

AN INVESTIGATION OF A "MIND-READING" HORSE

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CASES of telepathic sensitivity in animals have been reported from time to time during the last quarter century, but on the whole have been granted little recognition from students of science. In some instances they have been so completely settled negatively in the minds of investigators in advance of any study that the investigations have frequently been superficially made or not even considered necessary for the formulation of a conclusion. This attitude of "credulous skepticism", however, is plainly unfair and unscientific, regardless of the nature of the case, and has never served to demonstrate either the truth or the error of such claims in any field. In other words, there are no *a priori* grounds for a conclusion on such a problem as telepathy, and the "hard and irreducible facts" should be resorted to.

One of the earliest cases claimed to be animal telepathy was that of the dog "Dodgerfield", owned by a Mr. Davies. This case was reported by Thorndike (11) in 1898. The dog could bring its owner the correct one out of four cards without any observed signal. The owner sat with closed eyes, hands concealed behind a newspaper, and silent except for the command, "Attention, Dodger! Bring it!" Thorndike, apparently in the absence of any decisive evidence either way, felt that it was a case of delicate association, the reading of cues in the owner's facial expression.

In 1904, Krall (5) took up the study of William von Osten's horse, Clever Hans, at Munich. This horse was said to possess not only telepathic powers but also independent thinking and calculating ability. Krall himself tried to train other horses and other animals to do similar feats, and was successful with a few horses, one of them blind. Many people, scientific and otherwise, observed these horses perform. Among them was a committee of academic scientists headed by Stumpf, of Berlin. Most of the observers agreed, with the committee, that unconscious signals from the investigator guided the horse. Some suspected that a stable man, whom they supposed was hidden about the place, gave the signals. Pfungst (6) claimed to be able to guide the horse by signals himself. A few observers, on the other hand, were convinced that the

horses exhibited telepathy and were of superior intelligence. The honesty and sincerity of Krall himself does not seem to have been questioned.

Reviews of the case from different viewpoints have been made by Richet,(7) Sudre,(10) Krall,(5) Hobhouse,(4) and others. Krall has continued his work, however, and has at present a laboratory which is said (Sudre) to be well equipped for the study of the psychology of horses and to which students are welcomed. He claims to have met successfully the criticisms made on his earlier work. He states that his horses have been able to give correctly numbers desired by persons present when there was no possibility of sensory cues being given the animal. The numbers were given by number of hoof-beats and letters by a number code. It would be highly desirable to have a reinvestigation of Krall's horses. All reports so far presented, including his own, leave much to be desired in completeness and decisiveness.

Bechterew, late professor of physiology, Leningrad,(1) reported in 1924 his investigations of two trained circus dogs. The dogs barked out numbers which the trainer, Durow, had in mind. Bechterew found that he himself could direct the dogs without Durow's knowledge. The animals could be "willed" into performing fairly complicated tasks such as going into the next room for a napkin from a table, etc. It was found that some mental following-up by the agent of the separate phases of a complex act was necessary. Successful tests were often carried out in the absence of the trainer, but the dog soon became uneasy and apparently preferred to have him present. Various precautions were taken. Screens were interposed, the agent, Bechterew, was blindfolded, assistants were used who did not know the task to be performed. Finally Bechterew stepped outside of the room just after the period of willing and the dog still succeeded. There seemed to be no physical obstruction capable of interfering with the transmission of thought, and no physical means of transmission discovered. This, if correct, is the situation called telepathy.

Yerkes (12) made some observations on a dog, Roger, thought by its owner to be telepathic. This dog could spell out words on lettered blocks if the owner had the word in mind, though she said nothing and gave no conscious move or signal. Yerkes compared the case to that of Clever Hans, at that time famous among psychologists as a study in supposed unconscious indication, and although he lacked specific evidential data for it, felt inclined to the same conclusion that Stumpf and others had arrived at in regard to the Eberfeld horses.

The following case is chosen from the extensive literature on telepathy in human beings because it is of particular interest in connection with the case herein reported. Brugmans, professor of Psychology, Groningen, (2) secured a subject who for a time yielded good results and later, for some reason, thought by Brugmans to be overstudied, lost his ability. This subject, Van Dam, was heavily blindfolded and seated at a table, a curtain being before him. He could reach out under the curtain and rest his hands on the table, on which was placed a checkered board with forty-eight squares. Brugmans sat in the darkened room above, looking down through a glass-covered hole in the floor, and was unable to see any part of the subject except his hand.

Seated in the room above, he "willed" Van Dam to move to a given square on the board, and the latter would tap twice on the board when he felt a "conviction" that he had the right square. Of 187 trials, in which chance would give four successes, 60 successes were obtained with this subject. Brugmans took certain physiological records on the percipient during the trial. Respiration, pulse, and psychogalvanic current records were obtained.

He showed that a state of passivity (self-induced in this case) was essential to success. This passive state was easily disturbed by noises, as is reported to be the case also with Professor Gilbert Murray's (8) telepathic sensitivity.

The subject did not have to be, and usually was not, attentive to what he was being influenced to do. This is in accord with the studies of Estabrooks, (3) who found diversion of attention from the tests was conducive to success.

The necessity for passivity in this work on telepathy recalls the pioneer work of Sir Wm. Barrett, as well as that of Pierre Janet, Charles Richet, and others, on telepathy under hypnosis. Stratton, (9) in the case of Rubini, found his subject "not alert" for signs or cues, and "dreamy" during the tests. In this case, while no evidence of signalling was forthcoming, Stratton inferred this to be the explanation.

This is not an attempt at a review of the literature on the subject of telepathy. Many of the outstanding contributions to the subject have not even been mentioned, since they do not bear especially on the case here reported.

The animal subject of the experiments herein described is a three-year-old filly, Lady, owned by Mrs. C. D. Fonda, of Richmond, Virginia. Lady is an ordinary looking colt, black with white face and feet, and she behaves in the yard like any normal horse of her age, except that she is more accustomed to the presence of stran-

gers. She is not especially well broken to handling as yet, although Mrs. Fonda succeeds pretty well in managing her.

Mrs. Fonda acquired the colt in the suckling stage, reared her on the bottle, and trained her to work with lettered and numbered blocks. She undertook to teach the animal to spell out small words and to make simple computations, having the colt touch the proper blocks with her nose. According to Mrs. Fonda's statement, she was much surprised at Lady's intelligence, her aptness in learning, and she soon discovered indications which convinced her that her pet was "reading her mind", that is, obeying her commands before she had expressed them.

According to the reports which led to our inquiry, the horse could make predictions, solve simple arithmetical problems, answer questions aptly and intelligently, and do all this without verbal command. All that was needed was that the question be written down and shown to Mrs. Fonda. In Mrs. Fonda's opinion, these accomplishments were due to a combination in the horse of unusual intelligence and the capacity for "mind reading".

The study of the telepathic claim naturally centers around the question of whether there is signalling from agent to percipient, in this case, from Mrs. Fonda to the horse. Such signalling may be deliberate and conscious, as in movements of whip or arm or head, or in word cues, throat sounds, and the like. Or it may be unintentional and unconscious, provided the agent is not on his guard, and consist in an inclination of the body, a suspension of breathing, a tension of the muscles, a direction of looking, etc.

A case for telepathy can be made only by the successful exclusion of signalling, thus eliminating the normal sensory channels. If mental influence is transferred under these conditions the phenomenon is named telepathy, with no claim implied as to the nature of the process. The common alternative hypothesis, hyperesthesia, is dependent on signals or cues, and therefore stands or falls with the evidence for a signalling system. We had to do, then, with a simple question: What is the evidence for and against signalling?

Our experiments were begun on December 3, 1927, and ended on January 15, 1928, covering in this period a total of six days. The tests were made at the residence of Mrs. Fonda, in a demonstration tent about 9 x 12 ft., which had a stall for the colt in one corner and a rude table near the center, toward which the animal faced. On this table were placed as needed cubical letter blocks (child's blocks) with the letter on one face only, or number plates each about 1½ inches wide, with one of the figures from 0 to 9 on each.

Mrs. Fonda usually stood by Lady's head on the left side, and all others stood across the table from the horse.

Mrs. Fonda readily accepted any suggestions we made and allowed us to follow our own schedule. We arranged the blocks or plates in any order we wished, and changed them frequently. We instituted the arrangement of the ten number plates in two rows of five: Mrs. Fonda had customarily had one row of ten. Sometimes the blocks or plates were only $1\frac{1}{2}$ inches apart; sometimes they were as much as eight inches.

We were not always able to progress smoothly toward our goal and had, in some cases, to repeat the same tests on different days in order to reach satisfaction on them. They are therefore not given chronologically. In general, our aim was to run the tests in series of five, ten, or fifteen. But in several cases there were changes made in the conditions during a series, a breakdown of control or a tightening of restrictions, and as a consequence we have some short series or fragments.

For convenience in comparing the results with what chance would give, we used ten blocks, cards, or number plates, with but few exceptions, which are noted. This gave a chance basis of $1/10$, or one success (C) in every ten tests. We made actual guessing tests with the numbers 0 to 9, in order to check this figure, and in 200 tests the average was 11 C's per 100, which is very near the mathematical prediction. In no series of ten were more than two correct guesses obtained. This confirms the mathematical prediction of one success in ten as a basis for chance. Where a second trial is allowed, $1/10 + 1/9$, or $19/90$, is the chance value. This is about one chance in five. Two C 2's therefore are about equal to one C.

Professor William McDougall (hereafter designated as M) was present and participated in the experiments on two days of the six, and Assistant Superintendent John F. Thomas, of the Detroit schools (T), on one other day. Others present were Mrs. C. D. Fonda (F), J. B. Rhine (R), and Louisa E. Rhine (LER). Mr. C. D. Fonda was present at some of the experiments, and was at the beginning suspected, as anyone would be, of being part of the system. But since he was present only a part of the time and then very inconspicuously, often not knowing what the "thought" was (see Group C), and since he seemed to have no more control over the horse than we ourselves, we leave him out of the account for the sake of brevity. LER recorded the data throughout, together with the conditions of the tests, at the time of occurrence.

EXPERIMENTAL**GROUP A****UNRESTRICTED CONDITIONS**

This group consists of observations made with F entirely unrestricted, and is given to show some of Lady's feats. In most of these cases F talked freely to the horse and used the whip occasionally when necessary to urge her to work. F sometimes caught Lady's halter and drew her back for a fresh start. In movements such as these, and in the words and inflections of her spoken commands, we naturally looked for evidence of a system of guidance.

- I. Ten number plates on table in one row (numbers from 0 to 9). R wrote a single figure on a pad and silently showed it to F only.
Tests 1-5. Numbers chosen: 3, 9, 9, 2, 4
Results: 4 correct, 1 correct on second trial.
- II. R asked Lady what time it was. All knew approximately. Time was 2:45. Lady touched 2, 3, 0.
- III. Ten number plates in two rows. M asked orally.
Tests 1-10. Problems: $4 + 3$, $4 + 4$, $6 + 3$, $4 - 2$, $1\frac{1}{2}$ of 60, of 160, of 100, cube root of 64, of 27, and of 1,728.
Results: 8 correct, 1 incorrect (no second trial given except where specified), and 1 untried. The cube root of 64 was the incorrect one, and that of 1,728 was not tried.
- IV. Twenty-six lettered blocks on table in two rows. M and R wrote words on pad and showed to F. She told Lady to "Spell the word", but did not say what it was.
Tests 1-5. Words: bed, kid, Mesopotamia, Carolina, Hindustan.
Results: All correct.
- V. Table as in IV. F asked questions. C here means a sensible reply.
 1. What is this gentleman's name? Rhine—C
 2. What have I in my hand? Whip—C
 3. What has Dr. McDougall on his head? Hat—C
 4. Can you spell boy? Boy—C
 5. How are you feeling? Good—C
 6. Don't you like the board? (Wooden screen up in front of her. She did not seem to like it.) Blind—C
 7. What makes you so bad? Fun—C
 8. Where does Mr. Thomas go from here? (He went to Detroit eventually, which F knew, but first to New York City, which F did not know.) Detroit—C
 - 9.*Where can I borrow some money? (Written on paper and handed to F. Not read aloud.) Bank
Which bank? Commerce
Which one? Richmond? Yes—C

- 10.*Where is ——? (Whereabouts of a wanderer) N. Y.
 State or city? State
 What city? Troy—C
- VI. Twenty picture blocks about $1\frac{1}{2}$ in. cubical, with figures of animals and other objects printed dimly thereon. F verbally ordered Lady to "Find a dog", etc. Lady, touching the requested block with her nose, located fifteen in all without an error.
 Blocks located camel, turkey, pony, buffalo, pony, sailboat, lion, parrot, eagle, camel, dog, rabbit, bull, sheep, and cat.
- VII. Set of ten index cards on the table, each with a peculiar figure drawn with crayon, designed to be unnameable at first sight. From a duplicate set R drew one at random and showed it to F, who had not seen these cards before, R having shown the set that day for the first time.
 Tests 1-5. All correct.

GROUP B

TRAINER RESTRICTED

In this group the freedom of F was gradually restricted in order to limit the possibility of signalling. F knew the number chosen. It was selected by M or R, usually from a duplicate set in his pocket, sometimes mentally. Plates were arranged in two rows of five each.

- VIII. Voice eliminated
 F silent. Otherwise unrestricted.
- a. R chose numbers.
 Tests 1-10. Numbers chosen. 2, 7, 4, 0, 2, 9, 6, 8, 3, 1.
 Results: 9 correct, 1 correct on second trial. (F spoke during tests 1 and 2.)
- b. Same as a, except that M gave oral direction to Lady.
 Tests 1-5. Sum of $2 + 4 + 7$, $3 + 5 + 4$, $5 + 9 + 7$, $6 + 8 + 9$, $7 + 8 + 9$.
 Result: All correct.
- IX. Body movements eliminated.
 F silent and motionless but free to watch the horse.
- a. M selected numbers and showed to F. M occasionally spoke to Lady.
 Tests 1-10. Numbers. 3, 8, 9, 5, 8, 8, 2, 4, 3, 5.
 Result: 9 correct, 1 correct on second trial.
- b. Same as a, except M absent R selected number. Showed to F only.

* Questions 9 and 10 are drawn from a "Visitor's Hour" at which R and LER were present. They are given as types to show Lady's characteristic type of response to questions asked her.

Tests 1-5. Numbers: 6, 8, 4, 0, 3.

Result: 4 correct, 1 correct on second trial.

- c. Ten lettered blocks were turned face down on table. They were blank on visible faces. A diagram of the arrangement was made on a pad. R indicated to F alone which block he chose, by pointing to the corresponding one on the pad. No one spoke during the tests.

Tests 1-5.

Result: All correct.

- d. Ten cards, those of experiment VII, with drawings of unnameable designs, were used instead of blocks. Choice was made by R from shuffled duplicate pack and shown to F alone. All silent

Tests 1-5: 5 different cards.

Result: All correct.

In c and d it is apparent that a system of signals involving the names of the objects or blocks to be touched was unnecessary and that the location alone was quite sufficient to guide the horse. This location or arrangement was of course our own, and not that of F.

X. Head and eye movements eliminated.

- a. F looked out of tent door, her back to table. She held whip. R watched F, and noted that she glanced back at Lady several times. F allowed to use words chosen by us, "Find the number, Lady". Lady required urging. R and F knew the number.

Tests 1-10. Numbers: 4, 6, 4, 0, 1, 7, 3, 1, 9, 4.

Result: 5 correct, 3 correct on second trial, 2 incorrect.

- b. F stared in a fixed direction during the test, turned so as to be visible only in profile to Lady's eye. LER watched her. F was silent, motionless (eyes, head and body), and held the whip at her side in the hand away from the horse. R wrote a figure on the pad and silently showed it to F only. F was allowed to give Lady directions only before the number was written down.

Tests 1-5. Numbers: 8, 7, 5, 8, 1.

Result: 4 correct, 1 correct on second trial.

- c. F restrained as in b. R watched her. Ten blocks, blank except on faces turned down, were used. R indicated to F alone the block chosen by pointing to the corresponding one on a diagram drawn on a pad. LER called results.

Tests 1-8: 7 different positions in 8 tests.

Result: All correct.

During the first three tests F glanced around momentarily about the time Lady touched. During the last five both she and R were motionless and silent. No one else knew the number.

- d. F with eyes closed to prevent Lady from seeing them.
Tests 1-5. Numbers: 8, 4, 3, 4, 6.
Result: 3 correct, 1 correct on second trial, 1 incorrect.
- e. F with closed eyes. R watched her. M mixed blocks, F and R not seeing them thereafter. Thus F and R alone knew the letter chosen and no one knew its location.
Tests 1-2. Letters T, F.
Result: 1 incorrect after three trials, 1 incorrect after two trials. The horse's movements lacked their usual definiteness. She touched or nodded sometimes at a block (wrong), sometimes between two of them, in an apparently random fashion.
This series shows that knowledge of the location of the chosen number by someone present is necessary, and that the knowledge of which letter it is is not enough. In series IX c and d it was shown that knowledge of the location alone was sufficient. These tests suggest, therefore, that the horse does not know the letters and that superior intelligence is not a factor.
- f. Eyes of all who knew controlled.
Only F and R knew the number chosen. Both knew its location. F's eyes were closed and her fingers held over them. She held whip but used it only with unopened eyes when Lady needed urging. Her speech was limited to "Find the number, Lady". R looked out the tent door during tests. M called results.
Tests 1-7. Numbers: 8, 4, 3, 4, 1, 0, 4.
Result: 4 correct, 3 incorrect (tests 2-4).
- g. F blindfolded.
A woolen scarf, doubled, covered her face from the forehead to the tip of the nose. She was allowed to say, "Find, Lady", when necessary. R asked orally.
Tests 1-5. Problems: $\frac{1}{2}$ of 18, $\frac{1}{4}$ of 32, $\frac{1}{20}$ of 100, $\frac{1}{50}$ of 100, $\frac{1}{25}$ of 100.
Result: 4 correct, 1 incorrect.
- h. All agents under control.
F blindfolded, silent, and motionless. R looked away during tests. He gave the location by description only, speaking in low tones to F. Numbers were changed around so that F would not know the number at a given location.
Tests 1-5. Five different locations given, as "Last one in first row."
Result: All correct.
These results of oral tests might conceivably be due to superior intelligence. But it is evident from the general data so far presented that some unusual transfer of thought, whether by signalling or by telepathy, is involved. Either explanation is theoretically adequate to explain the results without the assumption of a superior intelligence. Moreover, certain tests, such

as X e, indicate that Lady does not act from knowledge of the letters and numbers but rather, as in IX c and d and later series show, from being somehow directed to a given location. We feel safe, therefore, in presenting these data, when taken with the general setting, as not being subject to the criticism of possible superior intelligence (see XVIII).

XI. Trainer gradually separated from horse.

We encountered difficulty in this attempt and had to foist the innovation on the horse as opportunity permitted, since she stopped working when she became aware of F's absence. This was natural and would doubtless have required considerable time to overcome. But the results indicate that it could be done.

a. LER between F and Lady.

F silent, motionless, eyes controlled. R and F knew.

Test 1. Number: 4.

Result: Correct.

b. R between F and Lady. F gradually withdrawing.

Fifteen lettered blocks used. T wrote letters on pad and showed to F and R.

Tests 1-3. Letters: B, C, O.

Result: 1 correct, 1 correct on second trial, 1 incorrect. (Trouble with the horse, she looked around for F.)

c. R with screen between F and Lady.

18 x 18 in. board held by R near Lady's head screened both F and himself from the horse. F said only, "Find the number, Lady".

Test 1. Number: 8.

Result: Correct on second trial.

d. F blindfolded and outside tent, out of sight. M asked orally. R stood by Lady. Both M and R with eyes controlled during tests.

Tests 1-2. Problems: $\frac{1}{2}$ of 68, $\frac{1}{2}$ of 86.

Result: 1 correct on second trial (gave 32 instead of 34 first), $\frac{1}{2}$ correct (gave 4 on last problem, then became aware of F's absence and ceased working).

e. The two series of tests with F away from Lady, in XIII b and c, belong here also.

Few as our data are on the point of separating Lady and F, they show that F's position by the horse's side is not essential except for the matter of controlling the colt and so facilitating the procedure.

XII. Screen interposed between horse and trainer.

a. A board 18 inches square was used. F held screen. She could see some of the number plates and the horse could probably see her feet and coat. F's remarks were limited to "Find the number, Lady".

- Test 1. Number: 4.
Result: Correct.
- b. F and R both behind screen, which F held. R and F alone knew.
F's expressions limited as in a.
Tests 1-5. Letters: W, U, F, O, D.
Results: 4 correct, 1 incorrect.
- c. Same as b, except that R held board
Tests 1-5. Letters: N, K, K, G, T.
Result: 2 correct, 2 correct on second trial, 1 incorrect (This was correctly indicated by Lady's nod, but she did not actually touch it.)

The restrictions imposed in this group without preventing success served to eliminate certain possibilities of signalling. Audible cues could not have operated with F silent and separated from Lady by one of us. Movements of the body or of eyes were ruled out by the successful series in which F as well as M and R were controlled and motionless. Even the most delicate cues, whether conscious signals from F or unconscious ones from R, were invisible when the board screen was interposed.

GROUP C

TRAINER ELIMINATED

In this group F was kept ignorant of the number chosen. She was eliminated thus as a factor in the process under investigation, yet was retained as an aid in controlling the colt and making her work for us.

XIII. F ignorant of number.

- a. M and R alone knew the number. Both stood at the end of the table, where unconscious signalling, if any, would be least effective.
Tests 1-5. Numbers: 1, 5, 9, 1, 6.
Results: 4 correct, 1 incorrect (Lady in this test went to correct number, but did not touch.)
- b. R alone knew the number and stood at Lady's head. He spoke and used whip when necessary. F stood behind R, at first close, then farther back toward the tent wall.
Tests 1-6. Numbers: 2, 3, 7, 4, 2, 3.
Result: 4 correct, 2 correct on second trial.
- c. F out of tent. T and R alone knew the letter. Fifteen blocks on table. This is a continuation of XI b.
Tests 1-3. Letters: K, Y, T.
Result: First one correct, second incorrect (Lady now aware of F's absence), third untried. Horse out of R's control.

XIV. F ignorant of number. Precautions against unconscious signalling.

- a. T and R alone knew number. Their eyes shaded by hats from F and Lady. Lady not well behaved in this series.

Tests 1-5. Numbers: 4, 0, 8, 6, 3.

Result: 1 correct, 2 correct on second trial, 2 incorrect.

- b. M and R alone knew M and sometimes R behind a screen which concealed head and shoulders but allowed a view of the table.

This screen consisted of two large boards arranged in front of table. The horse was disturbed by it.

Test 1. Number: 4. R at end of table.

Result: Correct.

Tests 2-5. Numbers. 9, 4, 7, 0. R behind screen with M.

Result: 1 correct, 3 incorrect.

Tests 6-10. Letters: S, F, V, D, W. R at end of table.

Result: 2 correct, 1 correct on second trial, 2 incorrect.

Tests 11-15. Letters F, F, T, S, Q. R behind screen with M.

Result: 1 correct, 4 incorrect.

When R was behind the screen, the first test was correct each time. The introduction of this screen seemed to distract the attention of the horse and there was not time to accustom her to it. Screening her view on the side, however, did not interfere in this degree, although it even more completely cut off her view of those who knew the number, and who supposedly could have been directing her (see XII a, b, and c). Also, as in the tests with F outside the tent, the first test under the new conditions was a success each time, and made four such cases in all.

These results, however, are above the probabilities for coincidence, which would allow two correct out of the total of nineteen trials, as against the five (one being double, of two figures) which we got. The failures might have been due to the distraction of the animal's attention and to F's inability to keep from guessing at the number herself and exerting a misleading influence upon the horse.

- c. R alone knew the block, which he chose mentally. He stood motionless except for his eyes, which were shaded by his hat from the vision of F and Lady. He was consciously non-communicative and held his head straight ahead throughout. His hands were clasped in front against the body in all tests. He limited his speech to "All right, Lady", after a correct trial, and "No, Lady", after a failure

Tests 1-10. Seven different positions chosen.

Result: 5 correct, 1 correct on second trial, 4 incorrect.

- d. Same conditions, but the ten cards with the queer, unnameable drawings, were laid on the table in two rows of five each.

Tests 1-5. Five different positions chosen.

Result: 2 correct, 1 correct on second trial, 2 incorrect.

The results of c and d, with five correct and two correct on second trial above the chance basis, are conclusive. We are unable to conceive of any optic or acoustic cues of guidance value that were possible under these conditions, even though there was not, as in XII, a screen interposed.

Group C demonstrated that others could act as agents, instead of F. Though not so successful as F, they still succeeded well above the allowance for chance, even when under conscious control over unconscious indications. It will be seen that there is much left to be done yet in training the horse with a stationary screen, and with F out of the tent, etc. But we feel satisfied that we have circumvented these difficulties to an extent that gives us practically equivalent results. F ignorant of the number is equivalent to F absent, in effect, and the screen of XII was equal to that of XIV.

All the tests that were made are included in this report with the exception of certain preliminary and superfluous ones which have no point of interest or are useless duplications. These omissions number in all 65 tests, 40 of which were successes at first trial, 7 at second, and 18 were not correct on second trial. The complete data are summarized in the following table.

TABLE I.

Group	Total no. of tests	Successes 1st trial	Successes 2d trial	Failures	% of successes on first trial
1 Omitted	65	40	7	18	61 5
2. A—no control . . .	54	51	1	2	94 4
3. B—various restrictions	106	83	8	15	78.3
4. C—F not knowing	49	22	5	22	44 9
5 Control—guessing on 10 number blocks, number 0-9	200	22		178	11
6. Mathematical probabilities	10

One striking feature of the horse's behavior has not been mentioned, namely, her sleepy appearance when working well. Her head drooped, eyes nearly closed, nostrils relaxed, and she seemed quite inattentive. She moved no more than was necessary to touch the required block and often touched a nearer one in the next row. This passivity could be so deepened (by monotonous command, for instance) as to render her apparently motionless and almost asleep. Occasionally she would fall so deeply into this lethargy while working, that she simply remained motionless for a time. She could

be awakened by a sharp command or a touch of the whip and become quickly a normal active colt again.

Discussion

There are three general hypotheses for the explanation of Lady's behavior:

- a. Trained-in habits or response to a system of definite conscious signals from F.
- b. Trained-in habits of response to a system of definite unconsciously given cues from F and others.
- c. Telepathy, or the transmission of mental influence by a process that does not involve the known senses, but which does involve some special susceptibility or sense in the subject.

The conscious signal theory is disposed of by the Group C tests, in which F was eliminated, as well as by the Group B experiments in which she was so restricted as to make such a system seem an impossibility.

The theory of unconscious guidance seems equally untenable, in spite of its elasticity, since

- a. This theory assumes involuntary gestures, but the same psychologic assumption must grant also voluntary control over them. In XIV c and d and others this control was exerted.
- b. The horse's view of possible signalling organs was intercepted by the board screen in XII. Auditory cues were at the same time ruled out of XII c, in which R himself, as well as the board was between F and Lady.
- c. No signals were observed by anyone present, other than F's undisguised movements when unrestricted.
- d. The giving of cues under our conditions could hardly have been possible. To point out one of ten blocks a few inches apart without making a visible move or audible sound, and with eyes controlled, is hardly in itself a conceivable possibility. Besides this in the X c series, the agents were not even looking at the blocks during the trial.
- e. The colt's whole manner indicated indifference to signals. There was no sign of attention to the agents. She did not hover over all the blocks awaiting a signal, but as a rule made definite moves. Her passive state of body was one

least associated with alertness, whereas the reading of delicate, to us invisible, signals, would, if possible at all, require the animal's best attention.

There is left then, only the telepathic explanation, the transference of mental influence by an unknown process. Nothing was discovered that failed to accord with it, and no other hypothesis proposed seems tenable in view of the results. However, we are still devoted to the end of more and better evidence and are interested at this stage in obtaining, not so much credence, as assistance in securing more evidence.

The continuation of the research will be greatly facilitated by information regarding dogs, horses, or human beings who may possess telepathic ability. Even the so-called "thinking" or "calculating" animals may be of use. It is unfortunate that such animals are usually celebrities and their time must be purchased at high figures. Without special financial aid this is a real obstacle.

Supplementary Notes

During the interval between the completion of this report and its publication, some results were obtained that will be of interest to those who have read the report given above. These are briefly summarized below.

On April 11, 1928, we broke in upon Mrs. Fonda and Lady when preparations were being made by the Fondas to move for the summer. We were given an opportunity to experiment although it was obvious that the conditions were not favorable. Mrs. Fonda had not been well for some time and was distinctly nervous. She showed this conspicuously in her use of the whip, and her impatience with the horse. She had less control over Lady than usual, and at the beginning of the tests even used a halter strap to help her manage the colt. This was abandoned in all the tests recorded, however. As would be expected on a theory of telepathy, the horse did not work well and made many mistakes, even for Mrs. Fonda herself. She did not succeed at all without Mrs. F. knowing—did not even obtain the theoretical chance success of two correct out of eighteen tests given. It seemed probable that Mrs. F. was not calm and self-controlled enough on this occasion to keep her own mind blank, and the "guess" she made was more effective than our influence. Her influence upon the horse is characteristically stronger than ours, as might be expected.

When we allowed Mrs. F. to know the number but controlled her

by having her direct her eyes at a given point or by having her blindfolded and leaning against a post for stability, Lady succeeded in getting over 50 per cent correct as an average. Compared to the 10 per cent allowance for chance probabilities this is a fair margin, but is much lower than her previous records shown in the above report.

The most important advance in this series was an attempt to get results with Lady's left eye blindfolded. The blindfold consisted of heavy folded flannel cloth, and with it on Lady could not see the agents, Mrs. F. and J. B. R., without turning her head. Out of 11 tests, 4 were correct. Two of these successes were obtained with the agents not only invisible, but silent. The other two were qualified by Mrs. F. using the expression allowed by us, "Find, Lady". This is at least significant enough to be encouraging and promises better results when Lady becomes better accustomed to the conditions. The blindfold disturbed her and she tried to rub it off. The conditions should not be distracting for a fair test.

Another series on this occasion offers some light on the process, at least by elimination. Without any attempt at restrictions or control, Lady was asked by one of our party at what hotel we had stayed during the night. She spelled M-A-U-R-, but the correct word was "Savoy". Asked where we had eaten supper, she spelled D-U-R-H-A-M (our home, and a good guess), including two mistaken letters in the spelling. The correct answer was South Hill. In both cases, after we told Mrs. F. what the correct answer was, Lady gave it correctly and promptly. It seemed as if Mrs. F.'s "guess" was overwhelmingly stronger than our faint influence. When a comb was drawn from the pocket and held before the horse, so that Mrs. F. could not see it, with the question, "What is it?" Lady spelled C-A-R-D, and when told this was incorrect, P-E-N. But when the comb was shown to Mrs. F., C-O-M-B was given at once. From a duplicate set of blocks, five were chosen, one at a time, and each was held before the horse's face in a position which kept Mrs. F. from seeing the letter on it. Lady was asked to show which it was. In all five trials, she touched incorrect blocks. But in each case, after failure, the block was turned so that Mrs. F. could see the letter. Lady then got it correctly every time. These results appear to show that Lady does not have a "working knowledge" of the alphabet, with which most of her work is done, and that in some manner she is directed to the blocks by an external agency. Also, if the reader should still be holding to the theory of unconscious indications, it must puzzle him to find that in these series in which we stared at the block desired and

expected, and gave beyond doubt such indications as the average human does under such circumstances, we obtained no success until Mrs. F. knew the number. Whereas, in XIV, with careful precautions taken to prevent such indications and with Mrs. F. not knowing, we were successful.

On September 16, 1928, Mr. Kenneth McDougall succeeded in directing Lady with Mrs. F. ignorant of the choice. Cards with geometrical designs drawn on them were used. Mr. McDougall made his choice from a duplicate pack, concealed from Mrs. F. In order to avoid unconscious direction he kept his gaze fixed on the tip of Lady's nose during the tests. Out of 10 tests, 4 were correct, 1 correct on second trial, and 5 incorrect.

On the same occasion, Mrs. William McDougall was even more successful under similar conditions. She used numbers of two figures each, and wrote each one on a pad in a manner that concealed hand movement from Mrs. F. Mrs. McDougall too was careful not to allow her gaze to rest on the block to be touched. Out of 6 double numbers, or 12 figures, 8 were correct, 1 correct on second trial, and 3 incorrect.

These results, like those reported above, are very much too good to be disposed of as coincidental, while on the other hand they are far too poor to be the result of training. The fluctuations are too pronounced, varying as they do all the way from failure to perfection (with F knowing). The trained animal does not behave in this way. Telepathy experiments, where that process is operative, however, have shown this variability to be rather a general feature. Either the agent or the subject may vary greatly from time to time, and the results accordingly range from 0 per cent to 100 per cent in correctness.

To illustrate the possibility of detection and elimination of unconscious indications, we mention briefly the case of a Belgian shepherd dog which we investigated in July, 1928, with Dr. William McDougall, near Silver Lake, New Hampshire. The dog was reported to be able to give, by the number of barks, correct answers to such questions as, "How many ladies present?" "How many loads of hay did we get in to-day?" and, in some cases, to questions to which he could not have known the answer, no matter how intelligent he might be. In this case the behavior of the animal was relatively simple compared to that of Lady; the dog simply barked until a stimulus, from without or within, stopped him, while Lady moved directly to one of the 10 to 26 blocks, touched it with her nose, and then went to the next one.

We found the dog able to do as reported. But it was easily

observable that the owner, quite unconsciously, gave him some very definite cues when the proper stopping point was reached. He relaxed his facial muscles, changed the direction of his glance, moved his hands, and frequently turned his head and straightened his body. The dog ceased to bark when he got these signs. When after some difficulty the man was persuaded to avoid such indications, the dog kept on barking; and when he gave his commands through a crack of the door or from behind a closed door the dog barked, but with no success. The dog appeared to be able to count fingers, but when J. B. R. stood behind the owner and showed the animal a number of fingers, he failed in any case to get the correct number. Therefore, while we could not say with finality from the relatively brief investigation of this animal that there was no unusual mental process in operation, it was evident that these obvious unconscious cues were principally responsible, although there may have been more than the average dog's intelligence as a basis for his actions. It is plain from this case that unconscious indications constitute a real alternative hypothesis to telepathy, but that they can be consciously avoided on the one hand, and detected and prevented on the other, if they occur.

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