Putting the ‘me’ in mechanical: lessons from the mechanical men of health 1928–1948

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ABSTRACT

During the interwar years, health exhibitions and pavilions were commonplace in Europe and the USA. Within these exhibitions were a small number of life-sized or oversized mechanical men used to represent physiological processes. Although they received significant press attention at the time, little academic analysis exists to date. These mechanical men, I argue, all provide important insights regarding the way design could be used to heighten the appeal of physiology and crucially, in the formation of a new term—the Accessible Body.

First, this study re-introduces three mechanical men of health to an academic audience, identifying provenance and unearthing key details of their performance and visual appearance. I argue that there is much to be gained by their analysis in comparison to the more notorious body representations that they orbited. Through detailed analysis of their forms, the three mechanical men are shown to challenge the dominant notions of the Ideal Body and Fordist Body embodied in the Dresden Transparent Man (1930) and Der Mensch als Industriepalast (1926), respectively. The study examines and classifies these mechanical men as a new type of body—the Accessible Body. This term refers to representations that embody a sense of consciousness, the re-appropriation of popular culture and engagement with humour and visual appeal.

The study concludes with discussion about the Accessible Body in contemporary health education. What tropes and approaches may remain significant today? By leaning on contemporary thinking about linguistic rather than visual metaphors in health, this study concludes with provocations for the alignment of other appropriate metaphors within a mechanical man and Accessible Body framework. Ultimately, I call for a reshifting of man/machine visual metaphors as a means of re-engaging the audience today.

INTRODUCTION

During the first half of the 20th century, a plethora of health exhibitions were displayed throughout Europe and the USA.1–5 The interwar years, in particular, saw a range of commercial and governmental interventions designed to improve the health of its people, driven by the need for a strong workforce and healthy society. There was an enormous economic investment ploughed into exhibitions and fairs in the interwar years, particularly in the UK, Germany and the USA.6 The rise of modernism, and its attempts to optimistically rebuild society through new architecture, design and new health discourses, was also vital in shaping attitudes to health education and representations of healthy bodies.7 This was particularly the case in Germany and Central Europe. Within 1920s Britain, a shift from infectious to chronic disease and the perceived need to promote personal action in response to public health issues saw a rise in new health-focused councils and societies (such as the Health and Cleanliness Council,8 the Central Council for Health Education9 and The New Health Society10). Health education aimed at the lay audience became more widespread during the interwar years with the proliferation of health-related publications, films and exhibitions.9 10

The general visual richness and pervasiveness of the health exhibitions during this period have been well documented and discussed.1 2 6 11 12 Less analysed in detail, are the three-dimensional, life-sized or oversized animated men that populated the exhibition space alongside the visitors. This paper examines how these mechanical figures were used to represent physiology in the interwar years, identifying their provenance and how were they received in the popular press. Three mechanical men were identified as a basis for new academic analysis and discussion. They were identified as follows: Rupert (1928–1930, UK), who was most prominently shown at the Schoolboy’s Exhibition in 1928 and 1929, The Marvellous Mechanical Man (1933, USA), shown during the Chicago World Fair and Godfrey (1938–1948, UK), who was displayed at various exhibitions in the UK and the New York World’s Fair. All three mechanical men were designed to be viewed by a lay audience (given the non-specialist nature of the exhibitions in which they were displayed) and were designed to communicate the workings of the human body with particular foci on digestion, nerves and the brain. They were also designed to promote healthy diet and exercise, in line with health education at the time more broadly.9 10 They were selected for study due to the significant press coverage they received during their display, their shared performativity and their classification within popular texts as ‘mechanical men’ of health education. The three exhibited mechanical figures were classified and named as male by the organisers and journalists of the period, thus establishing the male dynamic body as the norm, in this particular genre at least.

The central argument in this paper is that an alternative approach to representing physiology emerges from the study of these three mechanical men, beyond the already recognised tropes outlined below. Through detailed description and subsequent analysis of their forms, it is argued that the three mechanical men offer a new type of

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body image from the interwar years for the scholar to consider afresh—the Accessible Body.

The Ideal and the Fordist Body

In order to understand how the conceptual representation of the exhibition body is extended by the three mechanical men, it is vital to first outline the mechanical men’s more renowned contemporaries. There were two notable and dominant physical models of the body displayed during the interwar years in Europe and the USA: The Dresden Transparent Man (DTM) (1930) and Fritz Kahn’s large scale image ‘Der Mensch als Industriepalast’ (illustration (1926) and mechanical model (1935)). Scholars recognise these models as significant visual representations in 20th century health communication and head raised to heighten drama. Its form created a tension in Dresden, Germany in 1911. The healthy body as an idealisations can be attributed to the International Hygiene Exhibition of the Nazi regime.17

The DTM represents an Ideal Body—unblemished through its display at the 1935 Health Exposition in Berlin. Klein-schmidt, an American author, described the transparent man’s display within a special room as a ‘a sanctuary’, whereby the viewer can appreciate ‘the sheer beauty of the human body’. The figure was also accompanied by a quotation by St Augustine claiming that of all the wonders of the world, man is the most wonderful.12 Today as then, it physically remains, thanks to its transparency and perfect proportions, untouched by its time aesthetically. It is form robbed of fashion. It is also, to some extent, a highly veristic body, although sanitised and indeed romanticised through use of colour and dramatic lighting. Due to its evocative form, it was commissioned repeated across the world and it is still on show in various locations today.

As an alternative to the Ideal Body, a Fordist Body was embodied in ‘Der Mensch als Industriepalast’ (1926), a notable image of physiology also from Germany. In 1926, Fritz Kahn published an almost life-sized poster of ‘Der Mensch als Industriepalast’ (known subsequently here as ‘Der Mensch’) as a supplement to the final volume of this book series ‘Das Leben des Menschen’. It was designed by Fritz Schüller. Kahn’s previous books featured varied visual metaphors and styles for representing physiological processes. ‘Der Mensch’ however presented a large-scale and unified vision of the machine body. Its novelty stemmed from an immaculate visual rendering of the staged action of miniature people (or homunculus) operating machinery within the body. Man ultimately remains at the centre of the image, positioned as creator of the machine-parts that, in turn, creates the body machine. See Sappol for more on this particular paradox. The version of ‘Der Mensch’ from 1926 would be widely reproduced, translated and commercially available from the early 1930s. A second version, a commercially available wall chart of ‘Der Mensche’, (1928) designed by Ottomar Trester was much simplified, presumably for more public display. For the purposes of this study, the original version from 1926 will be used for later analysis since this was most likely of larger influence given its translation.

‘Der Mensch’ stands as an exemplary example of a Fordist Body, to use Emily Martin’s term. Although Martin herself never applied the Fordist Body term to ‘Der Mensch’, it is difficult to imagine a more visual precursor of Martin’s term. The Fordist Body was defined by Martin as a body whose organisation was based ‘around principles of centralised control and factory-based production’. She argued that the positioning of the body as one that aimed to produce a standardised product (him/herself) through the use of standardised parts and processes was ethically problematic in the late 20th century. The label of the image itself—‘Man as Industrial Palace’ or ‘The Human Factory’ (in the English Translated Version, 1931) reflects a Fordist origin and the careful construction of the factory (or chemical plant) ensures that every vital ‘station’ is manned and monitored. Sappol also clearly makes a connection between the positioning of factory work at the time and how this image would be viewed as aspiring to a utopian vision of the body in Germany. Reflecting the Fordist ideal—the utopian vision of efficiency—Sappol observes how Kahn’s image is a highly idealised version of the factory avoiding a suggestion of potential accident, grime, grease or the stench manifest in the harsh realities of factory life. This sanitisation could be very much seen as echoing the efficient factory metaphor applied to the digestive system by Pavlov in 1894. This Fordist Body is a form of Body Ideal, but one very much situated in a particular time and place (the post-World War I Weimar Republic).

Vogel positions these early exhibits as offering aspiration to the viewer, partly through their perfectly preserved and aesthetic sensibilities and inevitably the removal of the ‘flesh’. A breakthrough in terms of the application of transparency was evident in the display of a full Transparent Man in 1930, at the Deutsches Hygiene Museum. This life-sized exhibit was formed from transparent plastic that enabled the encasing of a real human skeleton with casts of veins and arteries on display. The result was a dramatic celebration of man, without obvious metaphor. Although the transparent man did not move, as such, he was electronically driven, using light timers and sound to bring the body to life.

The rhetoric that accompanied the DTM at the time was celebratory in nature highlighting the wonder of man. In an account of its display at the 1935 Health Exposition in Berlin, Klein-schmidt, an American author, described the transparent man’s display within a special room as a ‘a sanctuary’, whereby the viewer can appreciate ‘the sheer beauty of the human body’. The figure was also accompanied by a quotation by St Augustine claiming that of all the wonders of the world, man is the most wonderful. Today as then, it physically remains, thanks to its transparency and perfect proportions, untouched by its time aesthetically. It is form robbed of fashion. It is also, to some extent, a highly veristic body, although sanitised and indeed romanticised through use of colour and dramatic lighting. Due to its evocative form, it was commissioned repeated across the world and it is still on show in various locations today.

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These two well-known and well-discussed visual models of physiology represent two key visual tropes. On the one hand, the DTM aligns the brightly lit internal organs and upward posture of the body to notions of perfection, wonder and aspiration from a heavenly source. On the other hand, ‘Der Mensch’ likens the body to a factory of efficient production. These two bodies have excited scholars partly due to their political and social resonance though I argue, in the following paper, that there are equally novel, relevant though hitherto neglected mechanical men that orbited DTM and ‘Der Mensch’ that offer a further body trope.

Analytical context and structure
This study is very much situated within the field of Material Culture. The underpinning premise of Material Culture is that objects reflect, consciously or unconsciously, directly or indirectly, the beliefs of people who made, commissioned, purchased or used them, and indeed the belief system of the society or community to which they belonged. As such, it permits critical engagement with materiality for understanding important issues, including new kinds of bodies. The mechanical men in this study are examined as a source of primary data. They are not merely machines but constructors of meaning and thus are here considered from an autobiographical standpoint including their provenance, performance, journeys and reception. As objects the mechanical men were not for personal purchase but for temporal visual and aural consumption and thus are very much reflective of the beliefs of the education or persuasive system that constructed them—in this case, the need to shift responsibility for bodily health to the individual.

This study adopts Prown’s methodology of Material Culture consisting of description, deduction and speculation, and this comprises the physical structure of the paper.

First, the three mechanical men have been objectively described in terms of physical appearance, operation and modes of performance, drawing on extensive source material from the time, including exhibition documents, promotional material and newspaper articles. The exhibit is a problematic artefact given its transience and temporary state. No full scripts for instance, of the mechanical men, could be located at the time of writing and much of the mechanical men’s stories are pieced together from triangulation of journalistic reports, close readings of photographic evidence and from exhibition documents from the time. Information regarding how each mechanical man came to orbit the transparent man and/or ‘Der Mensch’ is also included.

Second, common properties present within the artefacts’ descriptions are analysed further and positioned as forming the Accessible Body. This term is discussed deductively against the contemporary body representations of the Ideal and Fordist bodies introduced above. Finally, the conclusion speculates about the future of the mechanical man and the man/machine metaphor. By leaning on contemporary thinking about linguistic rather than visual metaphors in health, this study concludes with provocations for the alignment of other appropriate metaphors within an Accessible Body framework.

INTRODUCING THE MECHANICAL MEN OF HEALTH
Rupert, Schoolboy’s Exhibition, London (1928–1930)
Rupert was first displayed between 29 December 1928 and 5 January 1929 at the Schoolboy’s Exhibition at the New Horticultural Hall in London (figure 1). A second version, with slightly altered innards, Rupert II was shown in the same exhibition the following year from December 1929 to January 1930. The Schoolboy’s Exhibition (also known as the Schoolboy’s Own Exhibition) was a regular exhibition that focused on educating boys about science and technology and broader topics such as sport and leisure. The exhibition was designed for the ‘interest and amusement’ of boys aged 6-18 years and existed for several decades into the 1960s, with various title changes. It was a significant educational event for British children, was well documented by news agencies such as British Pathé and later would tour to other major cities in the UK. Cecil Stratham Schofield, the organiser of the exhibition, described Rupert as an attempt to express physiology in a way that boys are familiar with—the steam engine. As such, the exhibit represented an early attempt at implementing a tailored and novel health communication method specifically for children.

The exhibit itself consisted of a steel outer shell that had the appearance of a primitive robot featuring rectangular eyes, mouth and frame rejecting, in entirety, the rhetoric of the flesh. A hinged door situated within the chest revealed a set of mechanisms that mimicked (although crudely) a human body at work. A pump worked two ‘lungs’ that moved up and down, which in turn, triggered mechanical action throughout the chest region. A second pump worked the ‘heart’. Our sample of boys was exposed to various forms of health messages through stories, posters and even a publication titled The Schoolboy’s Exhibition, London (1928–1930) by C. Stothard and I. A. S. Scott. 

Figure 1 Illustration of Rupert, the Mechanical Man, 1928. ©Illustrated London News Ltd/Mary Evans.

The exhibit experience consisted of a brief introduction and a demonstration performed by Major RM Cartwright. Despite press photographs at the time suggesting that schoolboys themselves could operate or be close to the robot, Rupert was designed to be demonstrated behind a barrier. Externally, the
robot had a crude appearance with little detail, although inside, the chest moved at great pace with many moving parts. British Pathé footage reveals a frenetic and somewhat chaotic sight.

The vivid representation of nerve functionality must have appeared particularly novel. An article in the Observer newspaper outlines its functions—

Then to explain the system of nervous energy and muscles, the demonstration will show how the brain acts. Every action is initiated in the brain, as the Robot will illustrate. A plug in the switchboard of the brain will be placed in the right spot, and the arm or the leg will be automatically lifted by an elaborate network of cables and pulleys.

Through physical interaction with the model the demonstrator therefore was able to describe a range of physiological processes to the audiences.

Much of the coverage of Rupert stated that both biological and health information were combined, claiming that the robot could help people to learn about looking after their health. An article in the Observer stated that Rupert was 'contrived with the object of making young men and boys interested in keeping their bodies clean and fit, and showing them how easy it can be both to upset the delicate mechanism of the human frame and to maintain it in good working order'. Although it is unclear how implicitly or explicitly this was undertaken.

Horlicks, a UK-based drinks manufacturer, displayed the robot on their exhibition stand and released details of its appearance and functionality to the press prior to the opening event, attended by Lord Baden Powell, leader of the British Scout movement and a significant figure in Britain at the time. Horlicks were regular exhibitors at a number of public exhibitions in Britain and often aligned their product with health benefits in print advertisements including the enhancement of the human frame and to maintain it in good working order. Another article reported how the machine helped boys understand how should look after their fitness, although it is.

In April 1929, a Popular Science article reported that the Horsham Health Week provides extensive descriptions of the health analogies found within the exhibit. In contrast, the article to promote the display at Kingston underplays any health content, instead choosing to promote the experience of viewing the robot (accompanied by a robot line-drawing without his insides displayed) and the promise of a free Horlicks drink for attending.

Rupert received positive regional, national and international press coverage at the time. His novelty aided impact beyond the exhibition hall and he was one of the most reported aspects of the exhibition as a whole, described as a 'Wonderful Steel Robot'. Most notably, Rupert was featured in a full-page illustration that accompanied his launch in 1928. The illumination of the robot, drawn by GH Davies, was featured in the Illustrated London News on 22 December 1928 (figure 1). GH Davies was an illustrator best known for his cutaway illustrations for the Illustrated London News. He was by no means a conceptual illustrator and the illumination appears to be very much based on descriptions and a photograph of Rupert provided by Horlicks. The Illustrated London News described Rupert as 'one of the most novel exhibits and thus the robot acted as a useful promotional vehicle for the exhibition as a whole. Rupert's breadth of press coverage demonstrated the potency of presenting physiology in a robot form at the time.

Vitally, the illustration was also known to Fritz Kahn in Germany, having been located in Kahn's personal archive of documents. As author of 'Der Mensch' and a significant figure in medical education and visual communication during the interwar years, Kahn's interest was likely due to the overall conceptual resemblance of the two pieces as well as the notable addition of the third dimension and its reference to a fully functional machine. It is not currently known however whether Kahn visited the Schoolboy's Exhibition in London or whether any further contact was made with either the illustrator GH Davis or the inventor but it provides a rationale of why the two 'images' can be very much viewed together. They share a similarity of analogies and are bound by publicity shared between London and Germany in 1928. In 1933, a model directly based on 'Der Mensch' with moveable parts and lights was shown at the Hall of Man at the Buffalo Museum of Science. Moving pistons simulated the action of the heart combining the concepts of Kahn in three dimensions with clear echoes of Rupert's physical mechanisms. This further increases Rupert's significance more broadly and invites subsequent further analysis of the robot from a Kahnian perspective later in this paper.
The Marvellous Mechanical Man, Chicago World Fair (1933)

The second newsworthy mechanical man to represent physiology was displayed in 1933 at the Chicago World Fair (in the Chemistry Section of the Hall of Science). This fair also witnessed the American debut of the famous DTM and the Deutsches Hygiene Museum provided several exhibits to the Hall of Science. According to the Chicago Tribune, the man was known as the ‘marvellous mechanical man’ (MMM). No human nomenclature was attributed in this case. Described as a ‘lecturing and animated robot’, it was 10 foot tall and made of metal. In terms of provenance, it was reported to be made by German scientists ‘who were not inclined to talk about their handiwork’, suggesting that the Deutsches Hygiene Museum team may well have been responsible for its construction, although this requires further corroboration.

The robot would ‘speak’ for 20 min, relaying information on digestive processes. Its functionality consisted of speech, the movement of the head, lips and of four-foot long arms. Its most novel feature though was an animation projected on the body itself, in the position where the organs would be found. The robot would point to its projected organs as it spoke. It began the demonstration by pointing at elements around itself and then gestured as if eating. The projection would then display the food being digested via an animated display on this chest in full view of a seated audience. An illustration from Popular Science vividly highlights this functionality, revealing the back light of the projector and an audience staring upwardly in wonder. Like Rupert, the MMM presented a spectacle of the body, by exploiting movement and robotic functionality. Also, like Rupert, the MMM was reported to highlight how the body worked and how the audience may care for their body. The MMM was surrounded by food items labelled with their vitamin content, chemical constituents and beneficial properties. Logan Clendening described the robot as being a complete demonstration of both digestion and nutrition including dietetics.

The MMM received significant attention and praise at the time. Eben James Carey (an American Anatomist who developed some of the exhibits on show) estimated visitors to the Hall of Science numbered 19 million people and a photograph of the visitors to the robot lecture shows a large room of adult men and women mostly filled to capacity. In this document, Carey visually juxtaposed this image of the lecturing robot with a strikingly similar photograph of crowds around the DTM on the same page. In a promotional leaflet, the robot was listed as a no. 6 highlight of the exhibits on show. Similarly, the doctor-journalist Dr Logan Clendening, writing in 1933, described how ‘the (man) most advertised is the least interesting’ (referring to the DTM) and continues to lavish praise on the new robot—calling it ‘vivid and a complete lesson in the physiology of digestion’.

He describes how the lecture room was crowded every time he attended. Muskat, a visitor to the exhibition in 1933, described the MMM as unique at the time and also recounts the experience of seeing both the DTM and the MMM at the same time. The quest for biological perfection was highlighted in contemporary articles heavy with rhetoric. Officials were quoted as calling the MMM ‘The most perfect mechanical man ever designed’. According to the Chicago Tribune, crowds gathered in the room and the public showed ‘amazement’ as a moving picture appeared on the chest as it spoke. It also described how some people wanted to stay and rehear the lecture ‘saying they have learnt more physiology in a few moments from the robot than they could in weeks of ordinary classroom study’. There was also a lighter tone in some of the press articles using headline words to dramatic effect such as ‘Perfect Chicago Man’s Nothing to Rave about Girls’ or describing the MMM as ‘handsome’.

The lavish descriptions of these mechanical men played a role in inciting excitement (and discussion) prior to the fairs, using the novel exhibits to attract readership and increase desire to attend. Unlike Rupert, whose novelty resided in the blatant display of whirring, mechanical and analogous parts, the MMM used the robotic form as a perfect shell on which to project a sanitised and literal process of digestion.

Godfrey, the empire exhibition, Glasgow (1938–1948)

The third mechanical man discussed in this study was known as Godfrey (figure 2, as shown in 1948). Godfrey was first displayed in 1938 at the Empire Exhibition in Glasgow, UK. He was the centrepiece of the ‘Fitter Britain’ exhibition at the British Government Pavilion. The Empire Exhibition was significant in size and reputation. It was opened by King George VI on 3 May 1938 and in its 6-month run attracted over 12.5 million visitors from around the world (including the Duke and Duchess of Gloucestershire).

An original publicity leaflet presented Godfrey as a highlight, saying ‘this 11-foot robot-like figure will show all the functions of the body in terms of engineering; a pump for the heart, a camera for the eye, and so on’. In terms of functionality, he too demonstrated digestive processes, but by ‘swallowing...
billiard-type balls of different colours.59 The viewer could then observe these different courses through the digestive tract—red for meat, yellow for fat and white for carbohydrates.60 The pancreas was represented by a set of test tubes and so a mixture of analogous images were used in one body. The seemingly blank area of the brain captured in photographs of the exhibit are misleading. When operational, areas of the brain were lit with words such as 'I WILL' or 'I LOVE' to represent the 'seat' of willpower or emotion.60 Blood was represented by a vivid opaque colour against a black background.62 Lungs were represented by rotating discs that rose and fell and the interior was 'brilliantly illuminated'63 to create an overall sense of spectacle. The descriptions of Godfrey imply that he himself did not move but he spoke via a record every 15 min aiding potential engagement further. Aesthetically, a classical-modernist style reminiscent of the work of British designer Eric Gill was adopted — the profile of Godfrey was highly stylised with flat, facial features and oversized head.

Godfrey’s provenance is impressive. He was designed by Richard Huws,63 an architect, sculptor and designer, who was most well known for his fountain sculptures at the Festival of Britain in 1951. A second version of Godfrey was made and redisplayed in 1948 and associated with H Lynton Fletcher,65 a former BBC Director of Recordings, who played a role more in engineering the mechanics rather than its visual design, which stayed similar throughout (bar the addition of visible zone labels in the later version).

Godfrey was the most well-travelled of the three mechanical men and benefited from being robust enough for transportation and high enough in novelty to warrant overseas attention. In January 1939, parts of the Fitter Britain Pavilion toured more widely.66 Godfrey was shown in Selfridges Department Store in London.67 In March 1939, he was shown in Copenhagen (he was mentioned specifically as one of the main features of an exhibition). In 1940, 2 years after appearing in Glasgow, he was displayed at the re-opening of the New York World’s Fair as ‘Mac the Mechanical Man’ (where importantly, he shared the same space as the DTM69 70). Godfrey also re-appeared in London in 1948 at The Health of the People exhibition where he was viewed by the then Princess Elizabeth during the opening as emphasised by an article and photograph in the Illustrated London News (figure 2).

As is the case with the other mechanical men the robot was reported positively in the popular and specialist press, including the British Medical Journal.66 Words used included ‘remarkable’, ‘amusing’, ‘stimulating’, ‘extraordinary’, ‘startling’, ‘scientific sensation’ and ‘the star of the show’.73 The robotic form of the body once more appeared to capture the imagination and engage reporters, editors and health educators alike.

There is a clear connection between the form of ‘Der Mensch’ and the conceptual and visual design of Godfrey in 1938. Sappol acknowledged a Kahnian approach manifest in the design of Godfrey. The central nervous system uses the same representational system. Godfrey however employs a much more varied approach. There is little doubt that Godfrey’s designer would have been aware of Kahn’s approach to visualising the body since the labelling of two prominent dials are identical (breathing and heartbeat). Both Rupert and Godfrey orbited ‘Der Mensch’ (which was translated into English and published in London in 1931), but what alternative approaches are manifest in their design—does a new type of body emerge?

EXTENDING THE MECHANICAL MAN: THE ACCESSIBLE BODY

The following section discusses the notion of the Accessible Body—a term I propose to characterise key distinctive features evident within the cases presented.

There are three key qualities referred to within the term Accessible Body: 1) a sense of consciousness, 2) the re-appropriation of popular culture and 3) a sense of amusement and visual appeal. The term ‘accessible’ refers to an increased sense of approachability offered to the viewer. All three qualities refer to a sense of being essentially human as opposed to a set of human organs. In short, they call on a viewers’ sense of their own consciousness, awareness of their current society, their positive emotions and their aesthetic sensibilities.

Consciousness

The Accessible Body was not a purely didactic Ideal Body machine—within each of the three mechanical men, resided the suggestion of the core of a conscious individual. With a new sense of added consciousness these machines, it can be argued, were designed with subtle touches to re-engage an audience situated in difficult economic and political circumstances.

Sappol acknowledged a Kahnian approach evident in the design of Godfrey as stated earlier. However, there are also two striking differences. First, there is an important acknowledgement of emotions that are absent in Kahn’s image. Zones in the consciousness area of Godfrey lit up specific emotions, including love. Godfrey’s ‘love zone’ resided in the upper quadrant of his head, sharing a zone with ‘Will’. Such a combination suggested a physiological whole that visually connected emotions to physiology in a new way.

Second, Godfrey appeared to have a visual memory made relevant to the viewer. John Macmillan at his Inaugural Address to the Central Council for Health Education,65 relayed how, although Godfrey had an English accent, ‘his mind is chiefly filled with memories of Scottish Beauty Spots’. If Godfrey’s memory ‘area’ displayed pleasant and familiar pictorial content to the Scottish viewer, a direct connection would be facilitated between Godfrey’s and the viewer’s memory (as well as, perhaps indirectly, promoting the great outdoors). A photograph of Godfrey from 1948 shows an image of a crowd of people in his ‘mind’s eye’—suggesting a meta-awareness of himself and himself as an exhibit, mirroring the audience he perceives. In contrast, Kahn’s Fordist Body was content free. Whatever the figure perceived externally lacked significance compared with the spectacle of the factory within the body. Content, whether of emotions, of love or a meaningful vision, was instead dominated by bodily processes in the Fordist Body.

In addition, Godfrey was creatively designed to reflect some conscious qualities in the way that he spoke and moved. Commentary at the time described how a human first introduced Godfrey, who opened his eye (to ‘wake’), and then described how Godfrey introduced ‘himself’ in the first person. Although not fully autonomous (he still required ‘waking up’), it suggests a new level of independence far removed from the automation embedded in the DTM or ‘Der Mensch’. The lack of distinguishable face or hair in ‘Der Mensch’ and the DTM (the casing in the latter being transparent of course) shows a deliberate neutrality, but in doing so sacrifices a sense of ‘being’ within the Ideal or Fordist Body.

Similarly, examples of the first person can be found in sections of scripts relayed by the MMM. For example, the phrases “Now Ladies and Gentlemen, I will swallow” and “watch my stomach contract to churn up the food” were used. This sense of
consciousness was not limited of course, to only these mechanical men. ‘The Talking Tooth’ exhibit on show also at the Chicago World Fair in 1933 exploited story-telling techniques in the first person to strong effect. The MMM though would also move his head and mouth and point to representations of his animated biological ‘reality’. This gesturing suggests mastery within his external environment and his internal body and offers a means of inviting the audience into his biological world.

Both the MMM and Rupert, it could be argued, facilitated a connection with the audience through a direct and outward gaze. Rupert’s eyes were permanently lit and outward facing, reminiscent of more recent Hollywood depictions of the cyborg—an electrically lit eye signifying life. Unlike the DTM, ‘Der Mensch’ and Godfrey, the GH Davis illustration of Rupert’s face is positioned frontally. Challenging the functional and passive profile view usually adopted, this mechanical man looks out the page at the viewer with a fixed gaze. It subverts the tradition in anatomical drawings of the dissected or ‘revealed’ subject to look elsewhere (eg, images by Vesalius, Van de Spiegel or Casseri). Given the lack of emphasis on cognitive processes, both Rupert and the MMM were able to face the audience (pragmatically afforded by no need to isolate, say vision from hearing in a profile view). Instead, they could apply the frontal gaze in an attempt to gain audience engagement.

Given these various visual and oral devices the three mechanical men, it is argued, all could be construed as representing a conscious body—conscious in themselves and conscious to the audience. The experience of viewing the DTM, or ‘Der Mensch’ would have been very different. Since the focus for both was situated much more on the parts rather than any aspect of characterisation, an important element of accessibility and relevance, I argue, was subtly denied. This consciousness and related autonomy in the Accessible Body increased the potential for both audience and press engagement (eg, leading to human nomenclature). This consciousness may also represent an embodied sense of individual responsibility for health behaviour (for food choice in particular in the case of the MMM). It may also relate to the responsibility of the individual manifest in the adoption of psychoanalysis in health education across Europe and the USA during the 1920s. This emphasised the role that free-will played in all aspects of life including health and afforded the individual a new concept of autonomy. Furthermore, Armstrong has argued that during the first half of the 20th century the discourse surrounding ‘health behaviour’ as a term developed both in the USA and the UK attributing agency and indeed malleability to the individual. Zaretsey has argued that psychoanalysis freed the individual from a traditional notion of dominant power (the family) to allow for a personal life. Consciousness, then, is suggested in relation to the mechanical men not in a Freudian sense of consisting of layers of the subconscious but as a means of reinforcing personal health awareness. If the DTM and ‘Der Mensch’ challenged the audience—children and adults alike—to relate their bodies to the new realities of science fiction manifest in the robot form. Rupert allowed them to marvel at their own other bodily functions to familiar images and objects.

The re-appropriation of popular culture
The Accessible Body appeared lighter and looser than its counterparts and aimed for audience appeal by relating digestion and other bodily functions to familiar images and objects. Rupert represented human physiology in three dimensions in direct relation to popular culture of the time—in this case, the robot. It is not indicative of a Fordist element here given increasing fears about automated workers. Instead more potently, it is a body that extends well-established man/machine metaphors by reinventing them explicitly in relation to contemporary cultural references. The exactitude of the metaphor freezes this particular ‘man’ in time without the universality of classicism found in the Ideal Body. The foundational concept of Rupert may be philosophically positioned, as may Kahn’s, as a three-dimensional re-enactment of the discourse of Vesalius, Descartes or Baglivi’s alignment of man with machine in the 16th and 17th centuries. Rupert may also offer a human physiological alternative to the automata of Vaucanson and Moore from the 18th and 19th centuries, respectively. We may however interpret the primitivism of Rupert as representing a critical stance between man and machine that rejects the idealism found in the DTM and indeed the Fordist Body of ‘Der Mensch’. Morus has articulated how a man/machine analogy provides ‘a way of making technological society appear as a natural extension of the human body itself’, although there is little reference to a naturalisation of technology in the visual manifestation of Rupert. A close up of Rupert’s interior reveals the grease and the blackening of components from frenetic automation. Through crude facial cut outs the designer made little attempt to naturalise this machine. Rupert literally embodies its time and delights in the difference between man and machine. It encompasses the widespread use of metal artificial limbs after World War I, emerging robots in various art forms (such as Capek’s play ‘RUR’ in 1920 and the film Metropolis in 1927), and importantly Britain’s first robot, Eric, demonstrated to large audiences for popular entertainment in 1928. As such, Rupert was thoroughly contemporary and challenged the audience—children and adults alike—to relate their bodies to the new realities of science fiction manifest in the robot form. Rupert allowed them to marvel at their own complexity while still feeling entertained as he whirred, wobbled and wheezed through the demonstration.

Equally, it is impossible to consider the MMM in 1933 without relating its form to the popularity of the movie cinema at the time. The body became quite literally a filmic canvas on which to project educational information. As a theatre curtain may pull apart, his shirt revealed a projection screen. Godfrey too, used a range of materials to tell his story—familiar materials such as billiard balls were dropped down tubes to represent digestion and everyday photography was used to depict vision. His overall appearance resembled modernist British sculptures that adorned architectural friezes at the time and thus his body also embodied familiar territory.

Carey, organiser of many of the exhibits on show at the Hall of Science in Chicago, stated in 1936, that ‘an unfamiliar exhibit has a popular appeal if the unknown was presented in easily grasped stages of the known’. Here, it is the use of that ‘known’ within popular culture that played a vital role in bringing the Accessible Body to a wider audience, particularly through alignment of the body with popular arts/entertainment. It is not a ‘niche-known’ from the medical examination room or the chemical factory but a ‘known’ based on popular cultural references. The Accessible Body as a whole consumed, reflected and transformed popular and familiar cultural objects of the time.

Amusement through visual appeal
The mechanical men of health featured small details to amuse the audience revealing a lighter approach to physiology than was evident in the Ideal or Fordist Body. John Macmillan, with reference to the 1938 Fitter Britain exhibition in its entirety
declared: ‘if health education is a pill it could not be more pleasantly coated than it is in the Fitter Britain exhibit’.67 Such a statement reflects the new ethos of health museum design in the period.3 As Rydell1 and Ganz82 discuss more generally, these exhibitions played a vital role in lifting a society experiencing severe economic depression.

There are several instances of humour inclusion worthy of note. The MMM, for example, re-enacted moments of affect in the first person. He was reported to conclude his lecture with the words “From the bottom of my mechanical heart I thank you all for your attention and I wish you all a good afternoon”.49 The bottom of a mechanical heart is a paradox and shows care in the light-hearted scriptwriting to attempt engagement through to the end of the demonstration. The designers included small moments within the dialogue to lighten what, particularly in the case of the MMM, was detailed physiological information (see Logan Clendening’s article from 193352 for a comprehensive outline of the information disclosed during the lecture). Godfrey in London also made headline news through his humorous apology to Princess Elizabeth at his inability to bow and his use of the wink instead, which he hoped was not ‘misunderstood’.71

Clearly, all the designers of the mechanical men strove for a certain level of aesthetic attraction in their visual form. The ‘good looks’ of the MMM and Godfrey should not go unnoticed. A news article from Birmingham reported ‘He (Godfrey) is not at all revolting’.73 and, given his classical good looks from the back, ‘fit to adorn any public hall’.73 An article in The Sphere made a point of saying how his classical looks denied any ‘frightening aspect’.62 A further report described him as ‘not so horrible’ as the ‘German glass man’52 and praise was given to the designer for their attempts at amusement. The Advertiser66 waxed lyrically about Godfrey, calling him ‘a scientific sensation’ as well as ‘amusing and stimulating’. The Chicago Tribune described the MMM as having a serious and intellectual face, far removed from the conventional image of a crudely shaped robot.49 Even Rupert’s face lacked any threatening presence being wide mouthed and expressionless. His invitation to shake bow and his use of the wink instead, which he hoped was not ‘misunderstood’.71

The mechanical men featured in this paper had finite lives due, in part, to the fallibility of their ‘bodies’. The demonstration of Rupert showed efficiency and a vulnerability in the complex whirring of each part. Each part is subject to failure—a jam, a puncture or a ‘spanner in the works’. Indeed, given diversity in photographic evidence of the time, both Rupert and Godfrey underwent repairs and upgrades. There was also a vulnerability to any machine composed of several parts. The organisers of the New York World’s Fair, for example, initially missed Godfrey’s explanatory voice since it was not initially shipped from London. Staff feared it may ‘be lost somewhere in the war’.59 He was also reworked after World War II with additional electronic functions.63 As such the Accessible Body, as it relates to mechanical men, was also a vulnerable body, subject to physical malfunctions and costly repairs. It was also a vulnerable body in terms of the passing of time. A public’s sense of wonder shifts rapidly in respect to technological innovation and to aesthetic concerns, thus the Accessible Body required periodic reinvention both internally and externally.

CONCLUSION: THE MECHANICAL MEN AS MESSENGERS FOR TODAY

This article has described and analysed features of three mechanical men of health, arguing how they offered an alternative to the Ideal or Fordist Body manifest in the DTM and ‘Der Mensch’, respectively. This alternative is identified here as the Accessible Body, a term that encompasses a level of body consciousness, re-appropriation of popular culture and a sense of amusement and light-hearted appeal. In many ways, this approach is still one based on ideologies of control and manipulation. Viewing the Accessible Body critically, we could conclude that it is just as problematic as the Ideal or Fordist Body. As Vallone83 points out, images of giant robots evident in all exhibitions during the period represent notions of ideal masculinity and any use of a mechanical man therefore may well be representing covert ideals whether accessible or not. In addition, by embracing attention to scriptwriting, to visual appeal, personality and amusement, the designers of these machines could be viewed as adopting persuasive techniques, perhaps transforming mechanical men into salesmen of health. The Accessible Body therefore is not ideologically neutral.

It is not difficult to translate many of the ideas evident in the Accessible Body of the past into concepts for present day novel health communication practice. For instance, we may employ life-size animated projections on real bodies to represent effects of health behaviours. We may construct more complex ‘personalities’ or figures with suggested consciousness as means of evoking engagement. We may seek novel interpretations of the mechanical body using today’s cutting-edge technologies by exploiting ambient or virtual realities. The health communication designer may test the impact on the audience of using positive emotions such as a humour to increase affection towards exhibits or indeed our own bodies, usually reserved only for children today. Towards the end of the 20th century, Boon reflected on the lack of humour found within science displays generally, wondering whether we had ‘deprived ourselves of a powerful tool in museum display’.84 The lighter-hearted touches evident in the mechanical men’s descriptions above deserve new consideration today.

McLeary and Toon8 are critical of the claim that ‘anatomical revelation’ is an effective mode of health education and there is a growing discourse of criticism surrounding novel displays of anatomy.85 Instead, we could argue that health education today demands an anatomical narration in which the machine body has to both function and malfunction. During the interwar years, the act of malfunction would have created a tension between an efficient body and an efficient museum exhibit and it would have certainly pushed against the utopian vision at the time. Gebhard wrote in 1945 that, in a good health museum, ‘clarity, beauty and health must prevail everywhere’.16 Today, however, there is an argument for focusing on health and states of unhealth—employing an Accessible Body display that may be damaged or repaired, where possible, through behavioural changes/medical intervention. In doing so, its sense of consciousness, reference to popular culture and levels of amusement would all need to be imaginatively reworked.

Perhaps the most vital discussion these mechanical men raise today however is the use of mechanics (or electronics) to represent the body. As already highlighted, the man-machine metaphor has a long-standing history and it has also shifted over time to embrace changing technologies.1956 Within our understanding of the body, of illness and medicine the machine metaphor remains prevalent today. The metaphor has worked itself into common language so prevalently that we barely recognise it as
a metaphor. There has been much focus on metaphors used in language to express illness. Much of the debate concerning metaphors focuses on the usefulness for patients and doctors, their potential stigmatising effect, patterns of usage and different uses of metaphors for different illnesses. The visual metaphor has received less attention in health communication research and there is much work still to be done on understanding the potential of metaphorical approaches that may reside in the use of dynamic and three-dimensional exhibits (moving-metaphors) or interactive exhibits (doing-metaphors).

Clearly, the mechanical representations used in Rupert, ‘Der Mensch’ and Godfrey are still found in everyday medical language. Weiss found that mechanical metaphors were prevalent when doctors and nurses discussed understanding of and associations with heart disease, for instance. Drawings by health professionals, for example, revealed images containing pistons that had stopped working or an assembly line on strike. This metaphor has been employed more broadly in health-service advertising in Britain. For instance, the 1992 campaign for ‘The Health of the Nation’ initiative in Britain was accompanied by cutaways showing mechanical parts and the ‘Man Manual’, that represented the body via a Haynes Manual aesthetic usually reserved for cars, was a notable success when first published in 2002. Bleakley, however, is sceptical of the place of the machine metaphor in modern medicine and healthcare, describing it, particularly when coupled with war metaphors as alienating, masculine and overtly dominant in character. Instead, he proposes a new series of metaphors based on (i) health as balance and imbalance, (ii) medicine as collaborative exploration rather than individual struggle and (iii) illness as a journey. A new Accessible Body must reflect and transform such ideas: it may be one of multiple interactions and multiple bodies or its ‘plumbing’ more aligned with roads than pipes to represent journeys. With radical repositioning of the body how would viewers respond and where would the journeys lead? Making an association between historical Accessible Bodies and the latest thinking in health metaphor construction could indeed be a powerful force for the creation of innovative and meaningful ways of representing the body to the public today.

It is not difficult to discern the direct legacy in exhibitions today of the DTM. This is evident through the addition of real flesh and diverse body postures found in the radical display ‘Bodyworlds’ and continued display of transparent men and women throughout the world. Nor is it difficult to see the influence of ‘Der Mensch’. It was recently featured in The Wellcome Collection’s ‘Can Graphic Design save your life’ exhibition (2017), its animated and exhibition format is still on display at Buffalo Museum of Science today and an on-line animation of ‘Der Mensch’ by Lederer boasts 414k views. There is however much to be gained by uncovering exhibits that escape the sieve of time (to paraphrase Hillary Mantel), once history has been ‘poured through it’. Certain dominant figures and their legacy can sometimes academically obscure other exhibits shown at smaller events. There is likely to be evidence of public performances and artefacts related to physiology in other countries remaining in archival state. To collate documentation of them is important if we are to understand the full range of ways physiology has been represented in the past, to help inform and question the design of the body images of the future. By directing sustained academic attention on the iconic representations of the body, we miss a myriad of other short-lived though popular creative approaches to representing an Accessible Body. We could consider the Accessible Body the mayfly of the body-display world as it rises and falls freely through time, watched by the steady eye of the DTM or Der Mensch als Industriepalast. Through their study in relation to each other, we may also learn to resee the famous examples, much as a visitor to the New York World’s Fair in 1940 may have walked from hall to hall, considering the diverse approaches on view. The lesser-known mechanical men brought to attention in this study, it is argued highlight the fluidity of representations of the body during the interwar years. They also provide a framework, although a loose one, for considering the physical manifestation of new body metaphors and for questioning continued persistent practice found in the body/machine metaphor. This Accessible Body it is argued, offered a new sense of consciousness, it absorbed and reflected popular culture of the time and it aspired to bring a new sense of pleasure to the audience through humorous touches and attention to detail. As such, it remains thoroughly flexible and relevant to the health communicator today.

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REFERENCES

1. Rydell RW. World of fairs: the century-of-progress expositions. Chicago: University of Chicago Press, 1993.
2. McLeary E, Toon E. “Here man learns about himself”: visual education and the rise and fall of the American Museum of Health. Am J Public Health 2012;102:e27–36.
3. Owen H. Simulation in healthcare education: an extensive history. Switzerland: Springer. 2016.
4. Gebhard B. Health education in Germany. Am J Public Health Nations Health 1934;24:1148–51.
5. Sappol M. Body modern: fritz kahn, scientific illustration, and the homuncular subject. Minneapolis: University of Minnesota Press, 2017.
6. Mold A. Exhibiting Good Health: Public Health Exhibitions in London, 1948–71. Med Hist 2018;62:1–26.
7. Wilk C. The healthy body culture. Wilk C, ed. Modernism: design a new world. London: V & A Pub, 2008:1914249–199995.
8. Smith V. Clean: a history of personal hygiene and purity. Oxford: Oxford University Press, 2007:310.
9. Welschman J. ‘Bringing beauty and brightness to the back streets’: health education and public health in England and Wales, 1890–1940. Health Educ J 1997;56:199–209.
10. Zweiniger-Bargielowska I. Raising a Nation of ‘Good Animals’: The New Health Society and Health Education Campaigns in Interwar Britain. Social History of Medicine 2007;20:73–89.
11. Vogel K. The Transparent Man—Some comments on the history of a symbol. In: Bud R, Finn BS, Trischler H, eds. Manifesting Medicine: Bodies and Machines. Amsterdam: Harwood Academic Publishers, 1999:31–61.
12. Canadelli E. The diffusion of a museum exhibit: the case of the transparent man. In: Panebianco E, Serrelli S, eds. Understanding Cultural Traits. Switzerland: Springer International Publishing, 2016:61–80.
13. Borck C. Communicating the Modern Body: Fritz Kahn’s Popular Images of Human Physiology as an Industrialized World. Canadian J Commu 2007;32:495–520.
14. von Debschitz U, von Debschitz T, Fritz Kahn. Germany: Taschen, 2013.
15. Roberts L, ed. Can graphic design save your life. London: Graphicdesigngr, 2017.
16. Gebhard B. Art and science in a health museum. Bull Med Libr Assoc 1945:33:1:39.
17. Cogdell C. Eugenic design: streamlining America in the 1930s. Pennsylvania: University of Pennsylvania Press, 2010.
18. Kleinschmidt HE. New Germany teaches her people: an account of the health exposition of Berlin. Am J Public Health Nations Health 1935;25:1108–13.
19. Martin E. the end of the body? Am Ethnol 1992;19:121–40.
