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**The Artificial Human. Fear, Fiction and Fact.**

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The first artificial human – how could it have been otherwise? – was a woman. Pandora's origins – for it is she we are talking about – are variously related in classical Greek literature. Strictly speaking she was not artificial at all, but real. However, she was fashioned in a way later reserved for artificial human beings. She was, so the legend goes, the first woman born of Earth, and from her all later women were descended. According to Hesiod (c. 700 BC) it was the blacksmith god Hephaistos – other sources prefer the potter god Prometheus – that fashioned Pandora out of water and clay and afterwards hardened her in fire. Other Olympians gave her a fine skin and clothing, charm and attraction in abundance, and golden hair. Pandora was thus assembled like an automaton – albeit not by men but by gods. Unfortunately this first woman did not do well by the world of men. It was the god Hermes who gave her the gifts of "importunate flattery and guile"; so because of her charm men were obliged to love her, but because of her wiles they were doomed to embrace in her only their own misfortune.

Seven hundred years later, at the beginning of the Christian era, Roman literature records the creation of another artificial woman – this time not from the hands of gods but of a man, an artist. It is of the Cypriot sculptor Pygmalion that Ovid in his *Metamorphoses* tells that he carved a statue out of ivory. As a misogynist he abhorred real women for their malicious inclinations and spiteful deeds – the destructive spirit of Pandora, one notes, lives on. But Pygmalion's artificial woman was sadly no more than a lifeless statue until the goddess Venus took pity on the poor artist and breathed life into her, whereupon he could unite sexually with her.

So far as the history of ideas is concerned, this ivory statue is the source of all later automata that could move and even speak – though that took quite a long time. It was not until the 18<sup>th</sup> century that engineers succeeded in constructing an automaton that was able to move its limbs and utter indistinct sounds – though it could not yet walk. As Dr. Roßbach is going to speak about these automata, I shall mention only a few names – Vaucanson’s “Fluteur” (or flautist), Jacquet-Droz’s writing androids and Baron von Kempelen’s speaking human machines.

A few decades later European Romantic literature took up these ideas. In his story “The Sandman”, E.T.A. Hoffmann has a lovesick student lose his heart to a doll, Olimpia, who takes the form of a living creature when he vitalizes her with his own life-fluid. But the fluid – a borrowing from Mesmer – vanishes in the moment when the student sees the doll destroyed before his eyes. For in their quarrel about their own share in her creation, the physicist Spallanzani and the optician Coppola have torn her to pieces.

Hoffmann’s story, like Mary Shelley’s later *Frankenstein* novel, warns against the hubris that makes man act like a god, desiring, as a ‘secundus deus’, to create in his own image. This blasphemous undertaking revenges itself on its perpetrator when the maker either perishes or loses his mind. Accordingly, one might say that the prototype of the mad scientist was invented by Mary Shelley at the beginning of the 19<sup>th</sup> century.

By the end of the 19<sup>th</sup> century ideas about artificial human life had again changed, and the human automaton began to embody a technological Utopia that celebrated the triumph of the scientific age. Thus in Villiers de l’Isle-Adam’s novel *L’Ève future* the engineer Edison creates a copy of a human being in comparison with which Vaucanson’s and Jacquet-Droz’s constructions were indeed primitive. Several chapters are devoted to the android’s electromagnetic mechanism, and the chapter “Rosy lips and teeth of pearl” explains how the scent of roses that is said to issue from the lips of

a beautiful woman can be produced with chemicals. The android can even speak, for Edison has replaced her lungs with two golden phonographs on which texts of contemporary writers and philosophers are recorded. Unfortunately this “Future Eve” is so dim that she hardly understands a word she utters.

These late 19<sup>th</sup> century androids can, I think, be seen as the intellectual predecessors of the robots that Prof. Knoll will be talking about later. Artificial humans have only been called robots since the 1920s. The Czech writer Capek introduced the term in his drama *Rossum's Universal Robots*. In Czech *rozum* means understanding or intelligence and *robota* means forced labour. So the title *Rossum's Universal Robots* could be rendered as “intelligent work-animals” or “universal slaves”.

European literature and philosophy evince, however, not only artificial humans made of inorganic materials such as wood, metal, wax and chemicals – the organic creation of androids also boasts a long tradition. Extra-corporal – or *in vitro* – fertilization is based on ideas developed in the first half of the 16<sup>th</sup> century, when the German medic Paracelsus sought to produce ‘homunculi’ (‘little men’) by means of alchemy. The process consisted in keeping human sperm in a closed glass vessel for 40 days “in ventre equino” – which meant in warm horse dung. Slow putrefaction would ensue, and from this the new life of the homunculus would develop. The embryo, for which no female principle, no ovum, was necessary, had to be fed during these 40 days – or other sources say 40 weeks – with the “arcanum sanguinis humanum”. What this “quinta essentia” or quintessence of human blood actually was is something about which Paracelsus’s *De rerum natura* is silent. Because the embryo develops outside the body of a mother, it remains “far smaller” than a normally born human. Paracelsus, one realizes, was none too clear about the biological processes of human conception and gestation. Today we understand that an ovum is also required, and that an extra-corporally produced embryo cannot be simply inserted in a pile of warm horse dung, but must be implanted in the womb of at least a surrogate mother.

Alchemical experiments combined in the strangest ways with modern electro-physics also featured in English Romanticism. In the early 19<sup>th</sup> century Mary Shelley's *Frankenstein*, already mentioned above, describes the creation of an artificial man from the members of a corpse galvanized into life by means of an electric current. The author ironically calls her Frankenstein, the scientist who conceives this experiment, a "modern Prometheus", playing on the ancient myth in which Prometheus, as a punishment for his technological innovations, was chained to a rock in the Caucasus, where an eagle daily flew by to eat a portion of his liver. Mary Shelley has a similarly unattractive end in store for her Dr. Frankenstein.

At the end of the 19<sup>th</sup> century H. G. Wells, in his *Island of Dr. Moreau*, depicts the vain attempts of a crazed Darwinist to transmute – or transmutilate – wild animals into men by surgery. This involves performing complex grafting operations – without anaesthetic – on pigs and hyenas, for example, until a quasi-human being arises. In Moreau's laboratory, the "House of Pain", ox-men, dog-men, leopard-men and ape-men are produced in this way; and in a play on the Utopian idea of the "noble savage" – the 18<sup>th</sup> century Rousseauistic ideal of a natural man uncorrupted by civilization – Wells ironically names Moreau's retreat "Noble's Island". Wells was unaware that cells with different chromosome structures could not grow together, or that blood transfusions between hyenas and pigs would elicit immune reactions. But in any case the attempt to prove Darwinian theory by surgery – to assemble a human being from the parts of various animals – does not succeed, and Moreau's creatures slowly resume their animal natures, walking on all fours and losing the power of articulate speech. The eccentric Darwinist has to admit that animal flesh is more stubborn than his surgical arts.

Closer to medical possibility is the *Brave New World* of Aldous Huxley. Published in 1932, Huxley's anti-Utopian vision is set in the year 632 after Ford – that is to say in AD 2540, 632 years after Henry Ford's "Model T" went into production in

America. This date (1908) had replaced the birth of Christ as zero-year in the computation of time. In Huxley's "brave new world" not just motor vehicles but human beings are produced on the assembly line. In vast breeding factories ovaries are permanently immersed in sperm to yield fertilized ova, and the embryos so generated are graded into five different classes of human beings, the alphas, betas, gammas, deltas and epsilons. The alphas have the highest intelligence; the epsilons are conditioned to become scarcely more than semi-idiotic work-animals. Genetic engineering permits perfect control of the selection process. Future alphas are given a high oxygen ration in their feeding bottles, whilst the epsilons receive only 70 percent of normal human needs.

Huxley's dystopic caricature of industrial society envisages the single-minded manufacture and conditioning of men and women for their future function in the social machine. The goal is not just smooth functioning, however, but also the subjective happiness of the creatures so produced. This is ensured on the one hand by "hynopedia" in infancy, on the other by the drug "soma", administered at a later stage to iron out any shortcomings in the processes of genetic engineering and psychological conditioning. In other words the entire population of the "brave new world" is on drugs. These combine the pleasant effects of alcohol and mescaline, transforming disagreeable and debilitating moods and feelings into sensations of well-being and pleasurable hallucinations.

Huxley's message is that scientific and technological progress will end in a new form of slavery – that of a synthetically pacified and satisfied world where evil, ranging from individual unhappiness to war, can be avoided by a combination of genetic engineering, psychological conditioning ("hynopedia") and drugs. His "brave new world" – an ironic quotation from Shakespeare's "Tempest" – portrays a totalitarian society such as he saw rising around him in the early decades of the 20<sup>th</sup> century. Huxley's travels in America, the reports he read of Stalinist Russia and his experiences of

European fascism during a seven year stay in Italy all contributed to the genesis of his novel.

Professors Eulert, Klein and Passarge will, I am sure, be able to tell us the extent to which this disturbing vision of the future lies within the bounds of medical possibility.

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