for this wall should have led the excavators to discount it as evidence. The excavators further decided that the easternmost line must have indicated the presence of a modern trench cut, whereas no such 'interface' could be found for the westernmost line. After Bailey et al. 1988, figure 9.

tence of some archaeological feature at a dowsed line. But how exactly have Bailey et al. managed to do this?

To assess the outcome of each test, one needs to know the prior probability of finding an archaeological feature in any particular location associated with a church. In many excavations archaeologists document hundreds if not thousands of "contexts" and "features," any of which might coincide with a dowsed line. For this reason, attempting to test dowsing on any but the simplest of sites is a bad idea. Yet the authors do not discuss this at all. Thus they have no yardstick against which to decide whether the tests do or do not support the hypothesis that dowsing works, and are forced to operate at a much simpler level, namely that of accumulating instances of negative or positive evidence, "hits" and "misses."

They then go about redefining the test parameters such that the prior probability of a "hit" grows whereas that of a "miss" decreases. If they do not find a foundation interface where one is indicated by the dowser, and they cannot convince themselves that a foundation had been there in the past, they simply disregard the dowser's interpretation. No foundation at Kyloe? No problem, there is a weak and deep interface which will serve to count this as a hit and to double as evidence for the high quality of the dowsing response. The reverse also happens. Found a major stone feature at Newcastle where none had been predicted (62)? No problem, the dowser had been "targeting" foundations (88) and was therefore insensitive to other types of features. Never mind that these hypotheses contradict each other. . . .

But of course the most infamous example of this type of reasoning is the "imprint" hypothesis, whereby dowsers locate features that have been *totally* destroyed (as at Ponteland) or otherwise removed. In one case the authors argue that the dowsers had picked up the imprint of wooden plinths that had been removed (67–70, see Figure 7). They are aware of the danger of using such an argument (88ff) yet feel that it is

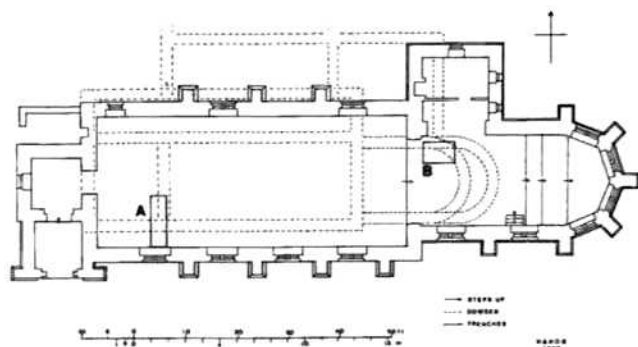


Figure 6a: Plan of St. Nicholas' Church, Kyloe, with dowsed features indicated in dashed lines. Trenches A and B were dug to confirm the presence of two junctions of the dowsed wall foundations. Nothing was found in trench A. Bailey et al. claim a 'hit' was scored in trench B. After Bailey et al. 1988, figure 10.

admissible if the former existence of the feature can be proved. Of course this would require exactly the kind of evidence that the authors specifically excluded at the outset—visual, documentary, or general plausibility!

By such means, the authors extend the range of outcomes they can count as a "hit" until it is hard to think of circumstances that they would be willing to count as a "miss." Basically, *any type of evidence* that indicates the (former) presence of *any type of "interface"* has been ruled admissible, even if it flatly contradicts the dowser's interpretation or has been expressly disallowed by the authors themselves. In the authors' topsy-turvy world, the very weakness or obscurity of the link between evidence and prediction now serves claims of high accuracy and surprising sensitivity—how else could the dowser have picked up, with an accuracy of a few centimeters, some minor feature at a depth of over one meter, or the presence, some decades ago, of some piece of furniture in this very spot?

Subsequent Field Tests

In a more recent trial, Locock (1995) did only slightly better when he arranged for a dowser to map archaeological features alongside existing but back-filled excavation trenches at the historic garden site of Castle Bromwich Hall. The locations of the dowsed points were compared with archaeological and geophysical evidence for the existence of major buried features at those points, and a scoring system applied. Locock recognizes that dowsing "hits" might simply reflect the density of archaeological features on the test site, and he wholly rejects the "imprint" hypothesis. Of a total of nineteen points so tested, six were found to have been located close to major buried features, four were "within 1 meter of some change in buried deposits," and nine were not located near any buried feature.

To assess the significance of these results, one needs to know what experimental controls were in place. Did the dowser have access to visual or historic clues to the location of buried features? We are told that the dowser had previously worked on several other historic garden sites; and he success-

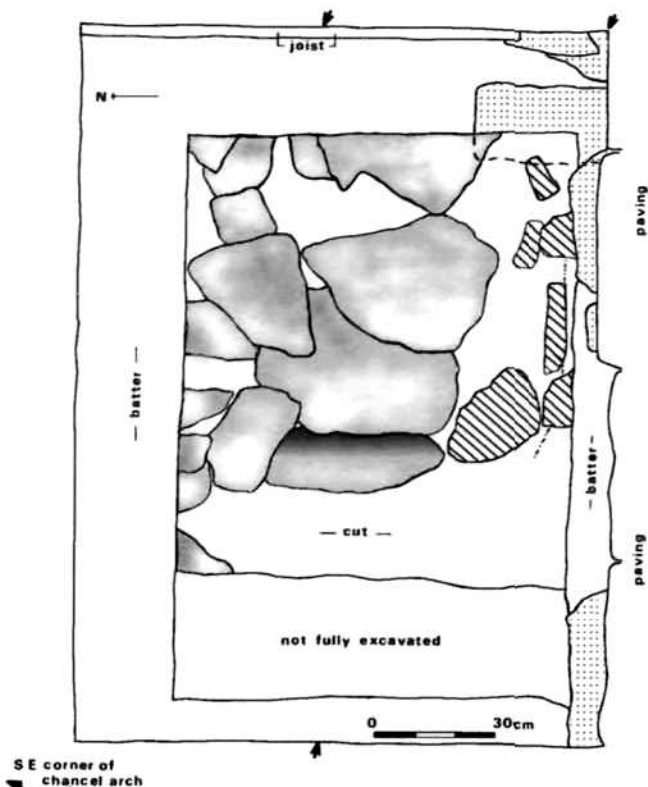


Figure 6b: Excavation plan for trench B at St. Nicholas' Church, Kyloe. The arrows indicate the edges of the dowsed nave foundation. On the basis of the stones found at a depth of over one meter in this very small (just over one square meter) trench, Bailey et al. claim that the dowser 'accurately located the inner line' of the nave. After Bailey et al. 1988, figure 11.

fully located three iron pergola posts; would a pergola not be located in a predictable position (south-facing, parallel or at right angles to existing buildings and walls)? The other three "hits" were points close by a large masonry culvert that ran across a lawn otherwise free from buried features. The dowser also located two incorrect points there. Without knowing the relative sizes of the lawn and the culvert we simply don't know whether this represents a significant deviation from random chance.

It is clear that Locock, like Bailey et al., is not aware of some of the pitfalls involved in deciding whether a particular outcome is statistically significant. He states that the test produced "evidence suggesting that [dowsing] performed better than random selection for metal objects, but not for old soil disturbance or some masonry features." This is equivalent to having a hundred people flipping coins, selecting the few who, according to chance, will have flipped a lot of heads, and then claiming these "perform better than random in picking heads."

Painful Lessons

There is a lot to be learned from these failed attempts at proving the reality of archaeological dowsing. They highlight the unfamiliarity of archaeologists with formal test design and the uncontrollable nature of archaeological test environments.

The core of the problem, I believe, is the complexity of real-

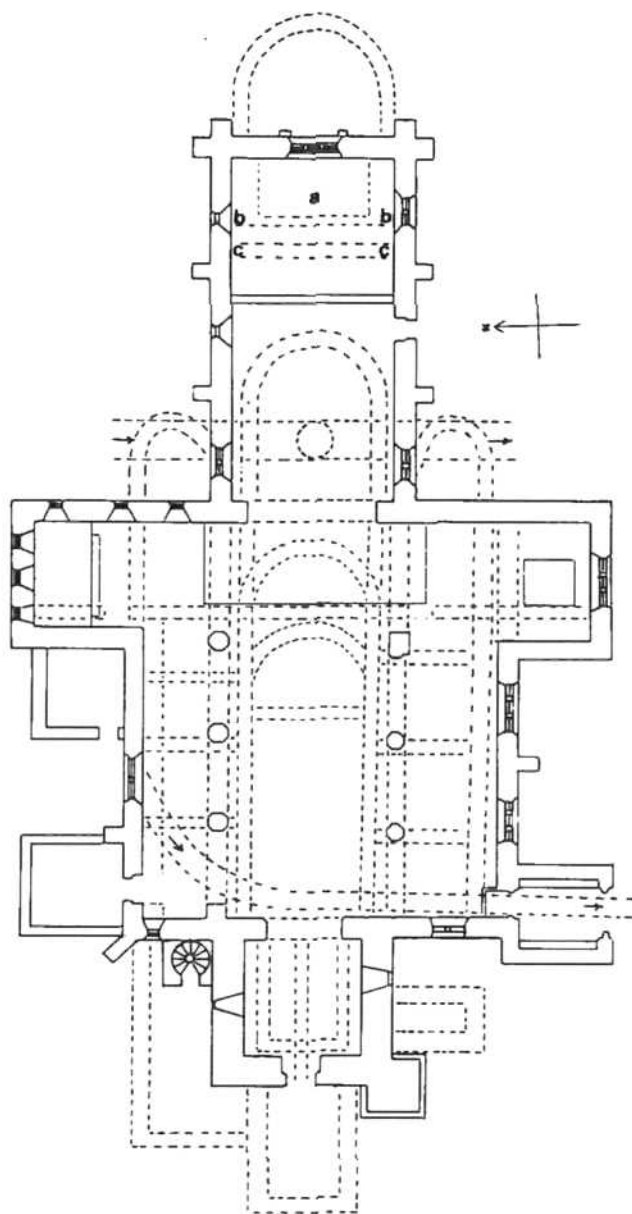


Figure 7a: Plan of St. Mary's Church, Ponteland, with dowsed features indicated in dashed lines. Note dowsed feature A near the altar. After Bailey et al. 1988, figure 17.

life archaeological environments, which makes the design of good tests almost impossible. The main effect here is the very high probability of a "hit" especially when the exact criteria for a hit are left undefined. Another consequence is the difficulty of producing, from a small observation trench, a reliable plan of the archaeological features. Bailey et al. employed a series of generally very small interventions from which they claim to be able to extract exact directions, curves, and angles of linear features—there must be some doubt as to whether it is in fact possible to do this to the required accuracy.

The second reason for failure is a basic lack of understanding among archaeologists, due in part to their lack of education in these areas, about the nature of proof and probability,

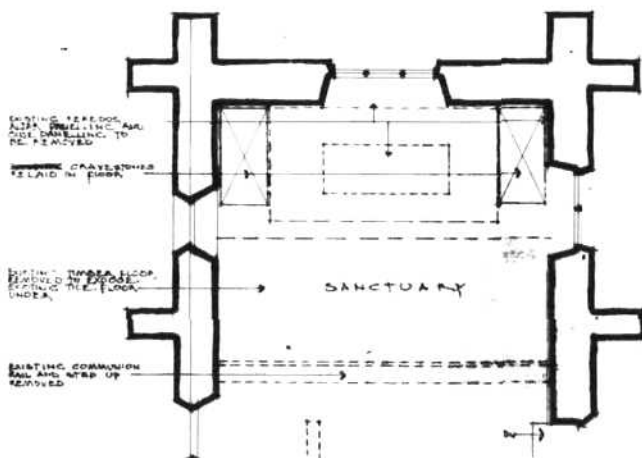


Figure 7b: Architect's plan for the altar area of St. Mary's Church, dating to 1972. Bailey et al. used this documentary evidence for the former presence of a wooden altar platform to argue that the dowser had been picking up an 'imprint' when mapping feature A. After Bailey et al. 1988, figure 18.

and the importance of controlled test conditions. I have already discussed some examples of this; one more will serve to drive the point home. Among the three sources of extraneous information mentioned by Bailey et al.—visual and documentary evidence and general plausibility—the one most difficult to exclude from experiments is that of general plausibility.³ If the dowser produces a plan typical of Norman churches, how do we know that he is not simply proceeding from his general knowledge of such plans? In fact, if one looks at the thirty or so church plans included in an appendix to *Dowsing and Church Archaeology*, it is quite clear that a pattern was adhered to by the medieval architects and builders. The evolution of church buildings generally proceeds along a limited number of possible lines occurring in certain roughly datable waves. For instance, extensions of the main church building at the apsidal end are fairly common. This makes it very difficult to assess the dowser's performance should he have correctly dowsed such a buried feature.⁴

The same problem bedevils Locock's attempts to establish whether his dowser's performance was above chance. As I have argued above, this problem can be avoided only by giving absolute priority to control of the test environment, either by restricting the test to one isolated archaeological phenomenon (as in Aitken 1959) or by creating an artificial test environment (as in Randi 1979; see also König et al. 1996). Simple tests such as these have unambiguous outcomes, whereas messy ones are open to wildly divergent interpretations. Where tests cannot be carried out under such restrictions, various simple ploys can be used to avoid the more obvious pitfalls. For example, blindfolding the dowser can eliminate many extraneous effects that otherwise complicate or even invalidate field tests.

Conclusions

At the core of it all, as always, there is the "will to believe."

Belief in dowsing, despite the protestations of its adherents, is not a rational matter. The question of dowser's sensitivity to weak magnetic fields is a case in point. As we have seen, the *a priori* argument for such sensitivity is extremely tenuous. In tests, Aitken (1959) reached a negative conclusion while Locock (1995) was rather more positive. So what? Perhaps Aitken's dowser was not very good, or had a bad day. Who knows? However many times one would prove that a particular dowser could not perform above chance level, their number will always be far outweighed by myriad anecdotes to the contrary. This is the old "proving a negative" problem—somewhere, sometime, there may be someone who is sensitive to weak magnetic fields. . . .

Such an attitude is of course easier to maintain if one does not investigate dowsing too closely—and indeed, given the claims put forth by some archaeologists there is a surprising lack of enthusiasm for studying dowsing in a manner similar to other noninvasive prospecting techniques. Although the danger to their reputations may be one reason, I would suggest here that, paradoxically, most archaeologists judge that investigating dowsing is not a good use of their time, because in essence they see it as a *supernatural* phenomenon! This is not a reason for rejecting it—instead, it puts dowsing beyond the pale of scientific pursuit. In seeing no conflict, academically trained archaeologists are no different from the rest of us. We tend to apply logic and reason to some areas of our lives, while happily suspending skepticism in others. Academic training is of little or no relevance here.

The impact of the Internet as a new and easily available information source is as yet unclear. Will the accessibility and "authority" of Web pages lead to a further growth of public faith in paranormal claims? One obvious route for this to happen will no doubt be through journalists who are strapped for time when doing background searches. Scientists should counter this by providing Web pages that offer quality information to the public (Van Leusen 1996).

It is clear that archaeologists have not yet come to terms with dowsing. Where it has been the subject of tests, the tests have been so poorly designed and executed that any conclusion whatsoever could have been drawn from them. The fact that such tests are usually carried out only by researchers with a prior positive view of dowsing means that the conclusions will likely also be positive. The normal processes of peer review and scholarly discussion have also failed to uncover the lack of properly controlled test conditions in such studies as those of Bailey et al. and Locock, causing a generation of students and general readers in the United Kingdom, at least, to remain under the impression that the reality of archaeological dowsing had been all but confirmed by science.

Acknowledgments

I am grateful for the permission from Intercept Ltd, publishers of *Dowsing and Church Archaeology*, to use figures from the book. I would also like to express my thanks to Kenneth Feder of Central Connecticut State University, who supplied me with most of the materials relevant to the U.S. public and suggested several improvements to this article. Any remaining errors and omissions are of course my own.

Notes

1. For example, one such unreported test was recently conducted on behalf of a popular U.K. television series that deals with "paranormal" phenomena. The test involved dowsing over an undisputed Roman villa whose plan had been determined by geophysical techniques. The dowsing was carried out "blind," although the dowsers were informed as to the likely nature of the targets. When no correlation was found, it was revealed that this result was of no interest to the viewing public (C. Gaffney, pers. comm.).

2. This ability to detect imprints is reminiscent of the above-ground "electro-magnetic photo field" detected at one time by Karen Hunt in her dowsing surveys of vanished buildings (see Plummer 1991).

3. And given its importance in preserving and passing on knowledge about the past, one might add oral history to this list.

4. An important property of the archaeological record not often estimated at its correct value by nonarchaeologists is its highly structured nature. Archaeological sites are distributed nonrandomly in the landscape and features are distributed nonrandomly in the site. This predictability makes testing in real-world situations very difficult because an unknown proportion of "hits" may result from general knowledge of the type of site and feature that may be expected to occur in the test area. The flip side of this is the profusion of individual archaeological features found at many sites, each of which could serve as the object of an unspecified dowsing "prediction." Neither can be controlled unless very specific, or better yet, artificial, test conditions are selected.

References

- Archaeological Data Service. Forthcoming. *Guide to Good Practice in Air Photography and Remote Sensing Data Handling*. York: Archaeological Data Service.
- Aitken, M. J. 1959. Test for correlation between dowsing response and magnetic disturbance. *Archaeometry* 2:58–9.
- Bailey, R. N., E. Cambridge, and H. D. Briggs. 1988. *Dowsing and Church Archaeology*. Wimborne: Intercept.
- Clark, A. 1996. *Seeing Beneath the Soil: Prospecting Methods in Archaeology*. 2nd ed. London: Batsford.
- Clark, K. 1996. <http://avebury.arch.soton.ac.uk/CourseNotes/Yr3HandBk.html>. Southampton Archaeology—Student Handbook—3rd Year Students, *Geophysical Survey Practical*.
- Cole, J. R. 1980. Cult archaeology and unscientific method and theory. In M. B. Schiffer (ed.), *Advances in Archaeological Method and Theory* 3:1–33.
- El-Baz, F. 1997. Space age archaeology. *Scientific American* 277 (2):40–45.
- Feder, K. L. 1984. Irrationality and popular archaeology. *American Antiquity* 49 (3):525–541.
- Gaffney, C., J. Gater, and S. Ovenden. 1991. *The Use of Geophysical Techniques in Archaeological Evaluations*. IFA Technical Paper 9. Birmingham: Institute of Field Archaeologists.
- Graves, T. (ed.) 1980. *Dowsing and Archaeology*. Wellingborough: Turnstone Books. Reviewed in *Antiquity* 58:231–2.
- Greene, K.T. 1983. *Archaeology: an Introduction*. London: Batsford.
- Hancock, P.A. 1998. Dowsing the Rollrights. *SKEPTICAL INQUIRER* 22 (1): 32–37.
- König, R., J. Moll, and A. Sarma. 1996. The Kassel dowsing test. *Swift* 1(1):3–8.
- Locock, M. 1995. The Effectiveness of Dowsing as a Method of Determining the Nature and Location of Buried Features on Historic Garden Sites. *Archaeological Prospection* 2 (1995):15–18.
- Noël Hume, I. 1969. *Historical Archaeology*. New York: Knopf.
- Plummer, M. 1991. Locating invisible buildings. *SKEPTICAL INQUIRER* 15(4):386–397.
- Rahtz, P. 1985. *Invitation to Archaeology*. Oxford University Press.
- . 1988. Review of Bailey et al., *Dowsing and Church Archaeology*. *Antiquity* 62:808–9.
- Randi, J. 1979. A controlled test of dowsing abilities. *SKEPTICAL INQUIRER* 4(1):16–20.
- Van Leusen, P.M. 1996. <http://www.let.rug.nl/arge/Themes/fringe.html>. Martijn van Leusen's Fringe Archaeology page.
- Weymouth, J.W. 1986. Geophysical methods of archaeological surveying. In Schiffer, M. B. (ed.), *Advances in Archaeological Method and Theory* 9:311–395. Orlando: Academic Press.
- Wilcock, J. n.d. <http://zenon.inria.fr:8003/agos/sis/dowsing/dowsdean.html>. *The use of dowsing for the location of caves, with some results from the first Royal Forest of Dean Caving Symposium, June 1994*.
- Williamson, T. 1987. A sense of direction for dowsers? *New Scientist* 113 (19 March 1987):40–43. □