THE DIVINING ROD

I HAVE been much interested by Dr. C. A. Browne's article, "Observations upon the Use of the Divining Rod in Germany," appearing in SCIENCE for January 23. It recalls a somewhat similar experience of mine.

For many years a citizen of a neighboring town served this and other communities by using the divining rod to locate supplies of water. In order to settle a friendly argument regarding the existence of this mysterious power, a friend of mine persuaded the dowser to submit himself to a series of tests.

He used forked sticks of any kind of wood, but preferred pear or cherry. His procedure was to walk straight ahead across the chosen field holding the forked stick tilted a little forward, pointing not quite vertically upward. The forks were held in his hands as shown at A, not B, on page 84 of Dr. Browne's article. Presently the stick would bend forward and gradually point downward. Where it was vertical, there a water course existed, the dowser said. A stake was placed there. The process was repeated some distance away, the man walking along a line parallel to the first. Then the line of the water course was determined by walking from one stake to the other following the line where the divining rod continued to point downward. By the same process a second water course was located which intersected the first. The point of intersection was the place to dig the well. He performed this experiment on the college campus in the presence of my friend, myself and a few interested observers.

The usual variations were tried, such as having some one else hold one fork while the dowser held the other, with the usual success. The man was honest, and sincere in his belief that he possessed a mysterious power. He accounted for it by saying that he was very electrical.

Watching his hands during the tests, I soon saw that the bending of the rod was produced by the motion of his right hand. The forearm rotated, bringing the thumb upward and over toward the left hand. The left hand remained stationary. Apparently he was entirely unaware of the fact until it was shown him. When he allowed some one else to hold one fork of the rod, he had always retained the right-hand fork. We then had him retain the left hand fork with one of us holding the right hand one and the rod showed no tendency to bend over.

Other tests were then applied. He was blindfolded and led across the line he had established as showing the water course. Sometimes the divining rod bent over at that line. About as frequently it failed to do that, but bent over at some other place. We had him walk across and then along a blind ditch in which we knew water was flowing. The rod paid no attention to it.

His method of finding lost articles was to put a piece of the same substance at the tip of the rod and then walk about, holding the rod in the same manner as when searching for water. My friend loaned his silver watch for the test. It was concealed in the grass. The dowser stuck a silver quarter in a slit at the end of the rod and began the search. The results were what might be expected. My friend regained his watch later on, but not by that method.

Certain inferences seem well justified. The material of the rod is of no consequence. It serves as an indicator only. The wrist motion of the dowser, apparently involuntary, perhaps even unknown to him, was wholly responsible for the motion of the rod. Can the dowser have some peculiar sensibility which causes that involuntary muscular action when he is near water? In this case, the failure to respond when directly over the ditch where water was then running casts doubt upon that supposition.

The only possibility remaining, so far as I can see, is that one would find water by digging to a sufficient depth almost anywhere. It is quite possible that the percentage of successes in finding water by this method would be quite as large as that obtained by employing a dowser.

Such frequent occurrence of two underground streams of water, intersecting at approximately right angles and continuing as separate streams after intersection, hardly accords with our knowledge of the usual behavior of water. A method which consistently discovers such streams can not fail to arouse skepticism as to the validity of the claims made for it.

ERNEST C. BRYANT

MIDDLEBURY COLLEGE

THE USE OF THE DIVINING ROD IN GOLD PROSPECTING IN ALASKA

DR. C. A. BROWNE'S interesting article in Number 1882 of SCIENCE, "Observations upon the Use of the Divining Rod in Germany," has brought to my recollection an experience of my own, but in this country.

In 1913 I had a chance to visit Alaska, the purpose of my trip being to familiarize myself with the methods of gold mining as used in Alaska. With introduction cards to local people, given me by my friend, the late Dr. Alfred Brooks, I was able to do more in a few days than otherwise would have been possible in so many weeks. I also enjoyed a most friendly reception by every one with whom I happened to meet during my Alaskan trip. Owing to these facts I had been also able to learn something of the use of the divining rod in Alaska, the use of

which was not widely known, as I found out later in Washington.

My first visit was to the placers a few miles from Nome, operated by one of the most important companies, the exact name of which has slipped my memory. The work was carried on on a rather small scale, and in a few hours the manager of the company had shown me everything that was worth seeing. When we returned to his office, suddenly and to my great surprise and even embarrassment, he said: "Geology and geologists are all right, and they do their best, but in my hunt for gold pockets I have been chiefly dependent on this small instrument." Speaking so, he pulled out from the shelf in the corner of the room a fork-shaped branch of a tree in which I immediately recognized the divining rod of the simplest and most traditional form. Remembering our previous talk with this gentleman, the great respect which he had shown to Dr. Brooks and his collaborators and their geological work, I thought, at first, quite unwillingly, that the manager was trying to have some fun with the foreign geologist. However, I soon realized that he was quite serious. He told me about some tests made with his rod by unbelievers. They had placed a gold coin under the carpet, or pretended that they had, and invited him to locate this coin by means of his rod. If the coin really was under the carpet, the rod would immediately dive, thus showing the position of the coin more or less exactly. The manager was rather modest in his pretensions to find the exact point, but was quite positive that he could locate the coin within a circle of about five feet in diameter. During our talk he held the rod in the traditional way, and suddenly it dived. "I am quite sure," he said, "there is a gold vein under this house, but the trouble is that while by means of this instrument I can discover gold, I am unable to find out how rich the vein would be." Probably this consideration prevented him from tearing down the house to start mining at this particular point. As follows from Dr. Browne's article European operators would be, probably, more successful in this case.

I. P. TOLMACHOFF

CARNEGIE MUSEUM,
PITTSBURGH, PA.

A BANKED RACE-TRACK ILLUSION

WITH the consent of the writer I venture to send the following account of an old experience which I have recently extracted from my friend Mr. Gordon Pennington, a Cleveland engineer.

To keep my promise made this morning, I am going to give you a brief account of my experience on the Luna Park track.

This track, you may recall, was circular, a quarter mile in length, and banked sixty degrees, the banked portion curving gradually to horizontal at the inner edge of the track.

The motorcycles used were light and direct geared and could not be run under thirty-five or forty miles an hour.

When I went out to the track to become a motorcycle racer I had never been on a motorcycle before. On my first experience I rode around the inner edge of the track for several turns at the minimum speed the motorcycle could be held down to. As soon as I became used to this I opened up the throttle, increased my speed and, of course, had to climb up on the sixty degree portion of the track. As I climbed from the more horizontal to the steep portion of the track I was very conscious of the decreasing inclination of my body to the horizontal until, when I had reached the sixty degree section, I had the sensation that my body was almost horizontal (probably was inclined twenty degrees to the horizontal). I was very conscious that I was on my side. I was where I knew I ought to be. My perception was guided by my intellect, not by my internal sensations.

A few seconds after I had reached full speed I experienced the novel sensation I spoke to you about. Suddenly I and my motorcycle seemed to regain the vertical position and, of course, simultaneously the entire track and the field in the center of it, filled with people and automobiles, tilted up at a steep angle. I then found myself racing on a horizontal track (that is, laterally) and at the bottom of a tread mill which seemed to turn under me at just the right speed to keep me always at the bottom.

After my first experience this sensation of being vertical and the rest of the world inclined continued on all subsequent runs, and increased my sense of security on the track. In that first experience, however, when my point of view changed, I was for a few moments completely bewildered, and let my motorcycle travel clear up to the retaining board on the upper edge of the track and very nearly crashed. I suspect that a good proportion of the accidents which have occurred to beginners on these circular tracks have been the result of this moment of bewilderment which I assume that others have experienced in the same way that I did.

When I read this letter to a colleague in the laboratory, one of us said "Gestalt," and spoke of a period of physiological adaptation. The other said "Relativity or Frames of Space" and maintained that the adaptation was purely mental: "It is not like a case of the retina getting modified to function in a different light, or the skin at a different temperature. The otoliths press on the bottom of the rider's labyrinth, his head on his neck, his seat on the saddle, and the wheel itself on the track precisely as they would if the speed of the machine or the curvature of the track were reduced and he were riding practically upright along a flat path."