

DR JEKYLL OR MR HYDE: SIGNIFICATION OF HYGIENE IN INDUSTRIAL DESIGN

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Abstract

The biggest International alliance of the profession IC-SID - Council of Societies of Industrial Design defines Industrial Design as “a creative activity whose aim is to establish the multi-faceted qualities of objects, processes, services and their systems in whole life cycles. Therefore, design is the central factor of innovative humanization of technologies and the crucial factor of cultural and economic exchange”. Nobel Prize Laureate scientist Herbert Simon in his book from 1996 - The Sciences of The Artificial [1] brings a simpler explanation of designing as “design is devising courses of action aimed at changing current situations into preferred ones”. Birth and early development of industrial design as a hybrid compilation of preceding disciplines like architecture, craftsmanship, engineering, and art, shares a similar time span where “Dr Jekyll and Mr Hyde” and/or “Frankenstein” like dual characters were born both in literature and in history. The methods and tools of industrial design aims to bring about products, services and systems that fulfills a) functional (utilitarian) needs, and b) consumption habits (sales and marketing) which resembles the conflicting duality of Dr Jekyll and Mr Hyde character combined with the qualitative and quantitative aspects of industrial era.

This paper aims to discuss also the dual character of “hygiene” as an industrial design phenomenon which is being represented through industrial products. The design examples will not only be derived from common examples in a historical timeline referring both to the development of the concept of hygiene, but also from design projects mainly based on safety and hygiene. It will also be the history of hygiene from a scientific and natural concept to artificially designed products, services and systems.

Key words: Hygiene, Industrial Design, Signification, Representation.

1. Introduction

“Did you wash your hands, darling?... Isn't it a common sentence we use or hear usually when we get inside home as if the world outside is someplace ad hoc not hygienic. It is the same instinctive sentence we use or hear when some animal, a pet for example is touched, or even we haven't used some type of cleaner for some-time, as if even the time spent without using a chemical hygienic substance is enough to get infected with some sort of microorganism. Yet, it's been about two thousand years since Roman baths were constructed; it's been more than two hundred years since Napoleon Bonaparte wrote to Josephine de Beauharnais saying “I will return to Paris tomorrow evening. Don't wash.”; and it's been more than two times 20 years since Mary Douglas wrote “anxieties about pollution arise when external boundaries of a society are threatened, or when the lines defining the internal relationships in a culture are threatened, or when dangers arise from internal contradictions within the morality of culture” [2]; and yet, 100 millions of people gathered in four sacred and hygienically dirtiest rivers of India in 2013 during Kumbh Mela (a mass Hindu pilgrimage of faith of in which Hindus gather to bathe in a sacred river. It is held every third year at one of the four places by rotation: Haridwar, Allahabad (Prayaga), Nashik and Ujjain in India). Though even in animals of different kinds behaviours regarding hygiene is evident, behavioural hygiene in humans is relatively a social and cultural phenomenon, rather than a natural one. The data, information and knowledge of thousands of disease causing organisms and cellular human defence mechanisms do not explain more than 100 millions people bathing in Ganges, but other facts do (Figure 1).



Figure 1. After 2013 Kumbh Mela, a two-month religious celebration regarded as one of the oldest the largest human gathering on Earth, six thousand cleaners were deployed to sweep up 56 tons of garbage every day and bury human waste in the waters of Sangam, the confluence of the Ganges, Yamuna and Saraswati rivers. (Source: Sanjay Kanojia/Agence France-Presse/Getty Image)

2. Hygiene as a pre-industrial and industrial concept

The prehistoric ancestors of ours seem to have behaved hygienically. Humid human and natural wastes which had potential to cause illnesses had been kept away from living areas, close contacts with the bodily fluids of others had been avoided, those who had developed signs of sickness had been isolated from healthy people, and behavioural patterns of groom to remove parasites (like shaving and combing) had all been developed thousands of years ago, before the microbial agents of infections were discovered in 18th and 19th centuries. First prehistoric tools next to the ones developed for survival such as stone axes, spears are the ones developed for hygienic reasons such as combs and even before designing first combs our Neanderthal ancestors seem to have used sea shells for removing parasites from their hairy bodies.

The history of civilization usually starts with development writing in Mesopotamia associated with transition from hunter-gatherer societies to settled agricultural ones. This transition has been called "the first wave" mainly based on taming animals, agriculture and settled organizations of life which radically changed almost everything culturally. Followed by the development of writing and numbers, alphabet and mathematics, this period has been welcomed as the beginning of human civilization in general. Consequences of this transition are countless from maternal societies to paternal ones, from polytheist beliefs to monotheist ones, from mobile small scaled tribal mobile societies to a variety of geographical settled regional states, from barter to trade, and from a food cultivation from a variety of natural resources to agriculturally planted limited varieties, which shaped thousands of years' human nutrition. Whatever the triumphs of this settled agricul-

tural civilization are, there seems to be also countless negative facts regarding food, health and medicine. According to C. M. Cassidy "the skeletal remains of hunter-gatherers show them to be much healthier than agriculturalists. Hunter-gatherers had better bones, had no signs of iron-deficiency anaemia, no signs of infection, few (if any) dental cavities, fewer signs of arthritis and were in general larger and more robust than their agriculture-following contemporaries. One of the theories as to why postulates that hunter-gatherers lived in smaller, more mobile societies. Consequently, they weren't as likely to get communicable diseases and were able to travel to find food, whereas agriculturists were rooted to one spot, lived in larger groups, making the spread of disease more likely, and they were subject to lack of food if a drought or other natural disaster decimated their crops." These suggestions depend on a comparative study of archaeological findings of 285 hunter-gatherer and 296 farmer skeletons revealing the fact that hunter-gatherer societies were in a much more better condition than the farmers in terms of nutritional richness and health. Apart from infant (not even child) mortality and evidence of growth arrest, our hunter-gatherer ancestors have performed better in terms of child mortality, average life expectancy, evidence of iron deficiency anaemia, evidence of infection inflammation in bones, and tooth decay and/or abscesses (Table 1), [3].

Table 1. Comparison of hunter-gatherer and farmer skeleton remains in terms of nutrition

| | Hunter-Gatherers (285 skeletons) | Farmers (296 skeletons) |
|--|---|--|
| Infant mortality | higher, birth - 12 months | lower, birth - 12 months |
| Child mortality | 44% died before age 17 | 54% died before age 17 high death rates ages 1 - 4 |
| Average life expectancy | at age 18, life expectancy is age 36 | at age 18, life expectancy is age 30 |
| Evidence of growth arrest | present in higher numbers evidence of regular, brief periods of seasonal hunger | present in lower numbers evidence of irregular periods of longer duration (famine) |
| Evidence of iron-deficiency anemia | absent | present in 50% of children under 5 years old |
| Evidence of infection inflammation in bones | present in lower numbers | present in higher numbers |
| Tooth decay, abscesses | low rate, average of 1 caries some tooth loss in old age due to wear | high rate, average of 7 caries tooth loss in children |

The pre-industrial period of the first wave starting by agriculture and writing covers both ancient times from 3500 BC to 500 AD, and from 500 AD to 17th century in western history, and the second wave, which corresponds to the industrial era usually starting from 17th and 18th century and covering 19th and 20th century witnesses the steps improving habits of hygiene and its applications in the form of industrial design. The initial aim in developing hygienic methods regarding nutrition, to reduce the number of deaths from infectious diseases and to avoid infection which can also be observed in nature in different forms and in humans as an instinctive natural behavior transformed itself into a professional scientific engineering and design activity for consumption. The industrial era not only witnessed the birth of industrial design profession, but also the development of hygienic engineering and design as a professional scientific discipline. Starting by the discovery of microbial agents of infections by Robert Koch, Louis Pasteur, etc, followed by the developments regarding preservation of foods not only brought about the acts and legislations but also grounded a scientific and professional discipline of food safety and hygiene. By coincidence the developments in hygiene and food sanitation went hand in hand with the developments in industrial methods of production and industrial design. Especially the second half of 19th century witnessed a race of two seemingly apart disciplines (Table 2):

Table 2. Random developments in hygiene and industrial design

| 19th Century (1850-1899) | |
|---|--|
| For every year you can find some development either in industrial design or hygiene as randomly selected below. | |
| Hygiene and Food Safety | Industrial Design |
| 1850 - British scientist John Tyndall developed the tyndallization process for germ reduction in heat-sensitive foods | 1851 – Crystal Palace: The Great Exhibition of London |
| 1855 - Friedrich Küchenmeister discovered the relationship between pork tapeworms in humans and the parasitic infection <i>Cysticercus cellulosae</i> | 1855: Henry Bessemer invented process for making cheap steel from pig iron. |
| 1860 - Friedrich Albert Zenker proved the infectiveness of parasitic trichinae roundworms | 1860: Due to fast increase in the speed of industrially produced vehicles, Road Locomotives Act restricted speed of road vehicles to 5 mph. |
| 1860 – Adulteration of Food Act | 1876: Alexander Graham Bell (1847 - 1922) patented the telephone and Singer Cooperation became the first international industrial organization selling goods in Europe |
| 1864 - French chemist Louis Pasteur invented the pasteurization process for the preservation of food | 1884 – Frederick Taylor began industrial factory management in Midvale Steel. |
| 1872 – Adulteration of Food, Drink, and Drugs Act | 1896: Henry Ford manufactured his first motor car |
| 1895 - Carl von Linde developed a cooling process to preserve food | |

Next to the peak of the developments in food hygiene and industrial design in the 19th century we see totally a new kind of criminal and a new type of literature. Accompanied by high rates of crime emerging in newly established industrial cities by serial killers like Jack the Ripper of London in 1888, or Dr Henry Howard Holmes of 1893 Chicago World Trade Fair which has been regarded as symptoms of industrialization of 19th century, a new fictional literature also emerged with fictional characters like Mary Shelley's Frankenstein and Robert Louis Stevenson's Dr Jekyll and Mr Hyde. While *Frankenstein* (1818) appeared as a doctor who designed and created some sort of evil with scientific methods and totally good will, originally published as *Strange Case of Dr. Jekyll and Mr. Hyde* (1886 - Figure 2), it was the story of transformations from good (Dr) to evil (Mr), and vice versa within the same person. It is significant that good will in Frankenstein and good personality in Jekyll/Hyde were represented as doctors (aka scientist) in both stories while the serial killer of 1893 Chicago World Fair (Figure 3) was also a doctor [4].

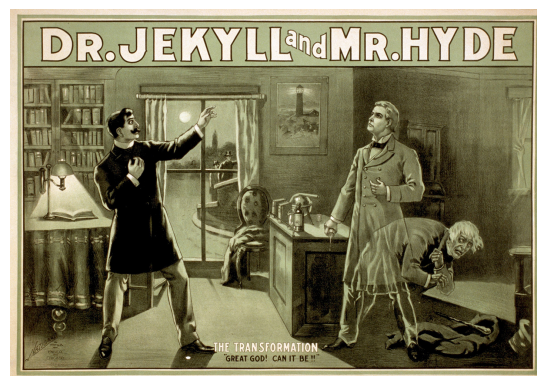


Figure 2. Dr. Jekyll and Mr. Hyde Poster from 1880s (Source: Wikimedia Commons)

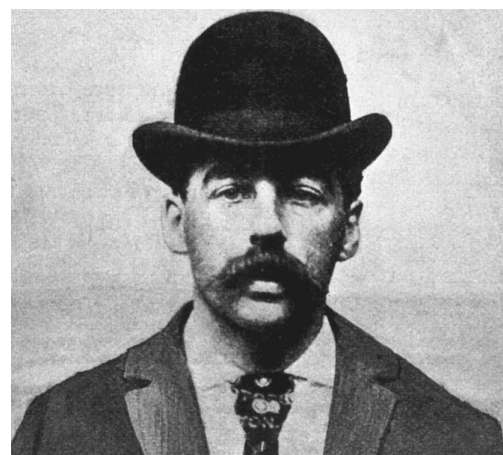


Figure 3. Dr Henry Howard Holmes so called first documented serial killer of America during 1893 World Fair in Chicago (Source: <http://murderpedia.org/male/H/h/holmes-phtos.htm>)

Seems like spread of plague like diseases and deaths in masses were far more than the effects of scientific cures developed at the same time and people had reasons not to welcome modern science and technology and their applications as industrialization at the beginning. Corruption in society, economic and social problems, ideological polarizations in 19th century made science and technology a questionable issue rather than a welcome cure. Like the critics industrialization ruined culture and society machines were regarded as ruining design at the same period. Art and Crafts movement of William Morris well reflect this reaction towards industrialization of design. He puts his ideas against industrialization with words like "So long as the system of competition in the production and exchange of the means of life goes on, the degradation of the arts will go on; and if that system is to last for ever, then art is doomed, and will surely die; that is to say, civilization will die" [5]. The blaming of science and technology hand in hand with blaming machinery for bad design continues until 1920s in all forms of criticism in literature. If Mary Shelley's Frankenstein represents the beginning of this era at the beginning of 19th century, H. G. Wells' The Island of Dr. Moreau puts an end at the end of the century in 1896. The plots of Frankenstein like interference with nature, creation of evil with science and technology, and a scientist to blame all can be well traced in this novel too. 19th century not only witnesses all these conflicts of science and technology but also the scientific birth and applications of hygiene in society by industrial design. In the years starting from Frankenstein in 1818 until The Island of Dr Moreau in 1898 especially in Europe and America industrial design applications of hygiene were applied in an increasing manner. Following the initial aim to reduce the number of deaths and illnesses from infectious causes of poorly established living and mainly working conditions, the end of 19th century saw significant reduction of the incidences of typhoid and cholera because of better water and drains, but an increase in infant mortality because of other diseases particularly tuberculosis. The microorganisms, mainly exposed by the works of Louis Pasteur and Joseph Lister in 1860s focused the attention to anything that might carry these microorganisms like dirt and dirt became a potential suspect and even a paranoid source of disease. From 1890s on schools began to teach hygiene, schools of motherhood were established, propaganda about cleanliness and against dirt were employed by either state or private organizations like Women's Institutes of different nations, and the message of hygiene thus carried into the people's homes and individuals (Figure 4). According to Adrian Forty, the campaigns for improving standards of hygiene, two sets of arguments, one depending on scientifically proven facts about disease and microorganisms but the other one totally emotive depending on paranoid feelings of anxiety and guilt about dirt were

employed [6]. It was something like the emotive aspect was ruining also the rational scientific aspect as in the case of Dr Jekyll and Mr Hyde character. In a book on household management published in 1906, Augusta Moll Weiss was to write "an object may be said to be clean when it is free from all stains and all dust. To struggle against dust, to remove it, whether from the surface of the body from furniture or clothes, whether cleaning the floors or renewing the atmosphere, is to do the work of the hygienist, fulfilling more of the essential tasks of the housewife" [7] Thus, the housewife was to turn into a scientific operator of hygiene by employing industrial consumer products in the market economy, and the house was to turn into a space which should be freed from the dust and dirt of outside world and nature. Hence, the question "did you wash your hands, darling" started make sense with the isolation of inside from outside, artificial from the natural. Not only the natural avoidance of infectious waste turned into a scientific industrial operation of products and services, but also anything left unattended by a hygienic product or service transformed into a source of infection. Needless to say, for the last more than a hundred years, marketing commercials and advertisements of industrial products and services as well as developing network of information flow and media (Figure 5) have more success in delivering the idea of hygiene more than the scientific hygiene education and the hygienists themselves.

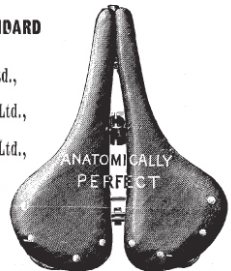
THE

"PATTISSON"

HYGIENIC cycle SADDLE

ADOPTED AS STANDARD
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ELSWICK CYCLE CO., Ltd.,
SWIFT CYCLE CO., Ltd.,
JOHNGRIFFITHS CYCLE
CORPORATION, Ltd.,
Etc., Etc.



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AND GIVES
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FROM A LADY:
"The Saddle has enabled me to ride very much farther than I could on any other I have tried, and I have tried many."

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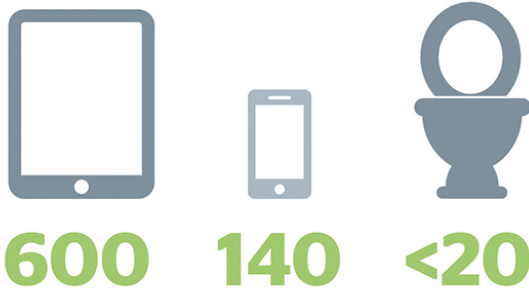
HUMBER & CO., Limited,

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CYCLE REPAIRING & ENAMELLING WORKS:
BLENHEIM STREET, BOND STREET, W.

Figure 4. Pattison Hygienic Saddle advertisement from 1898
(Source: The Online Bicycle Museum - www.oldBike.eu)

How clean is your tablet?

How much bacteria we found on the worst tablet and smartphone we tested, and an office toilet seat*



*Staphylococcus aureus
(amount in units per swab)

Which?

Figure 5. Which? Survey.
(Source: Blogs.Which.co.uk)

3. Conclusions

- ICSID - International Council of Societies of Industrial Design defines Industrial Design as “a creative activity whose aim is to establish the multi-faceted qualities of objects, processes, services and their systems in whole life cycles. Therefore, “design is the central factor of innovative humanization of technologies and the crucial factor of cultural and economic exchange” [8]. This not only professionally but also academically accepted definition of industrial design gives the discipline its innovative, cultural and economic values. We see the same innovative-cultural-economic values in the hygiene definition of S. William Gunn in his “Dictionary of Disaster Medicine and Humanitarian Relief”: The principles and methods of sanitation applied to the quality of foodstuffs, to their processing, preparation, conservation and consumption by man [9]. Both definitions, while putting their subjects in a framework of economic activity of consumption, they are also excluding anything designed or hygienic if they are independent from this context. Maybe that’s why we think that knowledge, information, and data are far more important than wisdom so that we can measure the values,
- Today though we still lack an understanding of how human beings brought about natural behavioral patterns to avoid infection before the scientific discoveries and methods were discovered, thanks to science and technology we know a lot about thousands of microorganisms and their infectious behaviours. Our confidence in the science of hygiene delivered in the form of industrial products and

services is far more than the times hundred and fifty years ago, and even, we can’t resist hygienic products and services pretending to be more efficient with every so called scientific development and application. Seems like the evil creation of Dr. Frankenstein has been evolved into good and even into an irresistible form of design in two hundred years of scientific industrialization, while hygiene, natural set of human behaviours to avoid infection has also been transformed into either an industrial product, or a service, engineeringly designed. What we haven’t answered yet is the question either Dr Jekyll or Mr. Hyde was the evil one.

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