

this term has in philosophy of mind) is entirely impenetrable to me. I have access only to its results, which depend on the other's action and which, in this sense, are under its control. Therefore, it is indeed the robot's gaze that acts upon me. In commanding the module's result, it leads to my reaction, typically described as spontaneous, and produces in me a feeling of social presence. The robot acts directly on me from where it is seated no less surely than the physician's reflex hammer does when he taps my knee with it.

The idea of action at a distance seems very strange to us today. Traditionally, it is associated with magic, and since Descartes, the modern scientific view of the world has rejected it. Yet the discovery of mirror neurons explains how such an action at a distance between two agents may be possible. Robotics demystifies it, tames it, makes it intelligible. Geminoid shows that there is no mysticism at work here; acting at a distance corresponds neither to an ineffable sense of there being something "between us," nor to a mere anthropomorphic projection. The presence of another is a phenomenon that can be contrived and implemented with the aid of a machine and that therefore can be reproduced and analyzed. The experiments performed by Paré and Straub cast light on what we find unsettling, disconcerting, and on what makes it difficult for us to recognize this way of acting for what it is. The remote effect of a robot's mere presence, without it having to do anything at all, is yet, paradoxically, an action—an action without either act or actor, as it were! Ordinary language may be confusing here, but we have at our disposal an adequate scientific vocabulary. If this action may reasonably be said to be without either act or action, it is because it takes place and unfolds at a subpersonal level where the difference between self and other is not clearly established. It is nevertheless something that the robot does to *me*, to the extent that I passively experience a presence of which it is the cause.

Action at a distance by a robot helps us see that the effect we have upon one another, by the simple fact of our presence, takes place at a

subpersonal level. It takes place without our being able to attribute an action to *someone* or to recognize as the author of the action what we discover to be the cause of the experienced effect. The robot, a machine that we ourselves have constructed, does not act by magic. But we are far from knowing exactly how it does what it does, and we are still farther from being able to determine exactly what effect the robot has on us. Unease, discomfort, familiarity, the sense of being kept at a respectful distance—all these feelings are somehow in play, without our being able to locate the effect definitively in one or another register. The exploration of the uncanny valley made possible by Ishiguro's robot is aimed at answering these questions.

Now the essential thing that Geminoid lacks, considered both as a robot, when it escapes the operator's control, and as part of the team that robot and operator normally form, is the ability to react to the presence of another on a level where it is capable of making its presence felt. There are at least two reasons for this. First, Geminoid is a communication interface that, in a sense, is supposed to stay in the background, behind the operator, whom it allows to be present somewhere he or she is not. Second, the operator experiences the presence of his or her interlocutor only as an image on a screen. Unlike the robot's human partner, the operator does not physically experience the social presence of the other person with whom the robot interacts. No affective loop can be established.

Paro, or Proximity: A Return to Animal-Machines

Paro is described by its creator, Takanori Shibata, as a "mental assist robot" designed to interact physically with human beings.²⁵ It is utilized chiefly as an animal companion for therapeutic purposes in hospitals and homes for the elderly. Paro has the appearance of a baby harp seal (*Pagophilus groenlandicus*) and weighs 2.8 kilos (a little more than six pounds). Like Geminoid, it has no mobility: it is incapable

of moving around by itself and has to be carried from one place to another. It is nevertheless much more autonomous than Professor Ishiguro's look-alike. It is not remotely controlled by an operator, and everything it can do it does by itself. Second, Paro is capable of many more distinct behaviors than Geminoid. It can move its flippers and tail. It blinks its eyes, and each eyelid moves independently to give it a more expressive countenance. It can raise its head. It can emit two cries that resemble those of a real baby harp seal. One of these cries is a call; the other functions as a response when it interacts with human beings. Paro recognizes its name. When it is called, it raises its head and turns it in the direction the sound comes from. It reacts in the same fashion to sudden loud noises. Moreover, it can learn a new name if it is given one. It possesses subcutaneous sensors that allow it to detect when it is touched and how gently or roughly it is being handled (whether it is being petted, for example, or tugged at), and it responds accordingly, manifesting through its cries and movements its displeasure or satisfaction. Finally, even if Paro has available to it only a small number of basic behaviors, the number and diversity of the emergent behaviors that it produces in response to being touched are effectively infinite.²⁶

Paro is a small, extremely cute animal covered with white handmade fur. Most people want to touch it or take it in their arms the moment they see it and rapidly become attached to it, mainly because it seems to react so naturally. Since Paro is not mobile, it is always available; there is no need to look for it or call for it to come. Unlike a dog or a cat, it cannot run away; nor is there any risk of its knocking over a glass of water, of breaking a precious vase, or of sharpening its claws on a pedestal table. Furthermore, Paro is robust: it can be handled by many people, even quite forcibly, without breaking.

Paro has much else to recommend it, particularly in a therapeutic setting. Unlike the coat of a real animal, its antiseptic artificial fur transports neither germs nor lice. It is not necessary to housebreak

Paro or to feed it. It has only to be recharged, by plugging one end of a power cord into an electrical outlet and the other end, which resembles a baby's pacifier, in its mouth. Paro is susceptible neither to stress nor depression. It does not become irritable or aggressive when too many people touch it or take it in their arms. In short, it satisfies all (or at least many) of the requirements of animal therapy, with none of the usual inconveniences. Although Paro is used mainly in connection with the care of elderly residents in assisted living facilities and of children in hospitals, it is sometimes, and particularly in Japan, purchased by both individuals and couples as a substitute pet.

Many studies have shown that Paro has a beneficial effect on the mental and physical health of older people. Contact with it improves their cognitive abilities and emotional expressiveness, as well as their ability to manage stress. Moreover, Paro has a positive influence on the number and quality of social interactions in homes for the elderly. It improves the mood of children undergoing long periods of hospitalization, and it reduces depression.²⁷ Paro provides animal therapy by doing nothing in particular, simply by being there, by being available for repeated encounters—encounters that serve no other purpose or function than social interaction, pure and simple. This is why it is possible to interact with it as one does with a friend, not as one does with a tool or an instrument whose value or utility is associated with a particular task. This may also be why one does not easily grow tired of Paro, why interest does not flag, and why positive therapeutic effects persist, even after several months.²⁸

Paro's outstanding quality is probably its physical appearance. We are familiar with baby seals from magazines, television, and films, and we find them adorable. And yet none of us, or almost no one, grew up as a child with a baby seal as a pet. As a consequence, none of us has any particular expectation regarding the behavior of a baby seal. If Paro looked like a dog, or a cat, or a rabbit, we would have a basis for comparison that would allow us to judge whether its behavior

is realistic. Moreover, Paro cannot move. A dog, a cat, or a rabbit that cannot move is scarcely credible. The problem is that building a four-legged robot capable of moving with the liteness of an animal poses an immense and, for the moment, insuperable technical challenge. In this regard, Paro's lack of mobility presents a dual advantage. It makes its use in a therapeutic setting for the very young and the very old both easier and more reliable, and it simplifies the technical problem of making Paro seem a credible robotic animal, a plausible "animat." Young seals do not move around much on land (ice floes, actually), and slowly at that.

This attempt to imitate and to faithfully reproduce the appearance of a baby seal therefore leaves a great deal to the imagination, which plays an important role in Paro's success. The robot seems a much more natural, much more realistic animal than it actually is because we have no point of reference. Suspending disbelief is all the easier as no one remembers what it was like having a baby seal as a pet. By accepting Paro as a real animal, we supply a context in which it seems to imitate and reproduce usual forms of behavior. When there is a sudden noise, it looks up, just as an animal or a small child does. It responds to its name. It shows signs of contentment when it is stroked gently and of displeasure when it is handled carelessly. Yet within the comparatively narrow range of what it is capable of doing, Paro's behavior is unpredictable. It reacts differently with different people and differently with the same person at different moments. Thus Paro sometimes gives the impression of acting strangely one day and of being happy another. Variations in its behavior are interpreted as revealing its "moods," its "preferences," and its "personality," even if Paro does not really have any of these things.

Does Paro deceive elderly people who find its company comforting? It is not really attached to them. It will not grieve when they die. And yet no one seems to worry whether a teddy bear deceives the child who sleeps peaceably next to it. In what way is Paro dif-

ferent from a remarkably sophisticated and rather expensive stuffed animal?²⁹ The answer is not clear.

It is important to keep in mind that there are a great many things that Paro never does, which makes it more like a toy than a real animal. These include all actions involving either inanimate objects or itself; that is, its own body. Paro's behavior consists solely in its relationship to other agents. It never interacts with things. It does not bite balloons; it does not run after balls. Nor does it show the slightest interest in itself. It neither scratches itself nor licks its fur. The only thing Paro does is respond to the voice that calls it or move its tail and its flippers when it is stroked. It never reacts to an event in the world. Even when it moves its head on hearing a loud noise, this does not lead to any action related to the source of the disturbance; the movement has value only as a proof of companionship, letting others know it hears the same noise. Paro is exceedingly social. Indeed, there is nothing in its world apart from the agents who enter into contact with it. It depends entirely on them in order to exist, for it becomes an agent itself only through a relationship to others when it is taken directly as an object of their action. The rest of the time it is a dead thing, an inanimate object.

Paro has no interests of its own. It is sensitive only to the interest shown it—whence the impression that it is interested in you and no one else. While it is true that Paro reacts when it hears its name, for the most part interest must be communicated tactfully for it to react: Paro needs to be touched, taken in one's arms, carried. By their very nature, intimate encounters of this sort tend to exclude others. If Paro is exceedingly social, then, it is nonetheless social in an exclusively individualistic way. It seems to establish a special relationship with every person it meets. What is more, it will never betray to anyone the secrets that you have confided in it.

At first sight, there is something paradoxical about this exclusive individualism, for Paro often facilitates social interaction among the

residents of homes for the elderly. People who no longer speak to one another suddenly begin spending more time together, conversing in common rooms.³⁰ Yet if Paro facilitates social interaction, it is by coming between people, as an object rather than as an agent. Paro can take part only in an extremely limited way in the conversation of a group for which it is the center of attention. In this case, it is hardly an interlocutor—more a facilitator or a pretext. It is *something that is spoken of*, not *something that is spoken to*—unlike what happens in its one-to-one relationships. Paro facilitates conversation and social contact among those gathered around it, without being a member of their circle. It gives them a subject of conversation, something that is agreeable to talk about and show an interest in, but it cannot itself converse with them. In its one-on-one relationships, Paro functions more as an agent, though here again it remains apart from, and indifferent to, the activities of the individuals whom it provides with a reason for coming together as a group. It has no interest in anything that is said *about* it. Only someone who speaks to it directly can attract and hold its attention. Paro is incapable of entering into a relationship with others in the way that its availability allows them to interact among themselves—which is to say, through the intermediary of something that brings them together by separating them. No object can mediate a relationship between Paro and others; no person can mediate a relationship between Paro and objects.

KASPAR and Caring

KASPAR (an acronym for Kinesics and Synchronisation in Personal Assistant Robotics) is a robot originally conceived as part of a research project begun in the late 1990s by Kerstin Dautenhahn and her collaborators at the University of Reading in England.³¹ Initially, the objective was to develop “robotic therapy games” to facilitate communication with autistic children and to help them interact with

others.³² In 2005, now at the University of Hertfordshire, the KASPAR Project was formally launched with the aim of developing a “social” robot having two missions: first, and mainly, to be a “social mediator” responsible for facilitating communication between autistic children and the people with whom they are in daily contact, other children (autistic or not), therapists, teachers, and parents, and also to serve as a therapeutic and learning tool designed to stimulate social development in these children. Here we have a complex objective that involves teaching young autistics a variety of skills that most of us master, more or less fully, without any need of special education: understanding others’ emotions and reacting appropriately to affective expression, expressing our own emotions, playing with others while letting everyone take turns, imitating others, and co-operating with others. The idea of using playmate robots for therapeutic purposes came from a well-attested observation in the literature on autistic children: early intervention can help them acquire cognitive and social skills they would otherwise be incapable of developing.

This therapeutic and educational project requires a robotic partner whose social presence is at once obvious and reassuring, because its behavior is easily anticipated and understood. KASPAR is a humanoid robot the size of a small child, about three years old. Its physical appearance, in keeping with the usual interpretation of the Mori effect, is not overly realistic. Dautenhahn and her team achieved this reduction in the complexity of social communication, while also managing to avoid the complications created by excessive likeness, through an extreme simplification of facial features. The robot’s face is a skin-colored silicon mask devoid of the details that normally make it possible to determine age, gender, emotional intensity, and so forth. On the one hand, this deliberate lack of definition gives free rein to the child’s imagination, allowing him to think of KASPAR as a playmate, or at least as someone he feels comfortable being with. On