Dowsing Experiments

by

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Experiments organized by the British Army and Ministry of Defence suggest that results obtained by dowsing are no more reliable than a series of guesses.

HISTORICALLY the practice of dowsing goes back many centuries. The most ancient reference is a Chinese engraving of AD 147 showing the Emperor Yu holding a forked divining rod. In the sixteenth century divining rods were used by miners searching for metal ores although this practice was condemned by Luther. By the seventeenth century various theories to explain the phenomena were put forward by several writers but with a lamentable lack of evidence of any systematic trials to substantiate the theories.

In the present century the subject has received some publicity and there are national societies of dowsers. From time to time dowsing is mentioned in the press[1] and recently trials were featured in a television programme (Margins of the Mind on Granada TV, in May 1968). Many people claim the ability to locate water, metals, stoneware, archaeological remains and other buried objects by dowsing. Some go so far as to claim the location of these objects by dowsing over a map of the area without the necessity of going over the ground.

Three types of apparatus are commonly used: (1) forked rods; (2) a pair of L shaped rods, and (3) a pendulum or plumb line. When one considers these three methods and the wide variety of objects which it is claimed can be found by dowsing, it is clear that to discover a satisfactory scientific or physiological explanation is a formidable task. Some writers claim that the subject is not susceptible to scientific analysis but belongs to the realm of art, appreciation and subjective judgments.

Before seeking explanations, it is necessary to substantiate the claims. For this purpose, a series of trials were devised at the Military Engineering Experimental Establishment (MEXE) of the Ministry of Defence, to test the validity of dowsing in a controlled series of experiments. These covered map dowsing and *in situ* dowsing for buried mines. Later tests were carried out for water divining by the Royal School of Military Engineering (RSME). Some additional trials were devised to test theories put forward.

Map Dowsing

An accurate survey was made of one of MEXE's outstations and a map at a scale of 1/2,500 was prepared. The area covered 384 acres and contained 6.7 miles of roads and tracks. To make the trial manageable twenty inert mines were buried only in the roads and tracks.

The map plus a sample mine was sent to experimenter *A* because it was reasonable to suppose he should know what he was looking for. He was told that an unspecified number of these mines were buried only in the roads and tracks and that any of his marks would be assumed to cover the full width of the road and a strip 10 feet wide. This corresponds to an error of about ±0.025 inches on the map.

Experimenter *A* asked for time and practice. His first attempt gave twenty-seven mines and none of them nearer than 80 feet. He then asked for more sample mines to practise on, and that he should be given the position of two of the buried mines, and further that a short stretch of road containing some mines should be indicated. This was done and a marked portion on the map, 3,400 feet long containing five mines, was selected. His results gave eight mines in this stretch with the nearest mark 20 feet from a mine. In spite of these discouraging results he suggested a more limited trial. A plan of a figure of eight track at a scale of 1/480 was sent to him with a short stretch 300 feet long indicated, in which was buried a row of five mines. This map was used by experimenter *A* and four others, with the result shown in Table 1.

Table 1 Achievements on Figure of Eight Track

Experimenter	Distance mark to mine (feet)
A	149
B	159
C	150
D	102
E	84

A mark midway could not have been more than 150 feet from any possible position.

Experimenter *F* was given the original map in the same conditions. He asked for a sample of the inert mine filling (sand and pitch) which he was given. His first trial gave twenty-six mines, the nearest mark being 60 feet from a mine. He then suggested that the filling was too similar to the surrounding soil and asked to try with something radically different. He therefore sent a bottle of homeopathic medicine and this was buried in one of the roads. He failed to locate this on his second trial.

Experimenter *G* was also given the map and the same conditions, but was told that there were fewer than fifty mines. His result gave fifty-three mines and the nearest was 40 feet from an actual mine.

During these trials a limited guessing exercise was carried out using the staff at MEXE. Fifty members were asked to guess the number and locations of mines in the 3,400 feet stretch of road. Eighteen guessed the correct number and one of these was within 1 foot of a mine.

It is easy to show that none of the results are better than pure chance. Taking *A*'s first results, his nearest mark is within 80 feet of a mine. The whole 6.7 miles can be thought of as units 160 feet long, that is mine ±80 feet. There are therefore 221 such units and with twenty mines and twenty-seven marks on the dowsers' map one would expect $20 \times 27/221$ or about 2.5 answers within 80 feet. Only one was achieved, a below chance result due to the grouping of his marks in a few areas. Similar calculations for other dowsers give similar results.

To sum up on map dowsing, the results from all the trials are really failures and there is no evidence that this is a practical method for locating mines. Most experimenters claim that their marks are either "spot on" or else failures. None of the experimenters achieved better results than the guessing exercise. It may be said that because only seven dowsers have been tested, the results are too few to disprove the claims.

In Situ Dowsing

In this test several mines were buried in a grid pattern and experimenters were asked to dowse over the places where mines were buried and over others where they were not. Using χ^2 tests it is possible to determine whether the dowsers are performing better than chance.

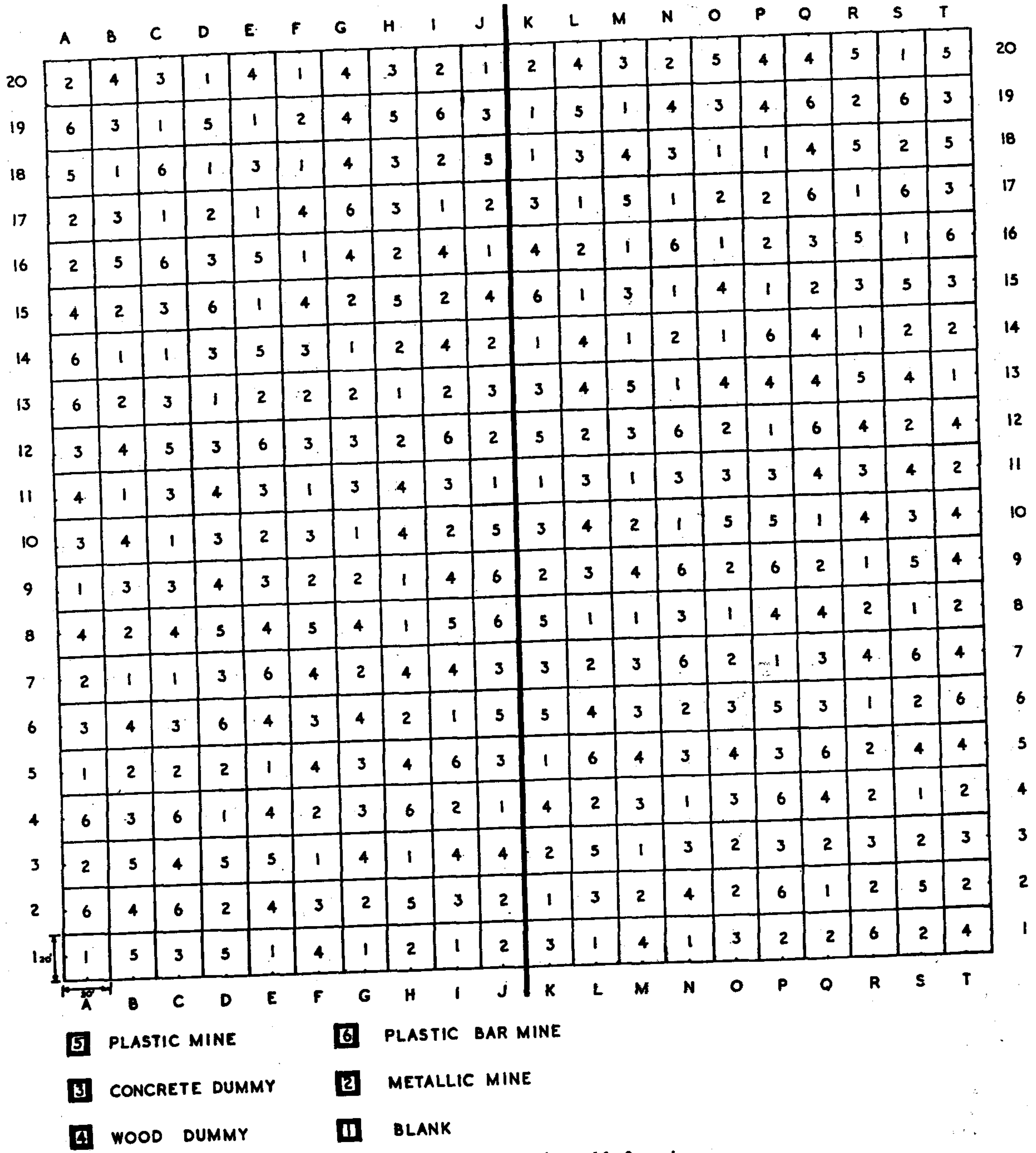
It became clear that the test could also be used to widen the inquiry and determine the dowsers' ability to distinguish between different types of buried objects. Five classes were established: M, metallic mine; P, plastic mine; C, concrete block; W, wooden block; B, blank or nothing. The concrete and wooden blocks were the same size and shape as the metallic mines.

Next a decision was made on the spacing and numbers of these objects. It was felt that 20 foot centres would be far enough apart to eradicate the "influence" of one object on another and all the dowsers agreed with this condition. The number of objects determines the significance level and power function of the experiment. Because the number of dowsers was not expected to be large a significance level of 1% was chosen. This means that there is a 1% chance of falsely detecting an association. The power function considers the different analyses of the results and the smallest association, say, between metal and plastic mines, must have enough figures in it for detectable differences. On this basis the total sample size was fixed at 400, that is, five groups of eighty of each class.

An area of land consisting of heath and heather was marked out and half of it was cleared and raked level. Each half had 200 squares and the objects were buried in a random pattern as shown in Fig. 1. Holes were dug at the centres of every square and different gangs of men buried each class of object so that no one could know the localities of all 400. None of these men took any subsequent part in the trials nor were they present on the site during trials. The only master location plan was locked in a safe throughout the experiment.

Response score cards were provided for all dowsers, who were not told of the wooden and concrete objects but were shown the mines. They were asked to dowse in front of small wooden pegs carrying the square identity and to record mine, plastic mine or nothing. Neither of the two people who supervised the laying took any part or were anywhere near the site. The number of each class of object was fixed at forty each in the natural and in the raked ground, which gives a response table for each dowser. A typical set of responses is shown in Table 2.

Twenty-two people volunteered to try their powers. Nearly all were firmly convinced they could do it. One person, at his own request, asked to repeat the trial because he felt (subjectively) that he had not done very well at his first try. One other was asked to repeat the trial because his score card had ambiguous markings.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	
20	2	4	3	1	4	1	4	3	2	1	2	4	3	2	5	4	4	5	1	5	20
19	6	3	1	5	1	2	4	5	6	3	1	5	1	4	3	4	6	2	6	3	19
18	5	1	6	1	3	1	4	3	2	5	1	3	4	3	1	1	4	5	2	5	18
17	2	3	1	2	1	4	6	3	1	2	3	1	5	1	2	2	6	1	6	3	17
16	2	5	6	3	5	1	4	2	4	1	4	2	1	6	1	2	3	5	1	6	16
15	4	2	3	6	1	4	2	5	2	4	6	1	3	1	4	1	2	3	5	3	15
14	6	1	1	3	5	3	1	2	4	2	1	4	1	2	1	6	4	1	2	2	14
13	6	2	3	1	2	2	2	1	2	3	3	4	5	1	4	4	4	5	4	1	13
12	3	4	5	3	6	3	3	2	6	2	5	2	3	6	2	1	6	4	2	4	12
11	4	1	3	4	3	1	3	4	3	1	1	3	1	3	3	3	4	3	4	2	11
10	3	4	1	3	2	3	1	4	2	5	3	4	2	1	5	5	1	4	3	4	10
9	1	3	3	4	3	2	2	1	4	6	2	3	4	6	2	6	2	1	5	4	9
8	4	2	4	5	4	5	4	1	5	6	5	1	1	3	1	4	4	2	1	2	8
7	2	1	1	3	6	4	2	4	4	3	3	2	3	6	2	1	3	4	6	4	7
6	3	4	3	6	4	3	4	2	1	5	5	4	3	2	3	5	3	1	2	6	6
5	1	2	2	2	1	4	3	4	6	3	1	6	4	3	4	3	6	2	4	4	5
4	6	3	6	1	4	2	3	6	2	1	4	2	3	1	3	6	4	2	1	2	4
3	2	5	4	5	5	1	4	1	4	4	2	5	1	3	2	3	2	3	2	3	3
2	6	4	6	2	4	3	2	5	3	2	1	3	2	4	2	6	1	2	5	2	2
1	1	5	3	5	1	4	1	2	1	2	3	1	4	1	3	2	2	6	2	4	1
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	

5 PLASTIC MINE	6 PLASTIC BAR MINE
3 CONCRETE DUMMY	2 METALLIC MINE
4 WOOD DUMMY	1 BLANK

Fig. 1 Random number table for mines.

Table 2 Response Table

Response	B	M	C	W	P	Totals
M	8	7	8	11	7	41
P	21	26	24	22	26	119
B	11	7	8	7	7	40
	40	40	40	40	40	200

The second row shows the number of times the dowser said metallic mine and the columns indicate how many of these responses fell on the objects B, M, C, W or P. The only correct score for line 1 is under column M, for line 2 under column P and so on.

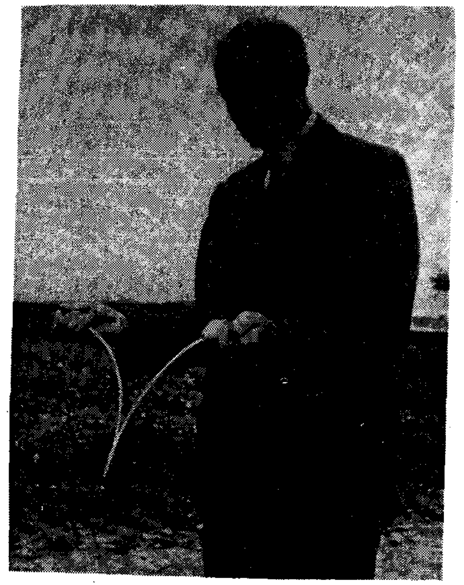


Fig. 2 Dowsing with forked rods.

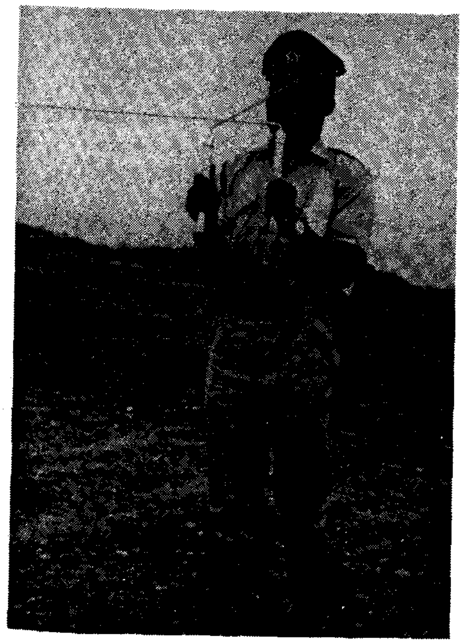


Fig. 3 Dowsing with two L shaped rods.

Two of the methods used are shown in Figs. 2 and 3. Dowsing rods were of many varieties including wood or nylon and each dowser was free to use whatever method he chose. One dowser used a plumb bob.

The responses can be analysed in a great many ways. For the purpose of these trials they were grouped as follows: (*a*) total response in a 2 by 3 by 5 table for raked and natural ground; (*b*) response mine versus not mine, that is (M+P) versus (B+C+W) 2×2 table; (*c*) response object versus blank, that is (M+P+C+W) versus B 2×2 table; (*d*) response mine versus blank (M+P) versus B 2×2 table; (*e*) $\Sigma\chi^2$ for *a*, *b*, *c* and *d* for each experimenter; (*f*) $\Sigma\chi^2$ for all experimenters.

While this analysis was being made it was clear that the simple mathematical treatment did not reveal the whole truth. Thus in a simple 2×2 table, for example (M+P) versus (B+C+W), there is one degree of freedom. Thus if we assume *r* "yes" responses we have Table 3.

Table 3 *Responses after Mathematical Treatment*

Response	(M+P)	(B+C+W)	Total
Yes	$80-h$	$h+r-80$	r
No	h	$200-r-h$	$200-r$
	80	120	200

Only one further figure, *h*, is needed to complete the table. The χ^2 test does not distinguish between a good and a bad result. Thus if it is assumed that $r=100$ (reasonable average) and $h=20$ or 60, then $\chi^2=33.3$ each time. The second result is much worse than the first because the dowser has only located twenty mines out of eighty, whereas in the first result he located sixty. Thus the χ^2 tests do not distinguish between good and bad dowsers and to overcome this objection the following method was devised. Clearly the dowser who responded "yes" to every square would find all the mines, but at a cost of maximum effort in digging up every square. The dowser who responds "yes" at all the B+C+W places would achieve total failure but with far less effort.

There are thus two aspects to consider—effort and hazard. Effort is the number of squares to be dug up, that is, the number of "yes" responses, and hazard is the number of mines not discovered. This leads to a two-dimensional plot of effort against hazard (Fig. 4).

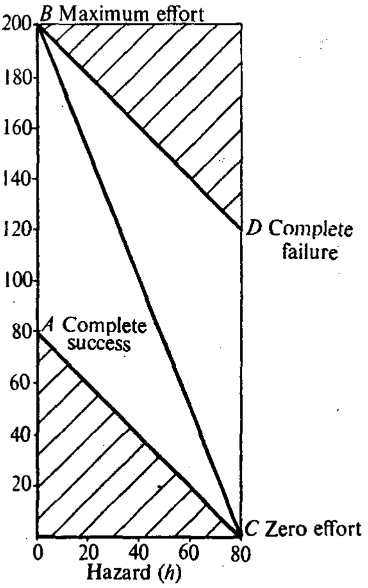


Fig. 4 Effort and hazard.

At the point 80, 0 is complete success; at 200, 0 is maximum effort and all mines found; at 120, 80 is complete failure and no mines are found; at 0, 80 is zero effort and no mines are found. The results all lie within the parallels given and pure chance results lie on the diagonal line as shown. About this diagonal line probability points can be calculated such that the probability of a score mark being beyond the point is (1 — confidence level). Curves for 5%, 1% and 0.1% are shown. The further the score marks are from the diagonal the better is the performance of the dowser, and of course the marks must be tending towards point *A*.

Table 4 Mines Missed (Hazard), Holes Dug (Effort)

Experimenter	Raked Mines missed (*h*)	Raked Holes dug (*r*)	Natural Mines missed (*h*)	Natural Holes dug (*r*)	Total Mines missed (*h*)	Total Holes dug (*r*)
1	—	—	33	126	—	—
2	22	136	14	160	36	296
3	75	20	67	22	142	42
4	—	—	23	139	—	—
5	33	104	65	51	98	155
6	50	64	46	53	96	117
7	49	70	61	43	110	113
8	46	79	31	111	77	190
9	7	158	6	174	13	332
10	12	177	4	189	16	366
11	36	100	53	73	89	173
12	23	121	—	—	—	—
13	27	113	34	108	61	221
14	21	136	42	102	63	238
15*	—	—	12	12	—	—
16	46	96	—	—	—	—
17	22	149	—	—	—	—
18	37	100	—	—	—	—
19	24	151	21	144	45	295
20	52	64	—	—	—	—
21*	—	—	27	37		
22*	—	—	11	36		
Mines present	80		80		160	

* Note that in these cases only part of the course was covered, so these results are not plotted in Figs. 5 and 6.

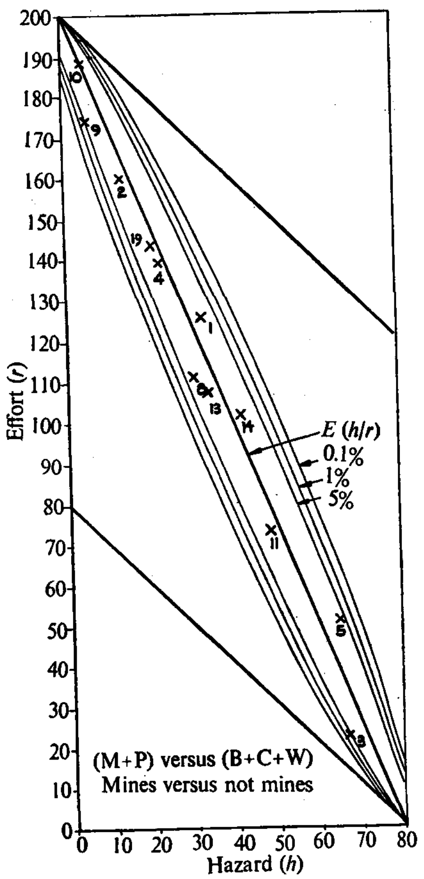


Fig. 5 Hazard and effort, natural ground.

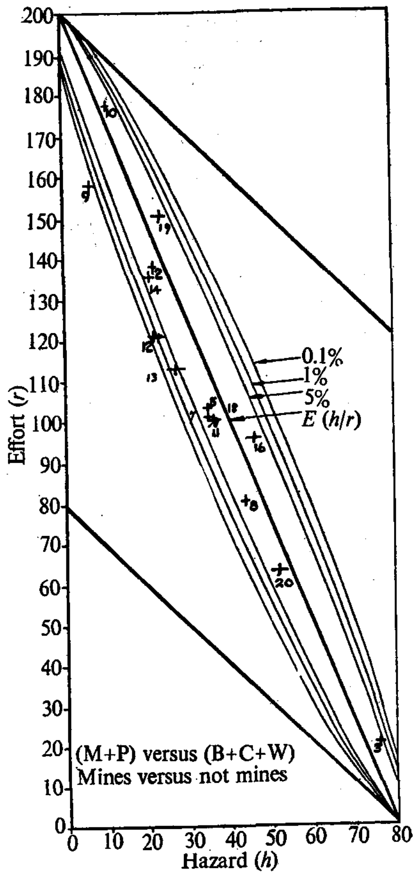


Fig. 6 Hazard and effort, raked ground.

Table 4 shows all the results for the twenty-two experimenters and these are plotted on Fig. 5 for the natural ground and on Fig. 6 for the raked. On the whole it is clear that most of the plotted marks are very close to the diagonal line of pure chance. Various other analyses were carried out but in no cases were the results good enough to excite interest. The best dowser was No. 9 on raked ground whose result was significant at the 1% level. This was, however, only achieved with a very high effort in digging many holes not containing mines. The results reveal a detectable difference between dowsing over raked and natural ground, which suggests that visual evidence in the raked ground helps the dowser. The effect of a few telltale signs would be to slide the diagonal line of Fig. 4 to the left because hazard and effort are both reduced by the number of such signs. The plotted marks then fall on the revised chance level diagonal. If the dowsers had to search for mines instead of trying over selected points it seems unlikely that they would have been more successful.

Water Dowsing

In the search for water, dowsing is more familiar than in seeking for metals or archaeological remains. In general, dowsers claim to find moving water—springs, pipes and so on—rather than static pools of underground water.

A test of the ability to detect flowing water was arranged with the cooperation of an experienced dowser. A 2 inch polythene pipe carried the water under a lawn and was controlled by a stopcock which the dowser could not see. He was asked to say whether or not the water was flowing in a series of twenty-five trials, the stopcock being on or off in a prearranged random sequence. He used a V shaped rod (rose cuttings) and walked across the line of the pipe to give his verdict. Two sequences were carried out giving fifty results.

The water was flowing in twenty-five of these. The dowser was correct in nine cases of water flowing and in sixteen of it not flowing, that is, he was correct in twenty-five out of fifty cases. This is entirely consistent with chance (guessing) and shows no evidence of being able to detect flowing water.

Further tests were carried out by RSME at Chatham. An experienced dowser undertook to train junior officers and judge their ability as dowsers. He took each of them over an alleged subterraneous water flow when the student held one end of a forked rod and the dowser held the other. Students were then asked to dowse over what was alleged to be a second flow. Many officers were tested and 25% were judged to be highly sensitive. These tests were later found to be invalid because a boring at the first trial site found no water at all.

In an additional test, the 25 per cent of sensitive officers were asked to locate and estimate the depth and rate of flow of water within a given 12 yard square. The flow was known to be 80,000 gallons per hour through a 42 inch main 8 feet down. Forty-seven per cent were said to have "high" sensitivity and 20 per cent to have "nil" sensitivity and this cast doubts on their initial high grading.

Finally, the four most successful students were asked to dowse over an area 150 feet square containing several 6 inch water pipes, with flowing water about 4 feet down. The position was known but could not be seen on the ground. Eighty markers were put down at least 10 feet apart; sixteen of them were over pipes in an overall random pattern. The four students had to say which of the markers was over a pipe. An analysis of the results showed no significant difference for chance except for one student who differed by 5 per cent which might be attributed to an ability to dowse. The sample size is, however, rather small to derive valid results.

The result of all these trials was frankly disappointing, the students were inconsistent and the judgment of the experienced dowser proved to be faulty. There is no real evidence of any dowsing ability which could produce results better than chance or guessing.

Theories of Dowsing

Rocard claims that dowsers are sensitive to variations in the Earth's magnetic field[2]. In most places the field is sensibly constant and therefore not detectable. But by dowsing in an aeroplane one is moving so much faster that these variations can be detected. Thus dowsing from an overbridge with vehicles passing beneath will, in Rocard's opinion, produce a result.

Rocard describes measurement of electrical potential differences between buried electrodes, and associates these with electrical currents and hence magnetic fields. These are in turn related to the flows of water through gravel dikes and seepages into wells when pumping water. By fitting small, light permanent magnets to the crooks of the elbows he found that his dowsers lost their ability. He therefore concludes that the organ of sensitivity is in the elbow and not in the head or hand.

Very few scientific tests are described and then only in relation to artificial magnetic fields. A rectangular wire wound frame was set up to give a field between 0.3 and 10.0 mgauss at the body of the dowser as he walked past. A preliminary "weigh in" was allowed in which the dowser was told whether the current was on or off. In a series of five attempts after this 100% success was achieved. When the preliminary "weigh in" was omitted the result was pure chance in up to fifty trials.

Table 5 Test for Magnetic Effects

Test	Response	Current on	Current off	Total	
(*a*)	yes	8	4	12	
	no	5	8	13	$\chi^2 = 1.99$
		13	12	25	
(*b*)	yes	5	4	9	
	no	8	8	16	$\chi^2 = 0.07$
		13	12	25	
(*c*)	yes	4	6	10	
	no	9	6	15	$\chi^2 = 0.96$
		13	12	25	

This theory was tested at MEXE. Two coils were set up and an experienced dowser attempted to say whether the current was on or off. The field strength was 6.7 mOe 1 m from the plane of the coil. Three test runs of twenty-five each were carried out consisting of: (*a*) passing the coils placed in line 3 m apart; (*b*) passing between the coils 3 m apart with magnetic fields in line; (*c*) as for (*b*) but coils 1 m apart.

Results are summarized in Table 5. These results are no different from pure chance and show that this experienced dowser is not susceptible to magnetic effects.

During the MEXE trials it was suggested that the cause of the dowsers' signal was an alteration in the electrical properties of the skin, and an instrument was produced in which this difference could be measured. This consisted of two coils of wire protected by conducting rubber. The coils were loops wrapped round the hands so that they and the dowsing rods were held together. Screened leads connected the coils to a millivoltmeter arranged to read from −50 to +50. The loops had remarkable sensitivity, for by squeezing them almost any reading could be obtained. The inventor claimed the instrument measured capacitance or alternatively "radiaesthesia" which are unspecific waves of radiation.

The most successful dowser (No. 9) agreed to try the instrument over two rows of twenty squares. On the first row he was correct seven times, reading −50 to +40 when correct, and on the second row he was correct six times, reading −15 to −30 when correct and −5 to +50 when wrong. There was thus no correlation between instrument readings and correct or incorrect dowsing finds.

During the trials I carefully watched several dowsers at work (Figs. 2 and 3). With all methods quite small movements of the hand produce very large movements of the divining instrument. The problem with the common V rods is three dimensional and not easily apparent. Fig. 7 is an isometric sketch of the normal V rods. OX and OY are horizontal axes and the action of the dowsers' hands is to hold the rods in the position shown. This he does by first pulling them apart and then bending the ends by a torque about the vertical axes through A and B. Because the rods are small there is very little torque that can be resisted about the horizontal axes OX. If this is now treated as a structural instability problem it can be shown that, if the tip C is slightly displaced, instability will occur unless a considerable restoring torque can be applied about the XX axes. The rods will move violently and rapidly into the vertical plane.

The L shaped rods are held with the short leg vertical. Here again very little torque can be applied about the vertical

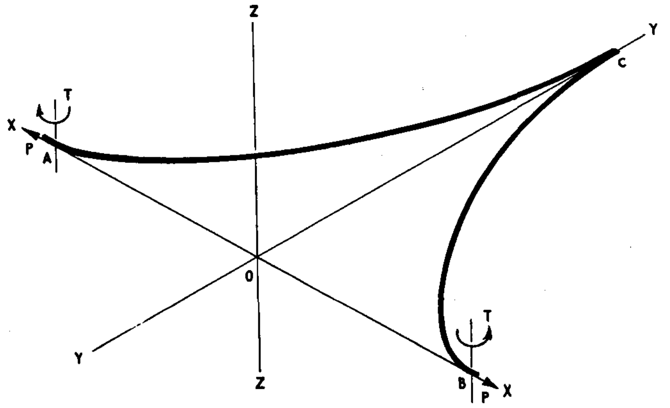


Fig. 7 Isometric sketch of V shaped rods.

axes except by gripping. In the instrument known as the "revealer" this grip is eliminated by mounting the short leg in ball bearings. If the short leg departs slightly from the vertical the rods are bound to swing. Because humans are right and left handed there is a tendency for the two hands to move in opposite senses either slightly inwards or slightly outwards. Possibly an inwards movement is easier and more natural so the rods move together.

In both cases, V or L rods, only extremely slight and imperceptible movements of the hands are required for quite large and spectacular movements of the divining rods because of the initial structurally unstable position chosen. This is most noticeable in the V rods and once they start to move they almost seem to become alive in the hands. I think that this is the explanation for a large part of the mystery surrounding dowsing.

Nevertheless, dowsers will continue to maintain their claims and to say that scientists dismiss their powers almost out of prejudice. The following arguments are often put forward[3]. (1) The "one good case" argument, that even one success is enough to prove dowsing. This is not statistically true. (2) The "test of time" argument that because dowsing has gone on for so long it must be true. This would also make witchcraft and astrology true. (3) The "core of truth" argument; that is, evidence from case after case. Compare old Chinese saying "if a thousand people believe a foolish thing, it is still a foolish thing". (4) The "testimonial" argument that some famous men (Nobel prize winners) have endorsed dowsing. Even more, however, have pronounced against it. (5) The "good and bad dowser" argument that dowsing gets a bad name because too many amateurs have dabbled in it. That was not true in the trials described here, for only those who claimed to be good dowsers and were recognized as such by other dowsers took part. (6) The "unfairness" and artificiality argument. Usually this is a *post hoc* argument. Great care was taken in all trials to ensure that dowsers agreed beforehand that the test was a fair one. (7) The "unfavourable atmosphere" argument that the dowser is surrounded by disbelievers or those who want him to fail. This is not true, and I would have been delighted to find even one dowser with significant results. (8) The "persecution" argument—look what happened to Galileo. Dowsing has nothing to do with Galileo and is valid or not irrespective of what happened to him or any other persecuted individual.

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[1] *Sci. J.* (November, 1967); *New York Times* (October 13, 1967); *Times* (December 11, 1967); *Sunday Express* (March 3, 1968); *Times* (March 5, 1968), *Engineering News Record* (May 2, 1968).

[2] Rocard, Y., *Le Signal de Sourcier* (Dunod, Paris).

[3] Voigt, E. Z., and Hyman, R., *Water Witching* (University of Chicago Press).

L-Asparaginase and Human Malignant Disease

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The enzyme L-asparaginase, which breaks down asparagine, causes certain tumours to regress. This property has been put to use in the treatment of malignant disease in man.

THE discovery that L-asparaginase has a useful place in the treatment of some forms of malignant disease in man was prompted by Kidd[1,2], who observed striking regressions after the injection of normal guinea-pig serum in mice and rats bearing certain transplanted lymphomas. Sera of other species, such as the horse, rabbit and human, were not effective. This information emerged from experiments in which guinea-pig serum was used as a source of complement. Although this serum enhanced the activity of antibody, there was strong tumour inhibition when it alone was used. The cytotoxic effect of guinea-pig serum *in vitro* against tumour cells must have been observed on several occasions by tumour immunologists during experiments with cytotoxic antibody, but the significance of the finding was not appreciated.

Broome[3-5] provided good evidence that L-asparaginase was responsible for the antilymphoma effects of guinea-pig serum after he had found an early paper by Clementi[6], who investigated the distribution of amino-acid degrading enzymes in the tissues of different animal species. Clementi observed that L-asparaginase was present in the liver and kidney of many species, but in the blood of only one of the animals that he studied—the guinea-pig. Sera lacking L-asparaginase have no antilymphoma properties. The tumour inhibitory agent and L-asparaginase seemed to be identical in several physical and chemical properties examined. The stability of the enzyme to changes of temperature and *p*H was found to parallel closely that of the antilymphoma agent. When guinea-pig serum proteins were separated by salt precipitation electrophoresis and chromatography on DEAE cellulose, antilymphoma activity was found only in fractions which contained L-asparaginase. Tumour cells can be selected for resistance to L-asparaginase *in vitro*, and these cells are also insensitive to the enzyme *in vivo* when transplanted to susceptible mice. Purification of L-asparaginase from other sources has shown the powerful tumour inhibitory effect of this enzyme. This finally established the role of L-asparaginase as a tumour inhibitory agent.

Source

L-Asparaginase has been found in the serum of guinea-pigs and related South American rodents[7,8], in New World monkeys, in chicken liver[9] and in some microorganisms such as *Escherichia coli* and *Erwinia carotovora*. The enzymes prepared from different sources do not all have the same properties and some are without effect on tumour growth. Mashburn and Wriston[10] obtained a potent preparation of asparaginase from *E. coli*. Such preparations have been shown to consist of two enzymes, only one of which is active against sensitive leukaemias[11-13]. One enzyme of low avidity has no tumour inhibitory action; the other is of high avidity and is a potent antitumour agent. The rate of clearance of the enzyme from the blood may be another factor determining its antitumour effect. The inactive enzyme has an extremely rapid clearance rate from serum. The inactivity of yeast asparaginase can be explained on this basis[14]. Whereas a considerable amount of guinea-pig serum