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Design and Consume to Utopia

Where Industrial Design Went Wrong

Tara Andrews

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It is implausible today, in the face of over-consumption and climate change, that a manifesto would urge designers to hone their skills of persuasion to stimulate the consumption of material goods, create desire for the unnecessary, and encourage artificial obsolescence. Yet this was the call of *Consumer Engineering: A New Technique for Prosperity*¹ a proto handbook for American industrial designers. It is easy to see, in how the early industrial designers worked and the texts they penned, that they saw their job as one of depression-recovery: to strengthen the economy consumption had to be increased by injecting products with 'eye appeal'. At first, the history reads as a short-sighted economic strategy (with consequences too large to fully grasp) that heavily implicates design in the crisis of the unsustainable present. By asking 'What were they thinking?!', this paper tries to make sense of the intent behind the Streamlining decade of design in the United States.

It is posited that rather than just a quick-fix to the Depression, early industrial design set itself the task

of achieving ‘total environmental reconstruction’ – long term economic and material well-being projected as a compelling vision of a Utopian future. To achieve this hubristic vision, the stimulation of consumption was merely the means – a way to speed up the path to a perfect future end-point. The paper therefore problematises design’s agency in the unsustainable and may be useful in informing contemporary design strategies to respond to our current imperatives.

1

Two things are striking about Sheldon and Arens’ *Consumer Engineering*: the enthusiastic encouragement of wasteful consumption and the uncanny resemblance between their proposed ‘consumer engineer’ and the industrial designer – a personage born out of the Depression decade. Consumer engineering as a strategy to increase consumption for depression recovery has been discussed by Jeffrey Meikle as a sort of economic backdrop to the rise of the industrial designer.² Tony Fry has also discussed industrial design’s complicity in the stimulation of material consumption, implicating early industrial design heavily in the current crisis of over-consumption.³ The reading of *Consumer Engineering* below goes further, suggesting that industrial design wasn’t just complicit – consumer engineering was its *modus operandi*.

Consumer Engineering

In *Consumer Engineering: A New Technique for Prosperity*, published in 1932, admen Roy Sheldon & Egmont Arens presented a practical new ‘business science’ that sought to stimulate consumption to keep apace with modern production. It was a depression-recovery strategy popular with the business community⁴ and was defined as ‘any plan which stimulates the consumption of goods’.⁵

Sheldon and Arens’ argument for the need to increase consumption was emotive and fervent. They had great faith in the American production machine to lead the way out of the crisis. They argued against ‘going backwards’ by moderating production⁶ and attempted to shift the theories of efficiency that supported productivity, to consumerism, so that the equilibrium of production and consumption could be restored. The means to achieve this was inspired by the success of the scientific method in engineering demonstrated by the country’s mass production capacity: ‘But if a consumption technique were developed as scientific and well organised as our production technique, the balance between producing and consuming would be re-established’.⁷

Their model of economic efficiency required defining the role of the efficient consumer. Their strategy included ‘Humaneering’ or the ‘new psychology’ with references to contemporary behaviourists who had developed appropriate methods ‘to study the human being behind [the] market’.⁸ Such methods could be

applied by the consumer engineer ‘to make each of us a more active and efficient consumer’.⁹ They saw the buying public as having unlimited potential to consume because they recognised that what people paid for was ‘satisfaction’ which could always be ratcheted up.¹⁰ Consumer desire and satisfaction were treated as anticipatory, intangible and unlimited: ‘It is the consumer engineer’s business to increase every sort of satisfaction’.¹¹

A passionate argument for artificial obsolescence is posited frequently throughout the text to counter the entrenched climate of thriftiness in which it was written. Thriftiness is considered the greatest barrier to Sheldon’s and Arens’ concept of progress. Artificial obsolescence is heralded with new catch phrases, ‘progressive waste’, ‘creative waste’ and ‘fashion promotion.’¹² It is inspired by changing fashion in clothes, and is seen as an important strategic device for stimulating consumption for economic recovery: ‘Wearing things out does not produce prosperity, but buying things does’.¹³

The argument for artificial obsolescence supports Fry’s claims that this was a significant moment in the history of unsustainability. Fry implicates industrial design in the normalisation of unsustainable habits: ‘whereby less and less of what gets purchased gets used up, exhausted or consumed, and more and more needs become immaterialised’.¹⁴ Although this is read as unfolded in the present, the aim is explicit in *Consumer Engineering*: ‘Goods fall into two classes, those we use, such as motor-cars or safety razors, and those we use *up*, such as toothpaste or soda biscuit. Consumer engineering must see to it that we use *up* the kind of goods we now merely use’.¹⁵

Links between Consumer Engineering and Industrial Design

The consumer engineer’s job was to ‘measure, create and promote’¹⁶ and most of Sheldon and Arens’ book was devoted to practical methods including market research, trend forecasting, product styling, and distribution. The industrial designers subsequently integrated these methods (to measure the market and the consumer, and create stylish and functional products) into their own practice. Although roles blur between industrial design and the proposed consumer engineer, Sheldon and Arens saw industrial design as a strategy to be deployed within a consumer engineering team. This team was to be comprised of a range of professionals with various skills, but would generally be controlled by an advertising agency, which they felt already had considerable expertise and appropriate resources at hand.¹⁷

This reflected how industrial design was emerging within advertising, as manufacturers naturally turned to advertising agencies for assistance with product ‘eye appeal’. Saturated markets in the mid to late 1920s meant that manufacturers had little choice

but to engage with product appearance.¹⁸ A number of industrial designers received their first commissions from either working within art departments or by being introduced to manufacturers via advertising agencies.¹⁹ It suited advertisers to embrace product styling as a sales strategy in the face of increased resistance to pure advertising and depressed markets: better looking products made the advertiser's job of selling them easier.²⁰

The desired traits of the consumer engineer were echoed by early accounts of what an industrial designer was. For Sheldon and Arens, the consumer engineer was: grounded in intimate knowledge of production, merchandising, sociology, psychology; could communicate with business and consumers; had a sense of style; tapped into fashionable trends; had foreknowledge of what would be popular; was mechanically-minded; and inventive.²¹ For Harold Van Doren, writing a text book for the profession in 1940, 'the job of the industrial designer is to interpret the function of useful things in terms of appeal to the eye; to endow them with beauty of form and color; above all to create in the consumer the desire to possess'.²² Desirability was achieved 'through increased convenience and better adaptability of form to function; through a shrewd knowledge of consumer psychology...'.²³ He provided the means of accessing consumer demands through market research²⁴ and encouraged future trends research.²⁵ He described how design fitted within industry and provided anecdotal tips to help open dialogues with manufacturers. Creativity was also addressed (by immersing oneself in the design problem)²⁶ as was merchandising and 'the practical side' of design which took account of production economics. The traits of the industrial designer were identical to those of the consumer engineer.

There was also significant exchange of ideas between industrial design and consumer engineering. Van Doren²⁷ quotes Sheldon & Arens²⁸ in his text book, and there are almost identical passages in *Consumer Engineering* and Norman Bel Geddes' *Horizons*,²⁹ the first book to appear on the topic of industrial design. In their 1936 history of the young profession of industrial design, Cheney and Cheney³⁰ cite *Consumer Engineering* a number of times, but by 1936 with the profession clearly distinguished from its advertising roots, consumer engineering is relegated to that phase in the industrial design process which analyses the market and consumer desires.

Walter Dorwin Teague, who was influential in the stabilisation of industrial design workflow and methods to meet the needs of industry, was mentored in the early stage of his career in advertising by Earnest Elmo Calkins, the first to term 'consumer engineering'³¹ and who introduces Sheldon and Arens' book. Teague later collaborated with Egmont Arens in the design of the New York World Fair (Arens designed the Production & Distribution Focal Exhibit).³²

Product Consumption for Progress

The similarity between industrial design and consumer engineering is important to establish because it suggests that industrial design is more heavily implicated in the current crisis of 'over-consumption' than either Meikle or Fry's accounts suggest. It also questions the role industrial design might play in a sustainable future, not just because it is historically complicit in consumerism, but because the methods that were developed by the early industrial designers, which remain little changed in today's practice, were furthering economic aims that are the antithesis to contemporary sustainability imperatives. How can design methods that were developed directly to counter *under-consumption* be redeployed to counter the contemporary crisis of *over-consumption*?

Accelerated consumption was not perceived as a quick-fix response to economic depression, however. It was pursued as part of a long term strategy to greatly improve human well-being (materially) and achieve a prosperous and Utopian future. Sheldon and Arens had sought to define the role of the 'efficient consumer' as a functional unit in their model of balanced socio-economic efficiency. This picked up on the cultural trends that were moving toward social efficiency.³³ What artificial obsolescence was doing, besides speeding up the economy, was driving material progress toward Utopia, and the role of the consumer in this was integral. Sheldon and Arens saw Utopia as a positive flow-on effect to escalated consumption. But for the industrial designers, the building of Utopia became the prime directive, and consumerism was necessary to achieve it. By speeding up consumption rates, material progress could happen faster and Utopia could arrive sooner. So how industrial design is seen to be implicated in unsustainability needs to be extended from its role in increasing consumption, to its ambition to achieve Utopia, because consumerism was only a means to an end. This argument will be elaborated on in Part Two. For now, it will be shown that *Consumer Engineering* appears to have pre-empted the industrial designers' vision.

In *Consumer Engineering*, artificial obsolescence is presented as a means towards improving well-being as greater customer satisfaction is achieved with a faster evolution towards better products.³⁴ The economic cynicism of artificial obsolescence is countered by the position that stylistic changes bore with them radical and widespread improvement in the appearance and functionality of the everyday world: the 'engineer-artist...has simplified housekeeping in all its phases....has touched every wall and every object with beauty' and is 'on his way to Utopia'.³⁵

Teague shared Sheldon and Arens' view that their work was driving progress toward Utopia and later reiterated *Consumer Engineering's* claims that Utopia was imminent:

The products of industry, those things made by science working with our modern tools and techniques, have led advances to our new order. They bring into our homes, in ranges, refrigerators, heating and sanitary equipment and a long list of minor appliances, a Utopian perfection of organisation that arouses our delighted enthusiasm.³⁶

For Teague, however, Utopia was the ultimate design aim, not merely a by-product of artificial obsolescence. He expresses faith in the need for rational planning to help order an increasingly complex world³⁷ and demands self-conscious, exacting design methods, for 'this task of environmental reconstruction we still hope, optimistically, to perform'.³⁸

Bel Geddes also had high ambitions for industrial design at its inception. Here, he describes what the future historian would see: '...In the midst of a world-wide melancholy owing to an economic depression, a new age dawned with invigorating conceptions and the horizon lifted'.³⁹ In a similar vein to *Consumer Engineering*, he interpreted improvements in product design as evidence for, and the means to achieve this new age. In one instance, he presented a series of car designs that worked backwards from a future perfect.⁴⁰ Bel Geddes envisioned a radically streamlined and therefore apparently functionally perfect car of the five year future (Number 5). The market wasn't ready for this sort of perfection yet, however, because of the radicalism of the aesthetic. Stylistic change had to be introduced more slowly, to prepare society for the ultimate. He therefore designed backwards five steps from the ideal future to the present in order to direct stylistic and functional progress. This progress was dependent upon consumers purchasing the intervening models: car Numbers 1 to 4.⁴¹ Industrial design was interested in stylistic change within a gradual evolution towards the perfect, and seemed to have believed that its economic function (to stimulate consumption) was furthering this aim.

Many of the aims and methods presented in *Consumer Engineering* became more thoroughly elaborated as industrial design gained momentum. Sheldon and Arens had begun to capitalise on the popularity of style for its economic potential, and to clearly define the economic role of the consumer. Because of its emphasis on the economic potential of style to balance consumption with production, consumer engineering provided a powerful argument for the merits of industrial design to industry. It also provided an economic theory that suggested that Utopia could be reached via industrial design and material consumption.

Industrial Design's World of Tomorrow

Industrial designers were enamoured and familiar with future imagining of the perfect. This is evidenced in their numerous textual and visual narratives of technological futures⁴² and more

notoriously in their elaborate models of the World of Tomorrow at the 1939 New York World's Fair. This preoccupation with Utopia was already widely popular thanks to Edward Bellamy and H.G. Wells' fictional technological Utopias.⁴³ But it was the industrial designers' faith in consumer engineering and their steadfast commitment to Modernist ideology that took Utopia from the realm of fantasy to a workable, designable and imminent reality. Their departure from literary precedents was their belief that the future could in fact be designed and that it was close at hand (in technocratic Utopian literature, the future was usually 100 years away, but at the New York World's Fair it was as close as 1960⁴⁴). The industrial designers' mobilisation of future visions helped evidence that the building of Utopia was underway and was used to gain momentum for its realisation.

Industrial designers' vision of Utopia was dependent upon industry and consumers: their roles in the socially efficient system required definition and consensus. In order to garner this consent, industrial design persuaded industry to become a leading part of the World of Tomorrow vision, arguing that industry's role in the vision would be sustained by the concomitant education of consumers. How they achieved this was by equating happiness with products and engendering a sense of 'product-based well-being'.⁴⁵ This was an attempt to remake society by creating links between its most integral components.

Futurama, the most popular of the Fair exhibits, was a reflection of Bel Geddes' own blueprint for the future of transport that he had begun working on in 1936 in advertising illustrations for Shell.⁴⁶ He convinced Shell to fund the building of a scale model of his vision which was photographed and appeared in Shell advertisements in 1937. He had successfully pitched the more ambitious Futurama exhibition to Goodyear who pulled out of the New York World's Fair as late as 1938. He then managed to convince General Motors to realise his vision for their exhibit in the Fair. Roland Marchand highlights Bel Geddes' powers of persuasion to enlist GM's support (of \$2 million) at such late notice and then to have them extend their commitment to over \$7 million.⁴⁷ He had no problem in aligning his vision to one that would benefit GM (Futurama promoted the extension of highways, car sales, and industry's future societal role).⁴⁸ This supports the claim that he had a blueprint for environmental reconstruction and that he enrolled industry in the project: that design's role was to envision the future, while industry and consumers were to work in concert for its realisation.

2

What is most extraordinary in this history is the apparent hubris of the industrial designers. It prompts the question of why they imagined that their design skills could and should be extended from industrial products to the redesign of entire socio-economic

systems. Their self-promotion, success in industry and ability to tap into and enlarge all that was popular – the new, the fast, the functional and the stylish – provided a political, economic and cultural mandate to take the lead into a consumerist Utopia. But it was their Modernist leanings that provided a theoretical platform, spurring on their larger schemes. First it will be shown that the industrial designers' engagement with industrial processes allowed them to claim the realisation of Modernism's 'form follows function' dictum. Their accounts of their working methods, very strong arguments for the value of the industrial design process, were used also to claim that perfection in product design was achievable because of the rigour and scientism they deployed (their application of functional analysis). The multiplication of their popular Streamlined forms that were populating the built environment appeared to evidence the arrival of a revolutionary new art form – a style to end all styles. There was a sense of evolutionary progress toward the perfect in the making, with the industrial designer at the forefront of the advance, himself at the apex of human evolution.

Teague, Bel Geddes and a number of other leading industrial designers pursued a Modernist agenda inspired by the likes of Le Corbusier, Louis Sullivan and Adolf Loos. Meikle cites calls to achieve a Modern style to end all styles from Hugh Ferriss, Lewis Mumford, Donald Deskey, and Paul T. Frankl.⁴⁹ The American industrial designers heralded, promoted and sought to speed the arrival of a new age, aesthetically representative of its time.⁵⁰

This need for Modern authenticity was derived most directly from Le Corbusier who was frustrated at the slow pace with which the decorative arts was responding to a dramatically changed built environment. The changes wrought via the mathematical precision of large scale civil, mechanical and aeronautical engineering were celebrated as true aesthetic representations of Modern life and its promise, and should be emulated in all design work.⁵¹

Le Corbusier's demand for authenticity was based upon Louis Sullivan's dictum that 'form ever follows function'.⁵² True art and beauty was achieved when the immutable laws of nature were followed. In 1896 Sullivan had emphatically called on design to realise the natural beauty that resided within the designed:

And thus, when native instinct and sensibility shall govern the exercise of our Beloved art; when the known law, the respected law, shall be that form ever follows function... [When this is accepted, we will have] a freedom that the very beauty and sumptuousness of the outworking of the law itself as exhibited in nature will... [result in architectural art becoming]... a living form of speech, a natural form of utterance'... deep and true 'on the high-road to a natural and satisfying art, an architecture that will soon become a

fine art in the true, the best sense of the word, an art that will live...⁵³

Christina Codgell follows the links to American industrial design from Sullivan's mid nineteenth century predecessor, Horatio Greenough and his theory of 'Form and Function' which outlined principles of construction based on observations in nature.⁵⁴ This theory was translated by Sullivan into an 'inside out' approach to designing which is later restated in Le Corbusier's process for determining the form of a building from its inner requirements. Sullivan's claim that there was one natural solution to a design problem, and that this was achievable via functional analysis⁵⁵ is what the industrial designers believed they were realising with their own design methods.

As industrial design moved from servicing industry with 'eye appeal' via superficial styling, to delivering cost-reduction methods to increase profit, it got closer to realising the aims of Modernism. An increasingly significant role in manufacturing industries throughout the 1930s allowed it to have influence over the entire production process, meaning that form could be derived from functional analysis of manufacturing constraints. Industrial design was thus able to put Sullivan's plan into action: to design for functional perfection from the 'inside out.' The moment when industrial design came into being is when 'the artist entered the factory'. This mythic beginning was cited in a number of texts as a moment of importance: for the Cheneys⁵⁶ and Bel Geddes⁵⁷ it was the celebratory and revolutionary arrival of industrial design as a new art form. Via the widespread dissemination of mass produced goods, industrial designers helped achieve a visual unity and language appropriate to the Machine Age.

Industrial designers frequently penned detailed accounts of their methods⁵⁸ which were presented as linear, step-wise, logical, and thorough: appropriate in the wake of rationalised production success, and in which, economically, precision was essential. The methods were often used to support claims that industrial design was 'serious', professional and collaborative when addressing business audiences as potential clients. Sales figures achieved for products after re-design were cited, often within illustrated case studies of the redesign process which described the product before and after design.

Sally Clarke suggests that industrial designers' results were hard to quantify, their research methods were particularly non-scientific compared with engineers', and they were completely unqualified until the institutionalisation of design education.⁵⁹ Clarke's review of industrial design as a highly risky business investment explains the necessity for the wide promotion of 'serious' methods, rapid dissemination of design texts, design process accounts, and the

sophisticated deployment of rhetorical techniques to evidence a degree of professionalism.

Without recourse to the 'truth' of scientific knowledge, the design process itself substantiated the argument for the final design, as did a series of persuasive design milestone communications: concept renderings, working and presentation models and the finished product. Their processes are described here to help explain why industry may have been receptive to the skills industrial design offered, and also to begin to understand the thinking that underpinned designing at this time. What the process and methods show is that industrial design was thought to be logical, objective, thorough and capable (according to the industrial designers) of yielding perfection.

The design process was presented reductively as an equation: systematic analysis would result in rightness. If the inputs were thoroughly investigated, the output would be the one perfect design solution. Henry Dreyfuss' design process for kitchen utensils was characterised thus by Cheney & Cheney: 'When such procedure is followed by a man who is primarily an artist of integrity and ability, competent to work realistically among twentieth-century mechanical facts until an aesthetic equation results...'.⁶⁰ The step-wise conception of the process presented design as a profession ruled by logic: 'Continual analysis imposes integrity and directness in the mental processes and eliminates guessing and whimsies... Our ground work is founded wholly on facts';⁶¹ and goal-directed certainty: 'throughout this process there was no deviation from the original scheme, no trial and error guesswork'.⁶²

Following *Consumer Engineering's* model for a new 'business science', industrial design methods sought to establish the profession as a science of problem-solving, employing wherever possible, 'scientific' research methods (for example, to counter wind-resistance in transport design).⁶³

How the process, methods and communications came together as a persuasive argument for industrial design is demonstrated by Bel Geddes' account of the designing of a stove for Standard Gas Equipment Corporation in *Horizons*.⁶⁴ This is a somewhat propagandist account that highlights the certainty offered by rational industrial design methods. He outlined the design 'problem' as a series of design criteria determined through scientific research methods. These determined the requirement for visual consistency with other kitchen appliances and the need for it to be easy to clean. According to *Fortune* magazine, these were arrived at from extensive user research wherein 'Corps of investigators interviewed hundreds of housewives and stove dealers – the field reports made a book of 300 pages'.⁶⁵ The existing stove's design faults were listed, then the process of redesign was described with justifications for every design move, highlighting design improvements concerning functionality and manufacturing efficiency. The redesigned stove

synthesised every conceivable design consideration, was a radical departure from its predecessor and dazzled in white, abstract beauty in a full page colour rendering.⁶⁶ The justifications leave the reader in no doubt that the resultant stove is the one perfect solution to a thorough analysis of the problem.

The transience of functional perfection became apparent to industrial design when soon after designing the perfect solution, it was commissioned thereafter to annually update the design: to improve upon perfection.⁶⁷ When the plausibility of functional perfection in individual product design, (which Sullivan had suggested was possible) was thus contested, the early industrial designers re-interpreted functional perfection as *evolutionary*. This was theoretically supported by Le Corbusier's theory of ideal type-forms.

Le Corbusier had described the evolution of objects towards perfection via standardisation. In new Modern objects, a wide number of styles compete (as in evolutionary theory) and experimentation leads to a convergence toward a final, perfect type-form.⁶⁸ Codgell finds evidence of Bel Geddes' keen interest in these principles reflected in his hobbyist experiments and readings in evolutionary biology.⁶⁹ Le Corbusier's theory seems to support industrial design's conception of a Utopian 'end-point' which could be achieved via escalated consumption. So rather than being deterred, a dynamic consumer market provided industrial design the opportunity for experimentation, thus driving stylistic and functional improvement toward the ideal.

The industrial designers believed that incremental redesign (which sustained the profession and the market requirement for the ever new to drive desire for products) was in fact evidence of evolutionary progress toward the ideal. Bel Geddes' cars nos. 1–5 (discussed above) evidences this interpretation of redesign as progressive as do Raymond Loewy's product evolution charts which visually document incremental technological and formal changes in transport, products, housing and womens' fashion according to an evolutionary model.⁷⁰

The industrial designers' evolutionary model also allowed them to assume an elevated position to reorder the built environment. Codgell suggests that industrial designers, especially Bel Geddes, believed themselves to be amongst an elitist class of thinkers capable of societal leadership.⁷¹ Codgell locates this elitism in the origins of Modernist theory and attributes it to Adolf Loos' 'Ornament and Education' of 1924, which outlined recapitulation theory. He suggested that Modern western men (himself included) were at the 'apex of evolutionary advancement' as evidenced by their technological advancement and the simplification of their object forms.⁷² Loos made evolutionary comparisons to demonstrate that 'primitive' races were the child-like versions of the adult Western male. Codgell also provides

evidence that Louis Sullivan equated advanced, simplified styles with human evolutionary progress. Industrial designers followed suit and believed that they were among the privileged class of the 'best brains' and the 'most capable' in society.⁷³ They were the most evolutionary advanced, the Men of Tomorrow, and intellectually capable of rebuilding the world.⁷⁴ As a new breed of forward thinking Modern men, they 'positioned themselves as the evolutionary apex of society, not in the lot of the 'common man' but at the forefront of advance'.⁷⁵

Despite apparent product obsolescence, evolutionary theory and Le Corbusier's ideal type-forms sustained the industrial designers' belief in functional perfection. This is problematic because it suggested that the ever new was getting somewhere: that it was moving toward a greater good. But when that greater good failed to conclude in a static Utopia of material abundance for all, it took on the evolutionary force of the inevitable. To equate product evolution with biological evolution suggests that escalated technological production and consumption is unavoidable: a larger evolutionary process beyond human control. This is a social construct that resigns us to the unsustainable as the status quo, and industrial design to the constant fabrication of 'newness' in an evolutionary and technologically progressive trajectory.

Designers' faith in their own creative abilities, their celebrity, and their triumph as harbingers of Modernism helps explain why they ambitiously sought to extend their influence from designing products to designing everything: why they undertook, as society's guidance system, total environmental reconstruction.

What this paper has attempted to show, is that industrial design did more than make mass produced products desirable as a means to stimulate consumption. Industrial design extended (what it mistook for) precise design methods and functional perfection to larger scale human systems. In doing so, it defined the role of the consumer as a functional unit in what would be an efficient and balanced socio-economic system. It provided industry with the tools to make more products more economically and created a market to consume them. In return for their consensus to buy their products, industrial designers promised consumers a prosperous and ordered Utopian end-point of material well-being. They explicitly linked happiness to material consumption and constructed, carefully and deliberately, product-based well-being. They created desire and the context for the ever-new, establishing an enduring and self-renewing spiral of material consumption that instigated the contemporary environmental crisis of over-consumption. Rather than accelerate the arrival of Utopia, the industrial designers' project merely sped up the rate of change itself. By dramatically speeding up the rate at which products are consumed they 'sped the crisis of the unsustainable'.⁷⁶

Notes

1. Roy Sheldon & Egmont Arens *Consumer Engineering: A New Technique for Prosperity* New York: Harper, 1932, Reprint Edition 1976.
2. Jeffrey Meikle *Twentieth century limited: industrial design in America, 1925–1939* Philadelphia: Temple University Press, 1979.
3. Tony Fry *A New Design Philosophy: An Introduction to Defuturing* Sydney: UNSW Press, 1999.
4. A few in business suggested that the problem should be remedied by moderating production but the most popular response, articulated by Henry Ford, was that the saturated market was the result of consumer thriftiness: the desire to save rather than spend (see Meikle *Twentieth Century Limited* 69–70). The problem was seen as one of under-consumption rather than over-production, relieving manufacturers of responsibility for the cause but offering them the obvious remedy to stimulate consumption.
5. Sheldon & Arens *Consumer Engineering* 1.
6. *Ibid.*, 5.
7. *Ibid.*, 18.
8. *Ibid.*, 102.
9. *Ibid.*, 210.
10. *Ibid.*, 66.
11. *Ibid.*, 66.
12. *Ibid.*, 56.
13. *Ibid.*, 7.
14. Fry *Defuturing* 120.
15. Sheldon & Arens *Consumer Engineering* 13.
16. *Ibid.*, 210–11.
17. *Ibid.*, p. 227.
18. *Fortune* 'Both Fish and Fowl' February Issue 9 (1934) (later attributed to George Nelson), 40–1.
19. Meikle *Twentieth Century Limited* 51 & 40; *Fortune* 41 & Shelley Nickles "'Preserving Women": Refrigerator Design as Social Process in the 1930s' *Technology and Culture* Vol. 43: 2002, 709.
20. Nickles 'Preserving women' 704.
21. Sheldon & Arens *Consumer Engineering* 18–19.
22. Harold Van Doren *Industrial Design: A Practical Guide* New York: McGraw Hill, 1940, xvii.
23. *Ibid.*, 3.
24. *Ibid.*, 44ff.
25. *Ibid.*, 50–1.
26. *Ibid.*, 28.
27. *Ibid.*
28. Sheldon & Arens *Consumer Engineering*.

29. Norman Bel Geddes *Horizons* New York: Dover, 1977 (originally published 1932).
30. Sheldon Cheney & Martha Cheney *Art and the Machine: An Account of Industrial Design in 20th-century America* New York: Acanthus Press, 1992 (originally published 1936).
31. Meikle *Twentieth Century Limited* 43–44.
32. Joseph Cusker 'The World of Tomorrow' in Harrison, H (guest curator) *Dawn of a new day: the New York World's Fair, 1939/40* New York: Queens Museum & New York University Press, 1980, 10.
33. These can be traced in the then popular Eugenics movement (see Robert Rydell *World of Fairs: The Century-of-Progress Expositions* Chicago: University of Chicago Press, 1993, 41), the euthenic orientations of Home Economics (see Rima Apple & Joyce Coleman, "'As Members of the Social Whole': A History of Social Reform as a Focus of Home Economics, 1895–1940' *Family and Consumer Sciences Research Journal*, Vol. 32, No. 2: 2003) and scientific management (see David Nye *Electrifying America: Social Meanings of a New Technology, 1880–1940* Cambridge: MIT Press, 1992) and vocationalism following the Smith-Hughes Act of 1917 (see Carma Gorman "'An Educated Demand": The Implication of Art *In the Everyday Life of American Industrial Design 1925–1950*' *Design Issues* Vol. 16, No. 3: 2000).
34. Sheldon & Arens *Consumer Engineering* 55.
35. *Ibid.*, 161 & 256.
36. Walter Teague *Design this Day: the Technique of order in the Machine Age* London: Studio, 1946, 29.
37. *Ibid.*, 46.
38. *Ibid.*, 44. By 1940, the Utopian vision was tarnished by the outbreak of World War II. Duranti's analysis of the thematic shifts over the two seasons of the New York World's Fair 1939–40 suggests that the technocratic Utopian 'World of Tomorrow' was all but abandoned in favour of a return to nostalgia by the end of the 1940 season (see Paul Duranti, 'Utopia, Nostalgia and World War at the 1939–40 New York World's Fair' *Journal of Contemporary History* Vol. 41, No. 4: 2006). Teague remains 'still optimistic' despite this, however, with a renewed post-war faith in Utopianism.
39. Bel Geddes *Horizons* 3.
40. *Ibid.*, 54.
41. In Bel Geddes' *Magic Motorways*, a more explicit concern for the uninterrupted 'flow of goods to the consumer' is expressed and was used as the argument for the need to build an efficient transport system (based on his Futurama design). While this is not directly attempting to increase consumption, it suggests that an abundant (industrial and technocratic) national future

- was dependent upon consumerism. See Norman Bel Geddes *Magic Motorways* New York: Random House, 1941, 289.
42. Detailed future narratives are in the following texts: Cheney & Cheney *Art & The Machine*, 115, 119, 226; Bel Geddes *Horizons*; Sheldon & Arens, *Consumer Engineering* 44ff, 212 227; and Henry Dreyfuss *Designing for People* New York: Allworth Press, 2003 (originally published 1955), 233ff.
 43. FT Kihlstedt 'Utopia Realized: The World's Fairs of the 1930s' in JJ Corn (ed.) *Imagining Tomorrow: History, Technology and the American Future* Cambridge: MIT Press, 1986.
 44. Howard Segal 'The Technological Utopians' in JJ Corn (ed.) *Imagining Tomorrow: History, Technology and the American Future* Cambridge: MIT Press, 1986, 133.
 45. Repeated references are made by New York World Fair planners to the exhibits' demonstration of the interconnectedness of consumers with industry and how useful products in consumers' everyday lives will deliver 'happiness' (see Pieter van Wesemael *Architecture of Instruction and Delight: A socio-historical analysis of World Exhibitions as a didactic phenomenon (1798–1851–1970)* Rotterdam: 010 Publishers, 2001, notes 152, 175, and 243). Van Wesemael provides the most detailed account of industrial designers' involvement in the Fair's planning, but the motives he attributes to them are far from favourable. He claims that their original interest in planning the fair was due to concern that they would miss out on lucrative design commissions (455), which is in keeping with his summation that their primary aim was to increase consumption to sustain their own profession (notes 80–82). He characterises the leading industrial designers as attention-seeking egotists.
 46. Roland Marchand 'The Designers Go to the Fair II: Norman Bel Geddes, The General Motors Futurama, and the Visit to the Factory Transformed' *Design Issues* Vol. 8, No. 226:1992.
 47. *Ibid.*, 27–29.
 48. *Ibid.*, 29–30.
 49. Meikle *Twentieth Century Limited* 29–38.
 50. Teague foresees a long term 'authentic style' with a 'unified pattern' of 'harmony' and 'order': 'by addressing our needs with modern tools and materials... it is inevitable that an authentic Style shall reappear in the world... we are beginning to integrate our work into a satisfactorily unified pattern'. The harmony that is spreading via design and industry 'is one of the essentials in any orderly scheme that we may carry out in the remaking of our environment'. The true, modern Style, 'is authentic only when it appears as the result of a sincere concentration on the essential factors of our problems' (Teague *Design this Day* 53).

51. Le Corbusier *Towards a New Architecture* trans. F. Etchells, London: The Architecture Press, 1959 (originally published 1927), 83–84.
52. *Ibid.*, 208.
53. Louis Sullivan, 'The Tall Office Building Artistically Considered' *Kindergarten Chats and Other Writings* New York: Dover, 1979 (orig. published 1896), 212–213.
54. Christina Codgell *Eugenic Design: Streamlining America in the 1930s*, Philadelphia: University of Pennsylvania Press, 2004, 27.
55. *Ibid.*, 28.
56. Cheney & Cheney *Art and the Machine*.
57. Bel Geddes *Horizons*.
58. Despite working largely independently, and not having received any formal training in this particular field, their methods shared much in common and were stabilised and articulated rapidly. Both Teague and Bel Geddes were able to detail their systematised methods as soon as 1932.
59. Sally Clarke, 'Managing Design: the Art and Colour Section at General Motors, 1927–1941' *Journal of Design History* Vol. 12. No. 2: 1999, 69.
60. Cheney & Cheney *Art and the Machine* 83.
61. Bel Geddes *Horizons* 226.
62. Walter Teague 'The Artist in Industry: What He Does and How He Works' *Product Engineering* 3: 1932, 247.
63. Bel Geddes *Horizons* & Cheney & Cheney *Art and the Machine*.
64. Bel Geddes *Horizons* 250–255.
65. *Fortune* 'Fish & Fowl' 42.
66. Bel Geddes *Horizons* 169.
67. Meikle *Twentieth Century Limited* 139.
68. Le Corbusier *Towards a New Architecture* 138.
69. Codgell *Eugenic Design* 29.
70. Raymond Loewy *Industrial Design* London: Fourth Estate, 1988, 74–76.
71. Codgell suggests that Bel Geddes had 'a deep-seated, long-standing desire to be considered a genius, to the extent that he consciously fashioned a modernist Renaissance-man persona for himself' (Codgell *Eugenic Design* 194).
72. *Ibid.*, 13.
73. *Ibid.*, 33.
74. Adnan Morshed, 'The Aesthetics of Ascension in Norman Bel Geddes' *Futurama' Journal of the Society of Architectural Historians* Vol. 63 No. 1: 2004, 192.
75. Codgell *Eugenic Design* 74.
76. Fry *Defuturing* 112.