

The Hundredth Monkey Phenomenon

A remarkable New Age claim of 'collective consciousness'—a 'spontaneous' appearance of potato-washing behavior in a group of monkeys—falls to scrutiny. The way belief in this claim grew exemplifies the methodology of pseudoscience.

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CLAIMS OF THE paranormal are supported in many ways. Personal reports ("I was kidnapped by extraterrestrials"), appeals to puzzling everyday experiences ("Did you ever get a phone call from someone you had just dreamed about?"), and references to "ancient wisdom" are a few. Citations of actual scientific results are usually limited to ESP experiments and a few attempts to mystify further the already bizarre discoveries of modern physics. But the New Age is upon us (we're told) and New Age authors like Rupert Sheldrake (1981) and Lyall Watson (1979) support their new visions of reality with scientific documentation. Sheldrake has a bibliography of about 200 listings, and Watson lists exactly 600 sources. The sources cited are mostly respectable academic and scientific publications. The days of "[unnamed] scientists say" and "Fred Jones, while walking alone in the woods one day . . ." are gone. Or are they?

I teach college courses in epistemology, in the philosophy of science, and in pseudoscience and the occult. Students in these courses naturally bring to class examples of remarkable and paranormal claims. During the past few years one such claim has become especially popular, the "Hundredth Monkey Phenomenon." This phenomenon was baptized by Lyall Watson, who documents the case with references to five highly respectable articles by Japanese primatologists (Imanishi 1963; Kawai 1963 and 1965; Kawamura 1963; and Tsumori 1967). Watson's discussion of this phenomenon covers less than two pages. (Except where noted, all references to Watson are to pages 147 and 148.) But this brief report has inspired much attention. Following Watson, a book (Keyes 1982), a newsletter

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From Masao Kawai, *Primates*, 6:1-30, 1965

One of the monkeys washing a sweet potato.

article (*Brain/Mind Bulletin* 1982), and a film (Hartley 1983) have each been created with the title "The Hundredth Monkey." In addition we find a journal article entitled "The 'Hundredth Monkey' and Humanity's Quest for Survival" (Stein 1983) and an article called "The Quantum Monkey" in a popular magazine (*Science Digest* 1981). Each relies on Watson as the sole source of information on the remarkable and supernatural behavior of primates.

The monkeys referred to are indeed remarkable. They are Japanese macaques (*Macaca fuscata*), which live in wild troops on several islands in Japan. They have been under observation for years. During 1952 and 1953 the primatologists began "provisioning" the troops—providing them with such foods as sweet potatoes and wheat. This kept the monkeys from raiding farms and also made them easier to observe. The food was left in open areas, often on beaches. As a result of this new economy, the monkeys developed several innovative forms of behavior. One of these was invented in 1953 by an 18-month-old female that the observers named "Imo." Imo was a member of the troop on Koshima island. She discovered that sand and grit could be removed from the sweet potatoes by washing them in a stream or in the ocean. Imo's playmates and her mother learned this trick from Imo, and it soon spread to other members of the troop. Unlike most food customs, this innovation was learned by older monkeys from younger ones. In most other matters the children learn from their parents. The potato-washing habit spread gradually, according to Watson, up until

1958. But in the fall of 1958 a remarkable event occurred on Koshima. This event formed the basis of the “Hundredth Monkey Phenomenon.”

The Miracle on Koshima

According to Watson, all of the juveniles on Koshima were washing their potatoes by early 1958, but the only adult washers were those who had learned from the children. In the fall of that year something astounding happened. The exact nature of the event is unclear. Watson says:

... One has to gather the rest of the story from personal anecdotes and bits of folklore among primate researchers, because most of them are still not quite sure what happened. And those who do suspect the truth are reluctant to publish it for fear of ridicule. So I am forced to improvise the details, but as near as I can tell, this is what seems to have happened. In the autumn of that year an unspecified number of monkeys on Koshima were washing sweet potatoes in the sea. . . . Let us say, for argument's sake, that the number was ninety-nine and that at eleven o'clock on a Tuesday morning, one further convert was added to the fold in the usual way. But the addition of the hundredth monkey apparently carried the number across some sort of threshold, pushing it through a kind of critical mass, because by that evening almost everyone was doing it. Not only that, but the habit seems to have jumped natural barriers and to have appeared spontaneously, like glycerine crystals in sealed laboratory jars, in colonies on other islands and on the mainland in a troop at Takasakyama.

A sort of group consciousness had developed among the monkeys, Watson tells us. It had developed suddenly, as a result of one last monkey's learning potato washing by conventional means. The sudden learning of the rest of the Koshima troop was not attributable to the normal one-monkey-at-a-time methods of previous years. The new phenomenon of group consciousness was responsible not only for the sudden learning on Koshima but for the equally sudden acquisition of the habit by monkeys across the sea. Watson admits that he was forced to “improvise” some of the details—the time of the day, the day of the week, and the exact number of monkeys required for the “critical mass” were not specified in the scientific literature. But by evening (or at least in a very short period of time) almost everyone (or at least a large number of the remaining monkeys) in the colony had suddenly acquired the custom. This is remarkable in part because of the slow and gradual mode of acquisition that had typified the first five years after Imo's innovation. Even more remarkable was the sudden jumping of natural boundaries, apparently caused by the Koshima miracle.

Documentation

In this section I investigate the relations between Watson's description of

the Hundredth Monkey Phenomenon and the scientific sources by which he validates it. To be sure, we must not expect too much from the sources. Watson has warned us that the complete story was not told and that he was "forced to improvise the details." But we should expect to find some evidence of the mysteriousness of the Koshima events of 1958. In particular, we should expect to find evidence of an episode of sudden learning within the troop at this time (though perhaps not in one afternoon) and evidence of the sudden appearance of potato washing in other troops sometime soon after the Koshima event. We also have a negative expectation of the literature; it should *fail* to report certain important details. It will not (we expect) tell us the exact number of monkeys washing potatoes prior to or after the event of 1958, nor will it provide us with an explanation of how the post-event Koshima learners were able to acquire their knowledge. After all, it is Watson's claim that the event produced *paranormal* learning of potato washing. These three expectations will be tested against the literature. Was there a sudden event at Koshima? Did acquisition at other colonies follow closely the Koshima event? Does Watson improvise details *only* when the cited literature fails to provide adequate information? The following comments will be restricted to the literature on macaques actually cited by Watson.

Almost all of the information about the Koshima troop appears in a journal article by Masao Kawai (1965); the other articles are secondary on this topic. Kawai's article is remarkably detailed in its description of the Koshima events. The troop numbered 20 in 1952 and grew to 59 by 1962. (At least in the numerical sense, there was never a "hundredth monkey" on Koshima.) Watson states that "an unspecified number" of monkeys on Koshima had acquired the potato-washing habit by 1958. Actually this number was far from unspecified. Kawai's data allowed the reader to determine the dates of acquisition of potato washing (and two other food behaviors), as well as the dates of birth and geneological relationships, *of every monkey in the Koshima troop from 1949 to 1962* (Figure 1, pp. 2-3, and elsewhere in the paper). In March 1958, exactly 2 of 11 monkeys over 7 years old had learned potato washing, while exactly 15 of 19 monkeys between 2 and 7 had the habit (p. 3). This amounts to 17 of 30 noninfant monkeys. There is no mention in this paper (or in any other) of a sudden learning event in the fall of 1958. However, it is noted that by 1962, 36 of the 49 monkeys had acquired the habit. So both the population and the number of potato washers had increased by 19 during this four-year period. Perhaps this is what suggested to Watson that a sudden event occurred in the fall of 1958. And perhaps (since one can only surmise) this idea was reinforced in Watson's mind by the following statement by Kawai: "The acquisition of [potato washing] behavior can be divided into two periods; before and after 1958" (p. 5).

So Kawai does not give a time of year, a day of the week, or even the season for any sudden event in 1958. But he does at least identify the year.

And is Kawai mystified about the difference between pre- and post-1958 acquisition? Is he “not quite sure what happened”? Is he reluctant to publish details “for fear of ridicule”? No. He publishes the whole story, in gothic detail. The post-1958 learning period was remarkable only for its normalcy. The period from 1953 to 1958 had been a period of exciting innovation. The troop encountered new food sources, and the juveniles invented ways of dealing with these sources. But by 1958 the innovative youth had become status quo adults; macaques mature faster than humans. The unusual juvenile-to-adult teaching methods reverted to the more traditional process of learning one’s food manners at one’s mother’s knee. Imo’s first child, a male named “Ika,” was born in 1957 (pp. 5, 7). Imo and her former playmates brought up their children as good little potato-washers. One can only hope that Ika has been less trouble to his Mom than Imo was to hers. Kawai speaks of the innovative period from 1953 to 1958 as “individual propagation” (p. 5) and the period after 1958 as “pre-cultural propagation” (p. 8). (This latter term does not indicate anything unusual for the monkey troops. The troops under normal circumstances have behavioral idiosyncrasies and customs that are passed along within the group by “pre-cultural” means. The expression only indicates a reluctance to refer to monkey behavior as genuinely “cultural.”)

So there was nothing left unsaid in Kawai’s description. There was nothing mysterious, or even sudden, in the events of 1958. Nineteen fifty-eight and 1959 were the years of maturation of a group of innovative youngsters. The human hippies of the 1960s now know that feeling. In fact 1958 was a singularly poor year for habit acquisition on Koshima. Only two monkeys learned to wash potatoes during that year, young females named Zabon and Nogi. An average of three a year had learned potato washing during the previous five years (Table 1, p. 4). There is no evidence that Zabon and Nogi were psychic or in any other way unusual.

Let us try to take Watson seriously for a moment longer. Since only two monkeys learned potato washing during 1958 (according to Watson’s own citation), one of them must have been the “Hundredth Monkey.” Watson leaves “unspecified” which monkey it was, so I am “forced to improvise” and “say, for argument’s sake” that it was Zabon. This means that poor little Nogi carries the trim metaphysical burden of being the “almost everyone in the colony” who, according to Watson, suddenly and miraculously began to wash her potatoes on that autumn afternoon.

Watson claims that the potato-washing habit “spontaneously” leaped natural barriers. Is there evidence of this? Well, two sources report that the behavior was observed off Koshima, in at least five different colonies (Kawai 1965, 23; Tsumori 1967, 219). These reports specifically state that the behavior was observed only among a few individual monkeys and that it had not spread throughout a colony. There is no report of when these behaviors occurred. They must have been observed sometime between 1953 and 1967. But there is nothing to indicate that they followed closely

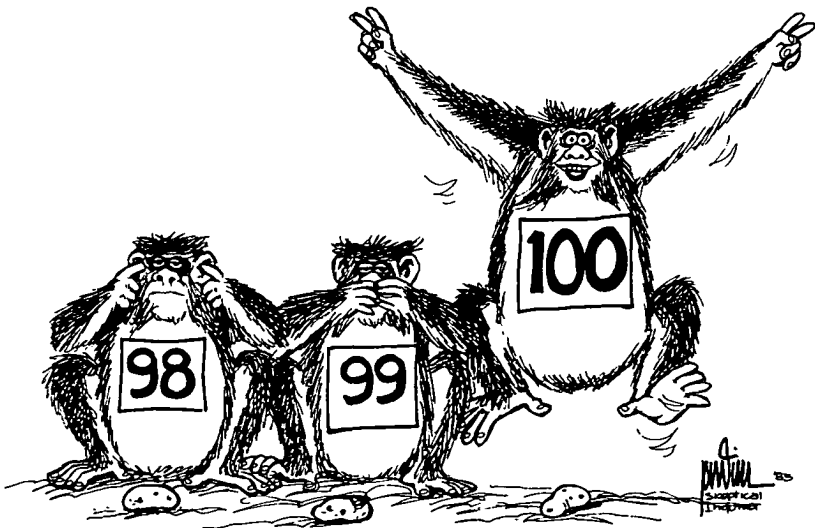
upon some supposed miraculous event on Koshima during the autumn of 1958, or that they occurred suddenly at any other time, or that they were in any other way remarkable.

In fact there is absolutely no reason to believe in the 1958 miracle on Koshima. There is every reason to deny it. Watson's description of the event is refuted *in great detail* by the very sources he cites to validate it. In contrast to Watson's claims of a sudden and inexplicable event, "Such behavior patterns seem to be smoothly transmitted among individuals in the troop and handed down to the next generation" (Tsumori 1967, 207).

Methodology of Pseudoscience

The factual issue ends here. Watson's claim of a "Hundredth Monkey Phenomenon" is conclusively refuted by the very sources he cites in its support. He either failed to read or misreported the information in these scientific articles. But Watson's own mode of reasoning and reporting, as well as the responses he has inspired in the popular literature, deserve attention. They exemplify the pseudoscientific tradition. Consider the following:

1. Hidden sources of information: Watson informs us that the scientific reports leave important data "unspecified." This is simply false. But, more subtly, he tells us that most of the researchers are still unsure of what happened and that those who "do suspect the truth are reluctant to publish it for fear of ridicule." In one fell swoop Watson brands himself as courageous, explains why no one else has dared report this miraculous phenomenon, and discourages us from checking the cited literature for



corroboration. Watson got the real story from “personal anecdotes and bits of folklore among primate researchers. . . .” Those of us who don’t hobnob with such folks must trust Watson. The technique was effective. Of the commentaries I have found on the Hundredth Monkey Phenomenon, not one shows evidence of having consulted the scientific sources cited by Watson. Nonetheless, each presents Watson’s fantasy as a scientifically authenticated fact. Nor is additional information available from Watson. I have written both to Watson and to his publishers requesting such information and have received no reply.

2. Aversion to naturalistic explanations: The fact is that potato washing was observed on different islands. Watson infers that it had traveled in some paranormal way from one location to another. Like other aficionados of the paranormal, Watson ignores two plausible explanations of the concurrence of potato washing. First, it could well have been an independent innovation—different monkeys inventing the same solution to a common problem. This process is anathema to the pseudoscientist. The natives of the Americas simply *could not have* invented the pyramid independent of the Egyptians—they just didn’t have the smarts. In more extreme cases (von Däniken, for example) a *human being* is just too dumb to invent certain clever things—extraterrestrials must have done it.

Watson assumes that Imo was the only monkey capable of recognizing the usefulness of washing potatoes. In his words, Imo was “a monkey genius” and potato washing is “comparable almost to the invention of the wheel.” Monkeys on other islands were too dumb for this sort of innovation. But keep in mind that these monkeys didn’t even *have* potatoes to wash before 1952 or 1953, when provisioning began. Monkeys in at least five locations had learned potato washing by 1962. This suggests to me that these monkeys are clever creatures. It suggests to Watson that *one* monkey was clever and that the paranormal took care of the rest. A second neglected explanation is natural diffusion. And indeed Kawai reports that in 1960 a potato washer named “Jugo” swam from Koshima to the island on which the Takasakiyama troop lives. Jugo returned in 1964 (Kawai 1965, 17). Watson does not mention this. The Japanese monkeys are known to be both clever and mobile, and either characteristic might explain the interisland spread of potato washing. Watson ignores both explanations, preferring to invent a new paranormal power.

3. Inflation of the miracle: As myths get passed along, everyone puffs them up a bit. The following two examples come from second-generation commentaries that quote extensively from Watson. Nevertheless, even Watson’s claims are beginning to bulge. First, the primatologists’ reports had mentioned that only a few isolated cases of off-Koshima potato-washing were observed. Watson reports this as the habit’s having “appeared spontaneously . . . in colonies on other islands. . . .” Not actually false, since the few individuals were indeed *in* other colonies (though only individuals and not whole colonies adopted the behavior). Following Watson,

Ken Keyes reports that, after the hundredth Koshima monkey, "colonies of monkeys on other islands . . . began washing their sweet potatoes"! (Keyes 1982, p. 16). From Keyes, one gets the image of spontaneous mass orgies of spud-dunking. A second example: Regarding the primatologists' attitudes toward the events of 1958, Watson reports only that they are "still not quite sure what happened." But the primatological confusion quickly grows, for *Science Digest* (1981) reports "a mystery which has stumped scientists for nearly a quarter of a century." In these two particular cases, Watson's own statements are at least modest. They're not what one would call accurate, but not exorbitantly false either. By the second generation we find that "not quite sure what happened" becomes "stumped for nearly a quarter of a century," and the habit that *appeared in* individuals within colonies of monkeys becomes a habit *of* colonies of monkeys. Please keep in mind that the second generation relies *only* on Watson for its information; even Watson's none-too-accurate report has been distorted—and not, needless to say, in the direction of accuracy.

4. The paranormal validates the paranormal: The validity of one supernatural report is strengthened by its consistency with other such reports. Watson's commentators show how this works. Keyes supports the Hundredth Monkey Phenomenon by its consistency with J. B. Rhine's work at Duke, which "demonstrated" telepathy between individual humans. "We now know that the strength of this extrasensory communication can be amplified to a powerfully effective level when the consciousness of the 'hundredth person' is added" (Keyes 1982, 18). Elda Hartley's film "The Hundredth Monkey" invokes Edgar Cayce. And in a remarkable feat of group consciousness, *four of the five* secondary sources emphasize the similarities between Watson's Hundredth Monkey Phenomenon and Rupert Sheldrake's notion of the "morphogenetic field." The spontaneous recognition of the similarities between Watson and Sheldrake seems to have leaped the natural boundaries between the four publications! Now *there's* a miracle! (Surely independent invention or natural diffusion couldn't account for such a coincidence.)

Conclusions

I must admit sympathy for some of the secondary sources on the Hundredth Monkey Phenomenon. This feeling comes from the purpose for which the phenomenon was cited. Ken Keyes's book uses the phenomenon as a theme, but the real topic of the book is nuclear disarmament. Arthur Stein's article and (to a lesser extent) the Hartley film are inspired by Keyes's hope that the Hundredth Monkey Phenomenon may help prevent nuclear war. The message is that "you may be the Hundredth Monkey" whose contribution to the collective consciousness turns the world away from nuclear holocaust. It is hard to find fault in this motive. For these very same reasons, one couldn't fault the motives of a child who wrote to

Santa Claus requesting world nuclear disarmament as a Christmas present. We can only hope that Santa Claus and the Hundredth Monkey are not our best chances to avoid nuclear war.

Watson's primary concern is not prevention of war but sheer love of the paranormal. His book begins with a description of a child who, before Watson's own eyes, and with a "short implosive sound, very soft, like a cork being drawn in the dark," psychically turned a tennis ball inside out—fuzz side in, rubber side out—without losing air pressure (p. 18). Just after the Hundredth Monkey discussion, Watson makes a revealing point. He quotes with approval a statement attributed to Lawrence Blair: "When a myth is shared by large numbers of people, it becomes a reality" (p. 148). This sort of relativist epistemology is not unusual in New Age thought. I would express Blair's thought somewhat differently: "Convince enough people of a lie, and it becomes the truth." I suggest that someone who accepts this view of truth is not to be trusted as a source of knowledge. He may, of course, be a marvelous source of fantasy, rumor, and pseudoscientific best-sellers.

I prefer epistemological realism to this sort of relativism. Truth is not dependent on the numbers of believers or on the frequency of published repetition. My preferred epistemology can be expressed simply: Facts are facts. There is no Hundredth Monkey Phenomenon.

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