

Dolphin-Human Relation and LSD 25

John C. Lilly, M.D.*

We are exploring the dolphins with LSD 25 in several areas. We started out with a physiological hypothesis: anything which would modify central nervous system activity as radically as LSD 25 does, might interfere with respiration in the dolphin. The dolphin might stop breathing. We were then prepared to put it in a respirator. The effect was the opposite of the barbiturates (barbiturates at 10 mg per kilogram knocked out respiration completely). The effect on the first dolphin we tried it on was an acceleration of respiration.

Dr. Fremont-Smith: With LSD?

Dr. Lilly: Yes, with LSD 25, 100 mcg dose in a 400-pound animal. There was about a 50 percent increase in the respiration rate at the beginning and then a four-times increase in the rate at the peak of the effect. At the same time the heart rate went up 20 percent. We recorded the events on a tape recorder. I reported (before the controls were run) to Dr. Cohen that we had found a specific acceleration of respiration with LSD 25.

Our first animal was out of water, he was stranded. This is something which causes dolphins a great deal of distress. In other words, they are in a continuous state of anxiety when they are out of water. At the same time there was a low level of pain in this particular one. We found out later that there were pressure point lesions which they get when they are taken out of water.

Along the way, however, we were recording vocalizations and found that during the LSD experience he regularized his vocal output at a steady 10 to 30 percent duty cycle; the controls oscillated widely between zero and 70 percent. We followed this very carefully and finally derived a measure of vocal activity which might be useful in psychiatric studies.

One takes the fraction of the time we spend talking or vocalizing per minute. Plot these during the LSD experience and run controls before and after, and with a placebo. One finds that the effect of the LSD is to raise the vocal index (duty cycle) to a level of 10 to 30 percent steadily with anxiety present. Without anxiety and without stimulation, the duty cycle

* Director, Communication Research Institute, Miami.

is zero. Very frequently under LSD with stimulation it does not drop to zero at all. There is a sustained level, and each stimulus increases the vocalization activity and keeps it going in a very prolonged "after discharge." In other words, one stimulus will raise the vocal index for about five minutes. Without LSD it will only raise it for about fifteen seconds.

We ran careful controls, changing the second setting, putting an animal in a small tank with another animal; putting it in a small tank with shallow water alone; putting it in a very large tank where it had complete freedom of swimming. As we began to free it up and get it more toward its natural conditions of free swimming in deep water, the vocalization index dropped closer and closer to zero and then stayed there. We obtained a very brief enhancement vocalization twenty minutes after the initial dose of 100 mcg. When the dose was increased to 300 mcg, there was a more sustained effect, over and above the results with placebos; this effect lasted about an hour at a very low level near zero.

If a person enters the tank, the vocalization index goes up and stays up with LSD. It rises only briefly without LSD. If you put a second dolphin in with the first (with the LSD) the vocalization index rises and stays up right around 70 percent for the full three hours. In other words, an appropriate exchange now begins to take place. The other animal, by the way, is answering him and his vocalization index also is up.

If you now put in a placebo, the performance is very much lower, it is only around 10 percent as opposed to 70 percent. We find, then, that we have here a behavioral measure, if you wish, of a very sensitive process. We find that the effective quantitative range over which this particular behavioral variable runs is about four log units.

There are some difficulties with it. You have to take running averages through your data; this is most easily done with a computer program. In regard to the second setting, once again I will bring up the term "fear." I think it is very appropriate in these kinds of situations. A dolphin out of water is in a fear-evoking and anxiety-producing situation. If you now give him "tender loving care" during this state, one can reduce these measures down toward a normal value.

We have several dedicated women at our laboratory who give "tender loving care" to the dolphins under all sorts of conditions. I have rather an ideal "mother" over at St. Thomas who is quite willing to live with them and to give them very close attention. She has spent several months working with what we now think is rather an unusual case.

We have one dolphin that we received two and a half years ago. In this particular instance this dolphin had been shot with a spear gun three times through the tail. We knew this dolphin before; we had helped the owners get a very close relationship with this same dolphin; we knew her behavior before the trauma happened. After it had happened she would not come near human beings at all.

In our pool she would stay on the far side away from anybody that was there. If you tried to approach her, she would shoot away from you. She acted like this for two years. We decided to use her as one of our controls, using LSD 25.

As the LSD effect came on, forty minutes after the injection of 100 mcg, the dolphin came over to me. She had not approached me before. She stayed still in the tank with one eye out of water looking me in the eye for ten minutes without moving. This was a completely new behavior. I moved around to see if there would be any effect from my movements. She followed me right around the edge of the tank. I moved out of the room, and the assistant moved into position. The same behavior continued. It is a very amazing change in behavior. She will now come within five feet of me instead of staying twenty feet away.

Dr. Fremont-Smith: She had only one treatment?

Dr. Lilly: Yes, one. I want to emphasize the roots of psychotherapy. One of the roots is verbal, with meaningful sounds being made and a verbal exchange taking place between the therapist and the patient. The next one is merely vocal. Each makes noises that have no verbal meaning but have meaning on another level. The third one is physical contact. We do not use the verbal level. We do use the vocal level. There is sort of a "nonsense" exchange taking place a good deal of the time when you are with a dolphin. We do use the physical contact. Here is where we do exchange on the non-verbal and non-vocal level. We have developed a "silent" language, half of which the dolphins have taught us. They will tell us when they don't want us in the pool, they will tell us when they do want us to come in. They do this by gestures, by nudging, stroking and all sorts of this kind of non-verbal, non-vocal language. It is a very primitive level, but it is absolutely necessary in order to make any progress on the other levels. One dolphin, called Elvar, was not functioning on any level until we were willing to go into the water with him, and meet him in his element, and get very close to him in a physical sense. There are only a few people, we find, who can do this. Fear of the huge size of these animals, the threat of being in the water with them, the possibility of being drowned, or badly hurt, overcomes their intellectual awareness of the maxim—"No dolphin has ever hurt anybody badly." This is a very primitive fear that develops in humans. I have had it myself, and every so often it comes up again if an animal really threatens by either charging or biting. They will take an occasional nip at you, or they may bark. We have learned to leave the pool when these things happen. Fifteen minutes later the picture may be completely changed.

The important thing for us with the LSD in the dolphin is that what we see has no meaning in the verbal sphere. The meaning resides completely in this non-verbal exchange. This is where our progress has been made in the last three or four years—in developing this other level, because we were forced to. We have had to do it in order to make any progress on the vocalization and communication. In other words, we accept communication on any level where we can reach it. We are out of what you might call the rational exchange of complex ideas because we haven't developed communication in that particular way as yet. We hope to eventually. We do it on a level of a mother-child relationship and we find that this particularly motherly type of woman makes the fastest progress. I don't have the patience to do what they will do. For example,

that girl in St. Thomas spent a full week, twenty-four hours a day, with the dolphin, in sixteen inches of water. She cooked and slept in that area, wet. She has learned now how to live wet. She has learned the proper kind of clothing to wear; she has learned that she can't have any electrical appliances, so we have given her a propane stove for cooking, and so forth. We are modifying two rooms at the laboratory, one on a balcony out in the sun, and one inside. We have taken the tank out and are making the two rooms into a tank with two feet of water in it. The girl has areas where she can climb out of the water, and the dolphin has areas where she can get into deeper water. The human-dolphin relationship seems to develop best in eighteen to twenty-four inches of water. In other words, the dolphin can still swim, and the person can still walk or sit down or lie down, without fear of drowning, so that we can meet the dolphins about half way. The response of these animals is excellent when one does this. They apparently are quite willing and able to live under these conditions. In two cases dolphins that started when they were young enough substituted human company for dolphin company. They now prefer the humans.

Dr. Fremont-Smith: It was extraordinarily appropriate to this Conference—your telling us about the dolphin that had been injured and therefore avoided humans, and had been brought back into this intimate contact, under LSD, with a loving motherly creature. This seems to me to fit so closely with what we have been learning about the needs of human beings who are being treated with LSD. I am delighted with it. I missed calling on Dr. Kramer before, and in view of the fact that he is trained as a pathologist and seems to be quite a psychotherapist also, by accident or design—I don't know which—I wish he would make a comment at this point.

Dr. Kramer: I think you took the words out of my mouth, because these two occasions are the first opportunities I've had to listen to Dr. Lilly talk about dolphins. I was singularly impressed on both occasions with one quality and that is the caution with which he approaches his animals. I think that is a quality that is appropriate to learning anything about a new phenomenon, and I think it is particularly appropriate to working with patients in a therapeutic relationship, or to the use of LSD in a therapeutic relationship. I know that we ethologists have often been criticized for not being sufficiently objective in many of our observations. One of the things we try to do before we begin any objective experimental procedures is this: we really try to get to know the animal, and to form some sort of bond, some sort of relationship with the animal that will make it possible to perform objective experiments or experimental studies without violating the sense and meaning of the animal.

I remember that Konrad Lorenz once talked about the nature of the bond that forms between geese. Instead of talking about the love between a pair of geese, he simply spoke about the bond and formation. Somebody asked him how he would define that quality of love, or bond and formation, and he replied, "Well, I would say that the relationship or interpersonal valence," as he put it, "is the same as the home valence of the animal in its territory." In other words, that animal feels with a bonded animal exactly as if it is at home, and perhaps this is the point that we

have been getting at in talking about setting. Unless the animal feels absolutely at home, then much of this material fails to emerge. So I want to say again how impressed I am with the approach that Dr. Lilly has taken to his animals, a group of animals about which very few people ever knew anything. And I don't think he would have learned anything unless he had taken this particular approach to these dolphins.

Dr. Fremont-Smith: May I simply add that "at home," curiously enough, somehow seems to be related to mother. Most of us had our first home with our mothers, and most of us want to go home to mother, whether it's apple pie or not—that is when we are young and haven't built our own homes.

Dr. Lilly: All of these points are very well taken. We learned quite quickly when we began this research that if anybody working with a dolphin assumed that the dolphin was stupid, then the dolphin would act stupid. If you went at the dolphin the way you would at a rat, and tried to get him to perform, he'd perform very well for a very short period of time. If the criteria were too strict, and you put him down in too narrow a slot, so that you bored him, he would break the apparatus and throw it out of the tank. We have had several psychologists who came to the lab expecting to work with the dolphins the way they would with rats, and the dolphins won't put up with it. It is very dramatic when the system breaks down. We explain this to the psychologists, and say, "Get in the tank with them. Make friends with them, and maybe they will put up with it a little longer."

The humans won't do this. I suspect that, if they went into this analytically, they would find it is their own fear which dictates the way they try to work with the dolphins.

Another point is the basic beliefs with which one approaches this work. You come believing in their intelligence, and then listen to them, and let them tell you what the experiment is going to be; to a certain extent let them dictate the terms on their side and you get the performance.

Dr. Fremont-Smith: Isn't there a real analogy, you used the word "dictate," but isn't there a real analogy from what you just said to the way the best therapist relates herself or himself with the patient? He doesn't dictate. The patient plays a very important role in saying what's going to come next and what the style of the relationship is going to be. It seems to me you really described in slightly different words what is really implicit and explicit in our best psychotherapeutic situation.

Dr. Lilly: The day you frighten the patient is the day your therapy won't work.

Dr. Hertz: I wonder if you have observed any rhythmic activity? With patients I have observed what I interpret as alterings in rhythmic activity. I try to have the patient breathe at a certain rate; the time was estimated as too slow one moment and too fast the next; and so I am wondering if you have experienced this?

Dr. Lilly: Yes, there are a multiplicity of rhythms in relationship which we have to watch very carefully, and one of the predominant ones which you find with dolphins, you can find it with humans too. If you

immerse the dolphins in water—that is that they can work fast for about ten to twenty minutes, and you can get a magnificent result. They then want to take a five minute “time-out,” and you must give it to them. If you try to press them through that time, you will get only the response to an irritation. They go away from you, and just swim around and relax. Then they come back and are all ready to go again. This is their sleep time. They sleep five minutes out of, say, half an hour, all day long and all night long, with a slight peak during the night. You see the same thing with LSD. They slow down but they do not sleep.

Miss Wicks: I was quite fascinated by your talk about dolphins because it is so close to my own experiences working with delinquents and people who have been so damaged that they can't trust or relate to anybody. I know from experience in working with these people for years, who never give in, and who always hit back at society, and I have had the same experience you had. After one or two treatments with LSD they are feeling for the first time that they are actually relating, and that it is possible to get near someone, and that it is all part of the process of loving—and then be able to accept love.

Dr. Lilly: Then you must have the same feeling that we have for the animals.

Miss Wicks: Just the same, particularly under LSD, when they [the patients] act out aggressively. One does have it, I know I do. There is an underlying feeling that they may attack, but they never do. One sort of puts one's faith in—

Dr. Lilly: Actually dolphins never attack, but you have to believe this. It always looks as if the next day may be the first time. They are huge animals, and are very powerful.

I am very much indebted to the Conference for the opportunity to learn what other people are thinking along lines very similar to the ones we are pursuing. We are pursuing them in a somewhat different area, but I don't let that inhibit me, as you can see. I think it is important when working with such a large animal that we make use of everything that we can possibly learn about our own species. The respect and integrity that we detect in our own species, we at least temporarily must attribute to the animals, and treat them in that fashion. The question of whether you call them animals or not seems to disappear in the laboratory. You now include yourself as an “animal” and go on calling them “animals,” or you drop that term completely and go on calling them by one name—a dolphin—this is a measure of the warmth which has developed. Anybody who is still calling them animals, in terms of cats and monkeys, we sort of disown.