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ROBERT SILVERBERG

An unusual science-espionage story by

FRANK RILEY



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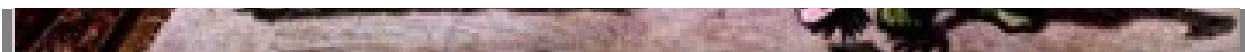
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*** START OF THE PROJECT GUTENBERG EBOOK LEARNING
THEORY ***

LEARNING THEORY

BY JAMES MC CONNELL

***Destiny's tricks can be pretty weird
sometimes. And this was one to be proud
of. A cosmic joke, a witch that could
make a nightmare seem tame!***

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I am writing this because I presume He wants me to. Otherwise He would not have left paper and pencil handy for me to use. And I put the word "He" in capitals because it seems the only thing to do. If I am dead and in hell, then this is only proper. However, if I am merely a captive somewhere, then surely a little flattery won't hurt matters.

As I sit here in this small room and think about it, I am impressed most of all by the suddenness of the whole thing. At one moment I was out walking in the woods near my suburban home. The next thing I knew, here I was in a small, featureless room, naked as a jaybird, with only my powers of rationalization to stand between me and insanity. When the "change" was made (whatever the change was), I was not conscious of so much as a momentary flicker between walking in the woods and being here in this room. Whoever is responsible for all of this is to be complimented—either He has developed an instantaneous anesthetic or He has solved the problem of instantaneous transportation of matter. I would prefer to think it the former, for the latter leads to too much anxiety.

As I recall, I was immersed in the problem of how to teach my class in beginning psychology some of the more abstruse points of Learning Theory when the transition came. How far away life at the University seems at the moment: I must be forgiven if now I am much more concerned about where I am and how to get out of here than about how freshmen can be cajoled into understanding Hull or Tolman.

Problem #1: Where am I? For an answer, I can only describe this room. It is about twenty feet square, some twelve feet high, with no windows, but with what might be a door in the middle of one of the walls. Everything is of a uniform gray color, and the walls and ceiling emit a fairly pleasant achromatic light. The walls themselves are of some hard material which might be metal since it feels slightly cool to the touch. The floor is of a softer, rubbery material that yields a little when I walk on it. Also, it has a rather "tingly" feel to it, suggesting that it may be in constant vibration. It is somewhat warmer than the walls, which is all to the good since it appears I must sleep on the floor.

The only furniture in the room consists of what might be a table and what passes for a chair. They are not quite that, but they can be made to serve this purpose. On the table I found the paper and the pencil. No, let me correct myself. What I call paper is a good deal rougher and thicker than I am used to, and what I call a pencil is nothing more than a thin round stick of graphite which I have sharpened by rubbing one end of it on the table.

And that is the sum of my surroundings. I wish I knew what He has done with my clothes. The suit was an old one, but I am worried about the walking boots. I was very fond of those boots—they were quite expensive and I would hate to lose them.

The problem still remains to be answered, however, as to just where in the hell I am—if not in hell itself!

Problem #2 is a knottier one—Why am I here? Were I subject to paranoid tendencies, I would doubtless come to the conclusion that my enemies had kidnapped me. Or perhaps that the Russians had taken such an interest in my research that they had spirited me away to some Siberian hideout and would soon appear to demand either cooperation or death. Sadly enough, I am too reality oriented. My research was highly interesting to me, and perhaps to a few other psychologists who like to dabble in esoteric problems of animal learning, but it was scarcely startling enough to warrant such attention as kidnapping.

So I am left as baffled as before. Where am I, and why?

And who is He?



I have decided to forego all attempts at keeping this diary according to "days" or "hours." Such units of time have no meaning in my present circumstances, for the light remains constant all the time I am awake. The human organism is not possessed of as neat an internal clock as some of the lower species. Far too many studies have shown that a human being who is isolated from all external stimulation soon loses his sense of time. So I will merely indicate breaks in the narrative and hope that He will understand that if He wasn't bright enough to leave me with my wristwatch, He couldn't expect me to

keep an accurate record.

Nothing much has happened. I have slept, been fed and watered, and have emptied my bladder and bowels. The food was waiting on the table when I awoke last time. I must say that He has little of the gourmet in Him. Protein balls are not my idea of a feast royal. However, they will serve to keep body and soul together (presuming, of course, that they *are* together at the moment). But I must object to my source of liquid refreshment. The meal made me very thirsty, and I was in the process of cursing Him and everybody else when I noticed a small nipple which had appeared in the wall while I was asleep. At first I thought that perhaps Freud was right after all, and that my libido had taken over control of my imagery. Experimentation convinced me, however, that the thing was real, and that it is my present source of water. If one sucks on the thing, it delivers a slightly cool and somewhat sweetish flow of liquid. But really, it's a most undignified procedure. It's bad enough to have to sit around all day in my birthday suit. But for a full professor to have to stand on his tip-toes and suck on an artificial nipple in order to obtain water is asking a little too much. I'd complain to the Management if only I knew to whom to complain!

Following eating and drinking, the call to nature became a little too strong to ignore. Now, I was adequately toilet-trained with indoor plumbing, and the absence of same is most annoying. However, there was nothing much to do but choose a corner of the room and make the best of a none too pleasant situation. (As a side-thought, I wonder if the choosing of a corner was in any way instinctive?). However, the upshot of the whole thing was my learning what is probably the purpose of the vibration of the floor. For the excreted material disappeared through the floor not too many minutes later. The process was a gradual one. Now I will be faced with all kinds of uncomfortable thoughts concerning what might possibly happen to me if I slept too long:

Perhaps this is to be expected, but I find myself becoming a little paranoid after all. In attempting to solve my Problem #2, why I am here, I have begun to wonder if perhaps some of my colleagues at the University are not using me as a subject in some kind of experiment. It would be just like McCleary to dream up some fantastic kind of "human-in-isolation" experiment and use me as a pilot observer. You would think that he'd have asked my permission first. However, perhaps it's important that the subject not know what's happening

to him. If so, I have one happy thought to console me. If McCleary is responsible for this, he'll have to take over the teaching of my classes for the time being. And how he hates teaching Learning Theory to freshmen:

You know, this place seems dreadfully quiet to me.



Suddenly I have solved two of my problems. I know both where I am and who He is. And I bless the day that I got interested in the perception of motion.

I should say to begin with that the air in this room seems to have more than the usual concentration of dust particles. This didn't seem particularly noteworthy until I noticed that most of them seemed to pile up along the floor against one wall in particular. For a while I was sure that this was due to the ventilation system—perhaps there was an out-going airduct there where this particular wall was joined to the floor. However, when I went over and put my hand to the floor there, I could feel no breeze whatsoever. Yet even as I held my hand along the dividing line between the wall and the floor, dust motes covered my hand with a thin coating. I tried this same experiment everywhere else in the room to no avail. This was the only spot where the phenomenon occurred, and it occurred along the entire length of this one wall.

But if ventilation was not responsible for the phenomenon, what was? All at once there popped into my mind some calculations I had made when the rocket boys had first proposed a manned satellite station. Engineers are notoriously naive when it comes to the performance of a human being in most situations, and I remembered that the problem of the perception of the satellite's rotation seemingly had been ignored by the slip-stick crowd. They had planned to rotate the doughnut-shaped satellite in order to substitute centrifugal force for the force of gravity. Thus the outer shell of the doughnut would appear to be "down" to anyone inside the thing. Apparently they had not realized that man is at least as sensitive to angular rotation as he is to variations in the pull of gravity. As I figured the problem then, if a man aboard the doughnut moved his head as much as three or four feet outwards from the center of the doughnut, he would have become fairly dizzy! Rather

annoying it would have been, too, to have been hit by a wave of nausea every time one sat down in a chair. Also, as I pondered the problem, it became apparent that dust particles and the like would probably show a tendency to move in a direction opposite to the direction of the rotation, and hence pile up against any wall or such that impeded their flight.

Using the behavior of the dust particles as a clue, I then climbed atop the table and leapt off. Sure enough, my head felt like a mule had kicked it by the time I landed on the floor. My hypothesis was confirmed.

So I am aboard a spaceship:

The thought is incredible, but in a strange way comforting. At least now I can postpone worrying about heaven and hell—and somehow I find the idea of being in a spaceship much more to the liking of a confirmed agnostic. I suppose I owe McCleary an apology—I should have known he would never have put himself in a position where he would have to teach freshmen all about learning:

And, of course, I know who "He" is. Or rather, I know who He *isn't*, which is something else again. Surely, though, I can no longer think of Him as being human. Whether I should be consoled at this or not, I have no way of telling.

I still have no notion of *why* I am here, however, nor why this alien chose to pick me of all people to pay a visit to His spaceship. What possible use could I be? Surely if He were interested in making contact with the human race, He would have spirited away a politician. After all, that's what politicians are for! Since there has been no effort made to communicate with me, however, I must reluctantly give up any cherished hopes that His purpose is that of making contact with *genus homo*.

Or perhaps He's a galactic scientist of some kind, a biologist of sorts, out gathering specimens. Now, that's a particularly nasty thought. What if He turned out to be a physiologist, interested in cutting me open eventually, to see what makes me tick? Will my innards be smeared over a glass slide for scores of youthful Hims to peer at under a microscope? Brrrr! I don't mind giving my life to Science, but I'd rather do it a little at a time.

If you don't mind, I think I'll go do a little repressing for a while.



Good God! I should have known it! Destiny will play her little tricks, and all jokes have their cosmic angles. He is a *psychologist*! Had I given it due consideration, I would have realized that whenever you come across a new species, you worry about behavior first, physiology second. So I have received the ultimate insult—or the ultimate compliment. I don't know which. I have become a specimen for an alien psychologist!

This thought first occurred to me when I awoke after my latest sleep (which was filled, I must admit, with most frightening dreams). It was immediately obvious that something about the room had changed. Almost at once I noticed that one of the walls now had a lever of some kind protruding from it, and to one side of the lever, a small hole in the wall with a container beneath the hole. I wandered over to the lever, inspected it a few moments, then accidentally depressed the thing. At once there came a loud clicking noise, and a protein ball popped out of the hole and fell into the container.

For just a moment a frown crossed my brow. This seemed somehow so strangely familiar. Then, all at once, I burst into wild laughter. The room had been changed into a gigantic Skinner Box! For years I had been studying animal learning by putting white rats in a Skinner Box and following the changes in the rats' behavior. The rats had to learn to press the lever in order to get a pellet of food, which was delivered to them through just such an apparatus as is now affixed to the wall of my cell. And now, after all of these years, and after all of the learning studies I had done, to find myself trapped like a rat in a Skinner Box! Perhaps this was hell after all, I told myself, and the Lord High Executioner's admonition to "let the punishment fit the crime" was being followed.

Frankly, this sudden turn of events has left me more than a little shaken.



I seem to be performing according to theory. It didn't take me long to discover that pressing the lever would give me food some of the time, while at other times all I got was the click and no protein ball. It appears that approximately every twelve hours the thing delivers me a random number of protein balls—the number has varied from five to fifteen so far. I never know ahead of time how many pellets—I mean protein balls—the apparatus will

deliver, and it spews them out intermittently. Sometimes I have to press the lever a dozen times or so before it will give me anything, while at other times it gives me one ball for each press. Since I don't have a watch on me, I am never quite sure when the twelve hours have passed, so I stomp over to the lever and press it every few minutes when I think it's getting close to time to be fed. Just like my rats always did. And since the pellets are small and I never get enough of them, occasionally I find myself banging away on the lever with all the compulsion of a stupid animal. But I missed the feeding time once and almost starved to death (so it seemed) before the lever delivered food the next time. About the only consolation to my wounded pride is that at this rate of starvation, I'll lose my bay window in short order.

At least He doesn't seem to be fattening me up for the kill. Or maybe he just likes lean meat!



I have been promoted. Apparently He in His infinite alien wisdom has decided that I'm intelligent enough to handle the Skinner-type apparatus, so I've been promoted to solving a maze. Can you picture the irony of the situation? All of the classic Learning Theory methodology is practically being thrown in my face. If only I could communicate with Him! I don't mind being subjected to tests nearly as much as I mind being underestimated. Why, I can solve puzzles hundreds of times more complex than what He's throwing at me. But how can I tell Him?





As it turns out, the maze is much like our standard T-mazes, and is not too difficult to learn. It's a rather long one, true, with some 23 choice points along the way. I spent the better part of half an hour wandering through the thing the first time I found myself in it. Surprisingly enough, I didn't realize the first time out what I was in, so I made no conscious attempt to memorize the correct turns. It wasn't until I reached the final turn and found food waiting for me that I recognized what I was expected to do. The next time through the maze my performance was a good deal better, and I was able to turn in a perfect performance in not too long a time. However, it does not do my ego any good to realize that my own white rats could have learned the maze a little sooner than I did.

My "home cage," so to speak, still has the Skinner apparatus in it, but the lever delivers food only occasionally now. I still give it a whirl now and again, but since I'm getting a fairly good supply of food at the end of the maze each time, I don't pay the lever much attention.

Now that I am very sure of what is happening to me, quite naturally my thoughts have turned to how I can get out of this situation. Mazes I can solve without too much difficulty, but how to escape apparently is beyond my intellectual capacity. But then, come to think of it, there was precious little chance for my own experimental animals to get out of my clutches. And assuming that I am unable to escape, what then? After He has finished putting me through as many paces as He wishes, where do we go from there? Will He treat me as I treated most of my non-human subjects—that is, will I get tossed into a jar containing chloroform? "Following the experiment, the animals were sacrificed," as we so euphemistically report in the scientific literature. This doesn't appeal to me much, as you can imagine. Or maybe if I seem particularly bright to Him, He may use me for breeding purposes, to establish a colony of His own. Now, that might have possibilities....

Oh, damn Freud anyhow!



And damn Him too! I had just gotten the maze well learned when He upped and changed things on me. I stumbled about like a bat in the sunlight for quite some time before I finally got to the goal box. I'm afraid my performance was pretty poor. What He did was just to reverse the whole maze so that it was a mirror image of what it used to be. Took me only two trials to discover the solution. Let Him figure that one out if He's so smart!



My performance on the maze reversal must have pleased Him, because now He's added a new complication. And again I suppose I could have predicted the next step if I had been thinking along the right direction. I woke up a few hours ago to find myself in a totally different room. There was nothing whatsoever in the room, but opposite me were two doors in the wall—one

door a pure white, the other jet black. Between me and the doors was a deep pit, filled with water. I didn't like the looks of the situation, for it occurred to me right away that He had devised a kind of jumping stand for me. I had to choose which of the doors was open and led to food. The other door would be locked. If I jumped at the wrong door, and found it locked, I'd fall in the water. I needed a bath, that was for sure, but I didn't relish getting it in this fashion.

While I stood there watching, I got the shock of my life. I meant it quite literally. The bastard had thought of everything. When I used to run rats on jumping stands, to overcome their reluctance to jump, I used to shock them. He's following exactly the same pattern. The floor in this room is wired but good. I howled and jumped about and showed all the usual anxiety behavior. It took me less than two seconds to come to my senses and make a flying leap at the white door, however.

You know something? That water is ice-cold!



I have now, by my own calculations, solved no fewer than 87 different problems on the jumping stand, and I'm getting sick and tired of it. Once I got angry and just pointed at the correct door—and got shocked for not going ahead and jumping. I shouted bloody murder, cursing Him at the top of my voice, telling Him if He didn't like my performance, He could damn well lump it. All He did, of course, was to increase the shock.

Frankly, I don't know how much longer I can put up with this. It's not that the work is difficult. If He were giving me half a chance to show my capabilities, I wouldn't mind it. I suppose I've contemplated a thousand different means of escaping, but none of them is worth mentioning. But if I don't get out of here soon, I shall go stark raving mad!



For almost an hour after it happened, I sat in this room and just wept. I realize that it is not the style in our culture for a grown man to weep, but there are

times when cultural taboos must be forgotten. Again, had I thought much about the sort of experiments He must have had in mind, I most probably could have predicted the next step. Even so, I most likely would have repressed the knowledge.

One of the standard problems which any learning psychologist is interested in is this one—will an animal learn something if you fail to reward him for his performance? There are many theorists, such as Hull and Spence, who believe that reward (or "reinforcement," as they call it) is absolutely necessary for learning to occur. This is mere stuff and nonsense, as anyone with a grain of sense knows, but nonetheless the "reinforcement" theory has been dominant in the field for years now. We fought a hard battle with Spence and Hull, and actually had them with their backs to the wall at one point, when suddenly they came up with the concept of "secondary reinforcement." That is, anything associated with a reward takes on the ability to act as a reward itself. For example, the mere sight of food would become a reward in and of itself—almost as much a reward, in fact, as is the eating of the food. The *sight* of food, indeed! But nonetheless, it saved their theories for the moment.

For the past five years now, I have been trying to design an experiment that would show beyond a shadow of a doubt that the *sight* of a reward was not sufficient for learning to take place. And now look at what has happened to me!

I'm sure that He must lean towards Hull and Spence in His theorizing, for earlier today, when I found myself in the jumping stand room, instead of being rewarded with my usual protein balls when I made the correct jump, I—I'm sorry, but it is difficult to write about even now. For when I made the correct jump and the door opened and I started towards the food trough, I found it had been replaced with a photograph. A calendar photograph. You know the one. Her name, I think, is Monroe.

I sat on the floor and cried. For five whole years I have been attacking the validity of the secondary reinforcement theory, and now I find myself giving Him evidence that the theory is correct! For I cannot help "learning" which of the doors is the correct one to jump through. I refuse to stand on the apparatus and have the life shocked out of me, and I refuse to pick the wrong door all the time and get an icy bath time after time. It isn't fair! For He will

doubtless put it all down to the fact that the mere *sight* of the photograph is functioning as a reward, and that I am learning the problems merely to be able to see Miss What's-her-name in her bare skin!

I can just see Him now, sitting somewhere else in this spaceship, gathering in all the data I am giving Him, plotting all kinds of learning curves, chortling to Himself because I am confirming all of His pet theories. I just wish....



Almost an hour has gone by since I wrote the above section. It seems longer than that, but surely it's been only an hour. And I have spent the time deep in thought. For I have discovered a way out of this place, I think. The question is, dare I do it?

I was in the midst of writing that paragraph about His sitting and chortling and confirming His theories, when it suddenly struck me that theories are born of the equipment that one uses. This has probably been true throughout the history of all science, but perhaps most true of all in psychology. If Skinner had never invented his blasted box, if the maze and the jumping stand had not been developed, we probably would have entirely different theories of learning today than we now have. For if nothing else, the type of equipment that one uses drastically reduces the type of behavior that one's subjects can show, and one's theories have to account only for the type of behavior that appears in the laboratories.

It follows from this also that any two cultures that devise the same sort of experimental procedures will come up with almost identical theories.

Keeping all of this in mind, it's not hard for me to believe that He is an iron-clad reinforcement theorist, for He uses all of the various paraphernalia that they use, and uses it in exactly the same way.

My means of escape is therefore obvious. He expects from me confirmation of all His pet theories. Well, he won't get it any more! I know all of His theories backwards and forwards, and this means I know how to give Him results that will tear His theories right smack in half!

I can almost predict the results. What does any learning theorist do with an animal that won't behave properly, that refuses to give the results that are

predicted? One gets rid of the beast, quite naturally. For one wishes to use only healthy, normal animals in one's work, and any animal that gives "unusual" results is removed from the study but quickly. After all, if it doesn't perform as expected, it must be sick, abnormal, or aberrant in one way or another....

There is no guarantee, of course, what method He will employ to dispose of my now annoying presence. Will He "sacrifice" me? Or will He just return me to the "permanent colony"? I cannot say. I know only that I will be free from what is now an intolerable situation.

Just wait until He looks at His results from now on!

FROM: Experimenter-in-Chief, Interstellar Labship PSYCH-145

TO: Director, Bureau of Science

Thlan, my friend, this will be an informal missive. I will send the official report along later, but I wanted to give you my subjective impressions first.

The work with the newly discovered species is, for the moment, at a standstill. Things went exceedingly well at first. We picked what seemed to be a normal, healthy animal and smattered it into our standard test apparatus. I may have told you that this new species seemed quite identical to our usual laboratory animals, so we included a couple of the "toys" that our home animals seem so fond of—thin pieces of material made from wood-pulp and a tiny stick of graphite. Imagine our surprise, and our pleasure, when this new specimen made exactly the same use of the materials as have all of our home colony specimens. Could it be that there are certain innate behavior patterns to be found throughout the universe in the lower species?

Well, I merely pose the question. The answer is of little importance to a Learning Theorist. Your friend Verpk keeps insisting that the use of these "toys" may have some deeper meaning to it, and that perhaps we should investigate further. At his insistence, then, I include with this informal missive the materials used by our first subject. In my opinion, Verpk is guilty of gross anthropomorphism, and I wish to have nothing further to do with the question. However, this behavior did give us hope that our newly discovered

colony would yield subjects whose performances would be exactly in accordance with standard theory.

And, in truth, this is exactly what seemed to be the case. The animal solved the Bfian Box problem in short order, yielding as beautiful data has I have ever seen. We then shifted it to maze, maze-reversal and jumping stand problems, and the results could not have confirmed our theories better had we rigged the data. However, when we switched the animal to secondary reinforcement problems, it seemed to undergo a strange sort of change. No longer was its performance up to par. In fact, at times it seemed to go quite berserk. For part of the experiment, it would perform superbly. But then, just as it seemed to be solving whatever problem we set it to, its behavior would subtly change into patterns that obviously could not come from a normal specimen. It got worse and worse, until its behavior departed radically from that which our theories predicted. Naturally, we knew then that something had happened to the animal, for our theories are based upon thousands of experiments with similar subjects, and hence our theories must be right. But our theories hold only for normal subjects, and for normal species, so it soon became apparent to us that we had stumbled upon some abnormal type of animal.

Upon due consideration, we returned the subject to its home colony. However, we also voted almost unanimously to request from you permission to take steps to destroy the complete colony. It is obviously of little scientific use to us, and stands as a potential danger that we must take adequate steps against. Since all colonies are under your protection, we therefore request permission to destroy it.

I must report, by the way, that Verpk's vote was the only one which was cast against this procedure. He has some silly notion that one should study behavior as one finds it. Frankly, I cannot understand why you have seen fit to saddle me with him on this expedition, but perhaps you have your reasons.

Verpk's vote notwithstanding, however, the rest of us are of the considered opinion that this whole new colony must be destroyed, and quickly. For it is obviously diseased or some such—as reference to our theories has proven. And should it by some chance come in contact with our other colonies, and infect our other animals with whatever disease or aberration it has, we would never be able to predict their behavior again. I need not carry the argument

further, I think.

May we have your permission to destroy the colony as soon as possible, then, so that we may search out yet other colonies and test our theories against other healthy animals? For it is only in this fashion that science progresses.

Respectfully yours,
Iowyy

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THEORY ***

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