

emotional immaturity, force of habit, a state of anguish, or other mental or social factors which lessen, indeed even extenuate, the individual's moral guilt.”

Thus we can see that over time there have been huge changes in attitude toward all of these sexual practices: homosexuality, oral sex, fornication, and masturbation. Practices that were for centuries treated as very serious, even capital offenses in some of the most “civilized” countries in the world are now widely regarded as thoroughly normal and as leading to fulfilling relationships and satisfactory sex lives. The rates at which such attitude changes have come about have varied, but some of the most dramatic changes have taken only decades rather than centuries.

As with progress in so many other fields, particularly science and technology, progress in social ideas and social change is happening much faster in the first decade of the twenty-first century than it did even fifty years ago, and as with science and technology the *rates* of progress and development in social and sexual ideas are themselves increasing. This will inevitably lead to even more rapid changes in the acceptability of new sexual practices, to the point where blow-up dolls and robots will become widely acceptable within society as our sex partners. And once the sexbot bandwagon starts rolling, nothing will stop it.

### **The Cybersex Era**

In two important respects, much of the groundwork has already been laid for the sexual-robot craze to start. First, sexual awareness and experiences are now happening to our children at ever-younger ages, a side effect of the revolution in sexual behavior in the second half of the twentieth century, of the ever-increasing media coverage of sex, and of the availability of pornography and other explicit sexual material on the Internet. The average age of first intercourse in the United Kingdom has fallen from twenty-one for women born in the 1930s to seventeen for those born in 1972. And Ward Elliott, quoting a long-unpublished 1970 Kinsey Institute survey, indicates that 92 percent of married American women who were born

before 1900 were virgins at the time of their marriage, a figure that declined, on average, by about 8 percent per decade, to 30 percent for 1950s-born “disco era” women. This change is seen as even more dramatic when measured by the percentages of women who had had premarital sex, for whom the increase was almost ninefold, from 8 percent of women born in the nineteenth century to 70 percent of those born at the peak of the Baby Boom. Mirroring these changes, public tolerance of premarital intercourse has grown markedly since the 1960s. In 1969, 68 percent of the American public thought premarital coitus was wrong; this declined to 48 percent of the general population and only 19 percent of college students by 1975, a gap of only six years.

Just as the youth of today are becoming sexually active earlier than in any previous postwar generation, the age at which children first learn about sex has lowered. Nowadays if a six-year-old tells his classmate that he has just found a condom on the patio, he is just as likely to be asked in reply, “What is a patio?” as “What is a condom?” Given this trend, it is reasonable to assume that society’s attitudes on matters sexual will to a significant extent be more and more molded by the attitudes of the younger, sexually active generation.

Another development that lays the foundation for positive changes in attitude to sexual robots is the marriage of sex and technology, a union that started in the closing years of the twentieth century. One hundred years earlier, the invention of the automobile created a splendid venue for lovers lacking privacy, facilitating private assignation and fornication. And much more recently, sex has led some of the most important technological developments within the consumer-electronics industry, being, for instance, the driving force behind the boom in sales of the videocassette recorder (porn videos), then the DVD (more porn), and, of course, the Internet (yet more porn, and the first signs of interactive adult entertainment). These are examples of how social responses to technology sometimes encompass and encourage new sexual behaviors.

These two trends have fused together to create cybersex.\* — The usage of personal computers has become more and more the province of our youth, a phenomenon that will surely be repeated as handheld PDAs<sup>‡</sup> with wireless

connections to the Internet and third-generation mobile phones both become mass-market consumer items for recreational use, including sex-related use. As our youth wholeheartedly embrace such technologies, so sex will increasingly permeate through to their computer screens and the liquid crystal displays (LCD) on their hand-held devices.

### **From Haptic Interface to Sex Robot**

When the Web site [www.BetterHumans.com](http://www.BetterHumans.com) conducted a survey in February 2003 to investigate what sex technology most people desire, the clear favorite was “android<sup>†</sup> love slaves” with 41 percent of the votes polled, followed at a discreet distance by mind-to-mind interfaces with 24 percent and virtual-reality sex with 17 percent. Clearly, robots are forming a significant part of the sexual thinking of the technologically aware.

Cybersex is the latest sexual revolution, reflecting both the advances in the technologies that make it possible and the norms and play areas of contemporary sexual culture. Sex has become an activity that instead of simply requiring the physical presence of a second person now appeals to many people in newer and different forms, whether it be the opportunity to meet potential sex partners in an Internet chat room or one of the intimate activities that have been made possible through the development of dildonic and teledildonic devices. In the words of Cheyenne, an online sex-show

\*  
host, — “Technology has allowed people who may have felt repressed, guilty, unimaginative or just basically sheltered, a way to express their sexuality without boundaries and to explore different sexual worlds.”

The sexual possibilities that have been created by the teledildonic age are mind-boggling, so for many people sex today is already rather different, and the differences stem from the technologies. Among the most remarkable of these differences is the lack of a necessity to worry about AIDS and other sexually transmitted diseases, even without a condom, because, through the use of haptic interfaces, sex can now take place between lovers who are in entirely different locations—different homes in different cities, different countries and different continents.

How long it will take for the full potential of these new sexual possibilities to be widely appreciated and adopted is particularly intriguing. As William Ogburn explained in 1964, “Behavioral scientists have long recognized that emerging technology has a powerful influence on human behavior, although frequently there is a delay or lag between the emergence of the technology and the social behavioral adaptation to it.” Yet in the case of twenty-first-century sexual behavior, the lag might be minimal.

Before you get carried away with the idea that I intend to suggest that sex between two people will become outmoded, may I state very firmly that I do not believe for one moment that this will happen. What I *am* convinced of is that robot sex will become the only sexual outlet for *a few* sectors of the population—the misfits, the very shy, the sexually inadequate and uneducable—and that for some other sectors of the population robot sex will vary between something to be indulged in occasionally—when one’s partner is away from home on a long trip, for example—to an activity that supplements one’s regular sex life, perhaps when one’s partner is not feeling well or not feeling like sex for some other reason.

The modern era of expanding sexual freedom that began with the sexual revolution of the 1960s takes place in cultural environments typified by dynamic change and increased levels of social tolerance. Commenting in 1978 on some of the effects of this freedom on our view of what is normal in relationships, Maxwell Morris wrote:

The dawning of a new idealism has given vent to increased sexual vigor and freedom among both sexes. The changing panoramic scenario of sexual liberation may, for example, be illustrated by the increasing number of non-traditional “experiments in living.” Innovative living arrangements inclusive of the open marriage, group marriage, unmarried sexual cohabitation, and homosexual cohabitation offer a redefinition of the term “meaningful relationship.”<sup>13</sup>

Some of the effects of this same freedom on the sexual aspirations and fulfillment of the individual are described by Dennis Peck in terms of an increase in the potential of our sexual pleasure: “Individual fulfillment

through various sexually related activities has resulted in a greater emphasis upon recreational sexual expressions.” So in the case of technologically driven sexual practices, the ideas are already with us, even in advance of the general availability of the equipment that will turn these ideas into reality.

In the previous chapter, we discussed some of the haptic interfaces that make computer-driven sex a reality. Now consider this: Assume for a moment that instead of a newly found human lover being at the other end of an Internet link with their own haptic interface, engaging with you in whatever sexual activities your respective hearts desire, there is instead a robot, a sexual robot programmed with the knowledge of countless experienced lovers and all of the world’s sex manuals. Would you know the difference?

I believe that this test will be relatively easy for robots to pass, given that the physical feeling you experience will be based on a combination of the physical characteristics of your haptic interface and the skills of your lover. If sex-at-a-distance is physically enjoyable with another person, why does it have to be any less enjoyable if that person is replaced by a robot, as long as the physical connection at your end, your haptic interface, is the same? And if you can enjoy sex-at-a-distance with a robot, then why should you not equally enjoy face-to-face (or however) sex with a robot whose embodiment incorporates all the artificial genitalia and other physical characteristics of your favorite haptic interface, with the added benefits of arms to hold you tight, hands to caress you, and a sexy voice to whisper in your ear? In this transition—from haptic interfaces for human-human sex-at-a-distance to haptic interfaces for human-robot sex-at-a-distance to human-robot sex period—we can see how easy it will be for many people to be converted to the idea of robot sex.

While discussing the physical characteristics of sexually appealing robots, we should not forget the benefits that twenty-first-century design and manufacturing technologies will very soon be bringing to sex dolls and somewhat later to sexbots, benefits that will allow the purchaser or hirer to specify the physical characteristics of the product’s genitalia. Women for whom size matters will be able to demand for their malebot any girth and length of penis they desire, while men will be able to choose a fembot’s

vaginal dimensions to be as tight or as cavernous as they wish. And, of course, on the deluxe models, these dimensions will be changeable with the press of a button, or even by murmuring the right words in the robot's ear. These physical characteristics will represent only some of the popular user features that will be designed into sex robots. Others include all the knowledge in the *Kama Sutra* and similar books, and in the famous Japanese paintings of sexual positions. Just as chess programs are loaded with databases of moves in different chess openings, so the robots can be given databases of different sexual positions and techniques from around the world. It will be possible to set different "levels" or "preferences," in much the same way that different skill levels and style-of-play preferences can be chosen on a chess computer. And the robots will be able to learn what the user likes. On one level a robot could be set to cater, in every encounter, to the user's sexual tastes. Another level could allow for a random choice of sexual activities and/or positions, in order to give the user some surprises. Yet another level could be a "teaching" mode that provides instruction for the sexual novice. By providing a host of different options, manufacturers will make sex robots appealing to just about every sexual orientation and taste.

### **Are Men and Women Different?**

Sigmund Freud might have foreseen robot sex as a serious possibility. He used to explain in his lectures that when we dream about complex machines, they always signify the genitals, an explanation that might lead us to speculate that he would have regarded robot sex as little more than the practical implementation of this phenomenon, the replacement of a partner's genitals with the artificial genitals of a machine. If Freud had indeed considered this possibility, how would he have assessed the appeal of sexual robots to men and to women? Would he have predicted that men will be more attracted than women to the idea, or vice versa, or that there would be little or no difference to the sexes in the appeal of sexbots?

There are two major parts to this question. First, do men in general and women in general differ in their sex drives? Second, will men and women be equally likely to embrace the technology of sexual robots, or will men

want sex with fembots more than women will want sex with malebots, or vice versa, or any other combination thereof?

The first question is one that has long spawned huge differences of opinion among laypersons and psychologists alike, ranging from William Acton's widely quoted pronouncement in 1857 that "the majority of women (happily for society) are not very much troubled with sexual feeling of any kind," to Barbara Ehrenreich's 1999 article in *Time* magazine, in which she revealed the equally astounding news that woman, not man, is destined to be "the sexual powerhouse of the species." To add to the confusion caused by the highly contrasting views of individual "experts" such as these, four leading textbooks on the subject have innocently combined to create even more doubt as to the truth of the matter: *Our Sexuality*, by Robert Crooks and Karla Baur, is dismissive of the stereotypical view of men as having higher sex drives than women; *Human Sexuality*, the famous tome based on the work of William Masters and Virginia Johnson, acknowledges the existence of the stereotypical view but without coming down for it or against it; *Sexual Interactions* by Albert Allgeier and Elizabeth Allgeier also sits squarely on the fence on this issue; while in *Understanding Human Sexuality*, Janet Hyde and John DeLamater explored the possibility that women might have a higher sex drive than men but failed even to discuss the possibility that the reverse might be true.

It was not until recently that the psychology literature could boast what appears to be a definitive answer to the question, when Roy Baumeister, Kathleen Catanese, and Kathleen Vohs conducted an extremely comprehensive study based on more than 5,400 articles and papers in learned journals and conference proceedings, all of which contributed perceptions on sexual motivation, drive, and desire. Baumeister and his colleagues focused specifically on the desire for sex for its own sake, which is linked very closely to sexual enjoyment—the amount of pleasure we derive from sexual activity.

Baumeister and his group assessed sex drive in terms of the desired frequency of sex, the desired variety of sex acts and partners, the frequency of fantasizing about sex, the frequency of masturbation, the actual number of partners (as opposed to the desired number of partners), the frequency of

thinking about sex, the willingness to forgo sex, and the willingness to make sacrifices in other spheres in order to obtain sex. Having surveyed the broad range of available evidence on the relative strength of sex drive in men and women, evidence that was extensive and that came from the diverse methodologies employed by thousands of research psychologists, they came to the following conclusion:

By all measures, men have a stronger sex drive than women. Men think about sex more often, experience more frequent sexual arousal, have more frequent and varied fantasies, desire sex more often, desire more partners, masturbate more, want sex sooner, are less able or willing to live without sexual gratification, initiate more and refuse less sex, expend more resources and make more sacrifices for sex, desire and enjoy a broader variety of sexual practices, have more favorable and permissive attitudes towards most sexual activities, have fewer complaints about low sex drive in themselves (but more about their partners), and rate their sex drives as stronger than women. There were no measures that showed women having stronger drives than men.<sup>14</sup>

But as Baumeister and his colleagues are quick to point out, this overall conclusion

does not mean that women do not enjoy sex, nor does it mean that women do not desire sex. It certainly does not mean that women should not desire sex or that they should feel guilty over sexual desire or pleasure.... Our conclusion is merely that on average men desire sex more strongly and more frequently than women.

One of the reasons for this disparity is undoubtedly the overzealous sexual demands placed by many men on their women, demands that fail to take into account, for example, the levels of fatigue experienced by many mothers due to their child-care roles, especially if they have jobs as well. Where there is a sexual imbalance in the sense of desired frequency, a robot could be the perfect solution for the enlightened couple.



Let us now address the second of our questions with which we started this discussion: Will men and women be equally likely to embrace the technology of sexual robots? On the basis of Baumeister's conclusion, it would be natural to expect that many more men than women will be enthusiastic about the idea of robot sex and more likely to become customers when sexual robots are on the market at affordable prices. And because technology in general is accepted more slowly by women than it is by men, it might seem likely that women will be slower than men to investigate most aspects of the technology of sex, including sex with robots. On the other hand, the use and history of vibrators and their staggering sales figures suggest that once robot sex gets some good PR from women, this bias will be dramatically reduced and possibly eroded entirely.

Another factor that might increase women's motivation for robot love and robot sex is the recent increase in unwillingness on the part of men to marry. It seems that since men are able nowadays to get sex much more easily than twenty or even ten years ago, they hesitate entering into long-term relationships. This trend will leave a lot of women faced with the prospect of a human lover uncommitted as to the long term. Instead many women might prefer to engage with a sexbot—always willing, always ready to please and to satisfy, and totally committed. This ever-availability of malebots could bring about a dramatic and positive change in the parameters of human love relationships, not necessarily for more sex but rather for sex at the right time.

### **When They Look Like Us**

Some people will find it relatively easy to get used to the idea of robots as surrogate humans and alternative sex partners. In general I would expect these to be the technologically aware, those who grow up hand in hand with technology, those whose doubts and questions will relate more to what robots can and cannot do than to their appearance. This sector of society will find pleasure and excitement in exploring the capabilities of robots, including their emotional capacities, their personalities, and their sexual proficiencies and preferences.

Others—possibly because of deep reservations, possibly because of prejudice, possibly because their outlook is so literal that they will need to see realistic humanlike robots before they can come to accept the concept of androids as pseudo peers—will take a lot more convincing. And to convince them, the appearance of the androids will be almost as important as, if not more important than, their technical capabilities.

We have already discussed the general perception among Japanese robot designers, even as far back as the eighteenth-century creators of the *karakuri* tea-serving dolls, that to elicit the most positive reactions from humans, such creations should be humanlike in appearance. This perception can be seen in the way that the Japanese robots of today are increasingly endowed with the physical characteristics of humans. And as the number of domestic robots worldwide grows dramatically, from about 400,000 in 2003 to the UN’s prediction of 4.1 million in 2007, so the numbers of robot designers, robot-development companies, and robot-research institutes will mushroom, all fueled by a combination of the money earned from robot sales and government mega-investment. This massive research-and-development effort will rapidly lead to the creation of androids so humanlike in appearance that from a few feet away almost no one will be able to tell the difference. In my view these “waxworks as androids” will be utterly convincing in both their appearance and their movement by 2020, if not sooner.

At the Expo 2005 world exposition in Japan, Hiroshi Ishiguro, a robotics professor at Osaka University, unveiled the most human-looking robot yet. Ishiguro’s previous version was called Repliee R1 and had the appearance of a five-year-old Japanese girl. It was made of hard plastic, its head could move in nine directions, and it could make gestures with its arms. The exposition’s 22 million visitors, 95 percent of whom were

Japanese, were able to see his 2005 creation, Repliee Q1.\* — She has skin made of a flexible silicone material rather than hard plastic, covering a complex system of forty-two actuators† located in the upper part of her

body and powered by an air compressor, allowing the gynoid\* — to turn and react in a humanlike way. Repliee Q1 can flutter her eyelids, she appears to breathe, she can move her hands just like a human, she is responsive to

human touch, and she can mimic the human behavior of slightly shifting her position from time to time.

Professor Ishiguro was not under any illusions in 2005 that Repliee Q1 would in its present form pass for a human. But he did believe that that stage in the acceptance of robots will soon be possible. “An android could get away with it for a short time, 5 to 10 seconds. However, if we carefully select the situation we could extend that, to perhaps 10 minutes. More importantly, we have found that people forget she is an android while interacting with her. Consciously, it is easy to see that she is an android, but unconsciously we react to the android as if she were a woman.”<sup>15</sup>

Just by looking at Repliee Q1 and comparing her with the stereotypical image of robots as laboratory prototypes, complete with wires and parts hanging out, we can see how quickly progress is being made in this field in Japan. As the android technology of the future combines with developments in haptic sexual interfaces, the first sex robots will start to appear on the market. This might happen as a result of commercial collaboration between the manufacturers of products such as RealDoll and the laboratories in Japan that are leading the way in android research and development. Or it could happen that the Japanese themselves decide they do not need any such collaboration and that, by the way, the “Dutch wives for hire” businesses should be major contributors to robot research budgets. Either way, I do not believe it will be many years before the latest announcements from Japanese robot researchers talk of robots as sex partners and start to demonstrate such capabilities. Why not? The technology necessary for orgasm has been around for a while in the form of the vibrator, and more recently as the Thrillhammer and other similar machines. Think back for a moment to Net Michelle’s orgasmic experience, created by Thrillhammer

\*  
via a teledildonic interface.— How long can it take for the necessary fusion of technologies to occur?

As the first sexbots reach the market, the publicity for robot sex will take off with a bang. Initial news reports will most likely treat sexbots as a curiosity item, but this will not prevent their existence from becoming widely known. Very quickly, soft-core porn sites and Internet chat groups will start to display and discuss sexbots in action. As more and more people

rush to their computer screens to watch others enjoying sex with robots, and as increasing numbers of sexual experimenters are interviewed by a medium anxious to publish all the voyeuristic and vicarious details of the thrills and joys of robot sex, so the mainstream media will stop blushing and cash in on the act. Just as *Marie Claire* published an article in 1994 on the almost unthinkable idea of women paying for sex and enjoying it, so the women's magazines of 2014, if not earlier, will, I am certain, be publishing articles on women's experiences in enjoying sex robots. The semiprivate, semipublic exhibition of teledildonics that took place in 2005 at the New York Museum of Sex can be seen as a pioneering media event in this field. Only a few were able to be present in New York that night, or at the other end of the teledildonic line in San Francisco, but the event was reported in the online version of *Wired*, the highly respected, leading-edge high-tech magazine with a print circulation of more than half a million copies. When such events attract increasing amounts of attention from the mainstream media, albeit as curiosities at first, the idea of sexual robots will quickly spread. The first sexbots to reach the market will be too expensive for most to buy, or even to hire, so for a while these products will be restricted to the upper socioeconomic groups. But this was also true in the very early days of "home cinema" and in the early days of AIBO—Sony's robotic dog. As the media interest in robot sex grows, more people will try the experience, buying and hiring sexbots in numbers sufficient to bring down prices, thereby making sexbots available to men and women from a broader economic spectrum.

### **Sex Robots for Hire**

While much of the initial fascination with sexbots will be prompted by curiosity, it is reasonable to expect some interest to stem from advice given by therapists to their patients. People experiencing psychosexual problems will no longer need and lack the services of human sex surrogates—they can instead be referred to clinics where the surrogates are robots. This does, of course, raise all sorts of ethical and legal questions, especially in the litigious climate of the United States, but setting legal problems aside (and they will exist on a much smaller scale, if at all, in many countries), it

seems to me inevitable that sex robots will be employed for therapeutic purposes.

This naturally raises the issue of cyberprostitution. The johns and janes who pay for sex benefit in various ways from their encounters with prostitutes (one form of sex without human love), so they will equally benefit in various ways from sex with robots (another form of sex without human love). And robot prostitutes might become a popular method for people to learn sexual technique before entering into a human relationship. With a robot prostitute, the control of disease is implicit—simply remove the active parts and put them in the disinfecting machine. Cyberprostitutes, on the basis of the fees received for their services, could play an important role in the growth of the robotics industry and the ability of this industry to continually develop more advanced products. Certainly, there are some questions to be answered by the lawmakers of the future regarding robot prostitution. Should it be illegal to have a bevy of robot prostitutes (a robot brothel)? Why should it be, since all current laws apply only to human prostitutes? And if such commercial transactions *are* made illegal, will the Mafia attempt to control the manufacture of sexbots, spreading their availability and making them a source of huge revenues?

### **What Will Our Sex Lives Be Like?**

There are obvious social benefits in robot sex—the likely reduction in teenage pregnancy, abortions, sexually transmitted diseases, and pedophilia. And there are also clear personal benefits when sexual boundaries widen, ushering in new sexual opportunities, some bizarre, others exciting. In “Impacts of Robotic Sex,” Joe Snell pointed to various ways in which robot sex could alter human relationships and human sexuality:

Techno-virgins will emerge. An entire generation of humans may grow up never having had sex with other humans.

Heterosexual people may use same-sex sexbots to experiment with homosexual relations. Or gay people might use other-sex sexbots to experiment with heterosexuality.

Robotic sex may become “better” than human sex. Like many other technologies that have replaced human endeavors, robots may surpass human technique; because they would be programmable, sexbots would meet each individual’s needs.<sup>16</sup>

An important aspect of human sexuality is the possibility of failure or denial, making sex and the enjoyment of it somewhat capricious. In order to be better than human sex, the performance of sexbots might need to contain those subtleties of human sexuality that will enable them to mimic this capriciousness. Things that are always great can become boring, but the anticipation, doubt, and hope of each sexual experience can be instilled in their human owners if the sexbot is designed with these subtleties.

There are many professions that call for being absent from one’s sex partner for varying periods of time. Robots can be the perfect substitutes in these situations, satisfying one’s sexual needs without creating any cause for concern about disease and fidelity. For sailors, who a century ago would

have been traditional customers for *dames de voyage*,\* — a charming female robot would be a great alternative to masturbation or a visit to the local brothel when ashore. Ships’ pursers will perhaps be loaning them out like library books, instead of administering penicillin jabs for the needy.

There are many other situations in which a sexbot would be the ideal solution. For those who lose a spouse or a long-term partner, whether to illness, death, or as one of the casualties of a broken relationship, robots could provide the answer. As one ages, it becomes clear that maximal sexual intimacy sometimes takes a very long time to evolve—years, even—and that it redefines itself along the evolution of a loving relationship. Robots will be able to achieve this evolutionary process more quickly than humans, by retaining all the memories of living with their human other, analyzing the relationship characteristics exhibited by their human, and by themselves studying huge databases of relationships and how they are affected by different behaviors, then tuning their own behavior to the needs of their human mate. Humans often do not know what they really want or need, so intuitive robot sex partners are a real requirement, able to discern

whether their owner really wants sex or would prefer a nice glass of wine or a walk in the park.

Thought-provoking? Certainly. But far-fetched? Not at all.