Cumulus Mumbai 2015:
In a planet of our own - a vision of sustainability with focus on water
http://www.cumulusmumbai2015.org/

Plasticized Water

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Abstract: This paper deals with the enormous environmental problems that are caused when waters, from small creeks to oceans, are polluted by plastic garbage. In the realm of design solutions, recyclable plastics as well as new organic plastic like materials are welcome contributions from progressive designers, for instance "corn plastics", but still the most important issue would be to change the producers´ and the consumers' attitude to plastic/ plasticized packages.
Key words: Oceans, Plastic garbage, consumption, visuality,

1. Introduction (11pts, 1.5 spacing)

Since the wonder material plastic was invented more than hundred years ago it has had far reaching affects on the way we use and consume products. As a backbone in the development of industrial design during the last century, it became an enabler for the improvement and dispersion of new products, but it also became a catalyst in a liberating process, since it made life easier for human beings. Depending on who we are, and where in the world we live, plastic materials are an important part of our everyday life. It's hard to even imagine a world without plastics. On the other hand, it's also hard to imagine a solution for the gigantic environmental problems that are caused when waters, from small creeks to oceans, are polluted by plastic garbage. In the realm of design solutions, recyclable plastics as well as new organic plastic like materials are welcome contributions from progressive designers, for instance "corn plastics" (Lamb, 2008), but still the most important issue would be to change the producers´ and the consumers' attitude to plastic/ plasticized packages.

2. The situation as such

When talking about plastic materials, issues concerning sustainability are unavoidable. Above all the medical effects of, for instance, plastic softeners are well known. Two of the most harmful chemical additives to make the plastic more pliable are bisphenol-A (BPA) and phthalates (a group of chemicals used as a plastics softener). These additives are known to cause hormone disruption, cancer, infertility, early puberty, obesity, behaviour changes, and reproductive system damages (Huke, 2015). On another level, easily recognizable in everyday life, some plastic products are literally unsustainable when they easily break and are unrecyclable. Other plastics just take the role to be an additional material when it is used in packages and wrappings of different kind. As consumers we have very limited interaction with these plastic packages and wrappings. Containers for often-doubtful reasons with a product short life cycle, they fulfil their mission and are soon discarded - we are left with heaps of useless material.

Figure.1 Trash bins do not fit the increased use of plastic packages (photo L-H Stahl).

For the last few decades, the use of plastic packages has avalanched without control. Food, toothbrushes, batteries, household equipment etc., are heavily plasticized in packages. The discarded packages are in turn leading to waste piles and non-recyclable material. In worst, but frequent cases, plastic packages and wrappings find their way into the oceans, where they become a threat for animals, plants and our planet in general. In some places this effect is palpable, since it’s turning the oceans into the world's biggest landfill. There are even more serious problems. Plastic never completely biodegrades, but with the help from sunlight it breaks up into very tiny pieces ("photodegradation"),

fragments that actually still are plastic. These pieces are so tiny, that they are ingested by over 180 known marine species. (European Comission, 2015) When plastic are mistaken for food it will unavoidable also entering the food chain and will by that also ending up in our food.

Today no one can ignore the debates caused by The Great Pacific Garbage Patch (GPGP), a layer of rubbish that could be found in the Pacific Ocean. This ”plastic area” has been growing since the 1950s. The Great Pacific Garbage Patch is a vortex of whirling streams that are pulling trash from the world's oceans. The GPGP is floating between California and Hawaii. It is the world's largest landfill. According to estimates it has pulled 3.5 million tons of trash and spans 3.43 million km2, or the size of Europe. A similar garbage patch could also be found in the Atlantic.

Figure.2 Led saving light bulb packed in an unsustainable material (photo L-H Stahl).

3. The mission of plastics?

There are evident reasons why plastics became a well-integrated part in the development of our society for the last half-century. Not least when it comes to packaging, this material provides, for instance, tamper proof and hygienic protection, but also a fancy cover that also brings the possibility to show the content in an appealing way. Recent research also highlights environmental paradoxes in the usage of some plastic food packages (Bertoluci, Yann, Olsson, 2013). In a comparison between three different ways of packing and retail olives (glass jar, steel can and doypack), the non-renewable “doypac” made of plastics is

the product that gives less environmental impact than the steel can or the glass jar, when a LCA analyses is applied. The study was carried out in five different EU-countries, where also different recycling logistics could be found. LCA (Life-cycle assessment) is a technique where environmental impacts associated with all the stages of a product's life from cradle to grave are considered. LCA analysis can obviously help to widen the outlook on environmental concerns. In an even wider perspective, the usage and transportation of different types of food can certainly be questioned. Beside different types plastic packages for food, an even more dubious issue concern the usage, or over usage, of plastics as a container for items such as toys, household and electronic devices. Here the question must be raised of whether consumers in general really want these packages, or why they want them.

Before turning to a more elaborated discussion about preferences and aesthetics as implementations in the usage-chain of plastics, it's important to mention designers and companies that strive for sustainable plastic solutions and alternatives. One example is The *Ecover Ocean Plastic Project*. Aligned with this project, there is a special edition from Ecover called "Ocean Bottle". This special bottle for washing up liquid is made from 10% recycled Ocean Plastic, whereas 90% is recycled from other sources. Ecover claims that "The Ocean Bottle represents a big step both in raising awareness of Ocean Plastic and also beginning the process of prevention and a cleaning of the oceans across the world" (Ecover, 2013). Even if Ecover's *Ocean Plastic Project* is well intentioned and above all could take the function of an exemplar for other companies, enormous efforts must be made to clean the oceans. Beside the avoidance of harmful types of plastics, cleaning is the only way to prevent the world from a global environmental catastrophe. Recently, huge attention was paid in media concerning the group *The Ocean Cleanup*, founded by a young activist, Boyan Slat. The unique principal argument from Slat is that the Garbage Patches in the oceans could be cleaned up in only five years. This should be compared to other experts' ideas that it should take 7000 years to fulfil this mission. In short terms, the clever concept, invented by Boyan Slat is a reversed solution, where he claims that the ocean garbage patches are able to be "self-cleaning", i.e. the plastic garbage comes to a well designed infrastructure of cleaning mechanisms, instead of the opposite. Thanks to the storms and magnificent turbulence, a huge area of the garbage patches slowly moves towards a network of collecting apparatus. The future will show whether this project will work or not, but so far it's one of the few promising attempts that have been proposed to solve an enormously complex environmental problem.

4. The visual double bind

The Great Pacific Garbage Patch was discovered between 1985 and 1988 by several Alaska-based researchers in the North Pacific Ocean. Why that late? The answer is connected to the concept of visibility. The ocean garbage patches are located thousands of miles from populated areas, and are somehow hidden. The problem entails a long human tradition of hiding, where rubbish has been dumped into many different water courses. In essence, what you see is there and what you do not see is not there. Even if the plastic garbage, in most cases, was not dumped into the water on purpose, the natural environmental circumstances (wind, huge unpopulated areas etc.) can account for our ignorance of what actually is out there in the sea. As a parallel problem, different types of plastics break down to tiny harmful particles that not are visible. This problem is even worse since we not can see these particles, while they also are distributed in the food chain system.

Figure.3 Typical lunch salad distributed in plastic package (photo L-H Stahl).

Turning to the opposite side of the plastic packages' life cycle, when their appearance still supports the psychology of freshness, the visual qualities have a profound impact on the consumption of different types of commodities. Why is it important to clearly see the encased items through transparent plastics, while you not are able to touch it? For expensive goods it has certainly to do with their value and the shopping rituals they are surrounded by, but these shopping rituals are also disseminated to all items that could be bought or come as a gift with magazines etc. Here we are in the very beginning of research

about the visual rhetoric that convinces the consumers to prefer unnecessary plastic packages. But an investigation into this type of rhetoric can also contribute to the awareness of the plastic problems. Ecover's bottle made of 10 % recycled ocean plastics might have marginal effects on the reduction of the plastic garbage packages. Its value rather concerns a didactic dimension that makes people pay attention to the ocean plastic problem. The same could also be said about different design- or art projects that show something important about the management of plastic garbage patches. One example is the Brighton based designer Stefano Santilli, who in some recent projects have worked with plastic material found on the beaches near Brighton. Santilli claims that "there is an abundance of resources freely available, often that have already circumnavigated the globe on their technological journey from extraction to processing as manufactured goods". His interest is in how the unpredictable palette of found materials can influence creative decisions and how the forms of discarded objects can be appropriated as a strategy for co-design.

Santillis' initial source was the roadside verge, where it is possible to find car crash polymers and discarded aluminium drinks cans. The first experiments were to shred and reform ABS and Polycarbonate, taking advantage of the polymers capacity to flow into hand made injection molding presses – converting problematic waste into precious furniture detailing. Using a crucible furnace, the aluminium was hand cast into joining wedges. Interestingly, this process caused each form to be unique and circumvented aesthetic control as a designer. From this point, Santilli decided to explore the idea of co-design, 'going with the flow' of materials and taking advantage of the design input that had already been applied to objects. ABS wing mirror covers were a typical roadside find and curiously comparable with pottery fragments of classical archaeology – each with markings that can be decoded to identify date and place of origin. Through a process of 3D scanning and simplifying the resultant complex polygonal geometry towards a model that could be unwrapped, Stefano Santilli was able to CNC mill and recreate the forms as wooden vessels. Each panel was steam folded and riveted together using scraps of found polymer as a hybrid construction of digital and manual techniques. This reflected both the intelligence of the digital tools to process data and, in another sense, the dumbness of computer logic.

The second source has been the shingle beach at Brighton, where typical material finds are polymer waste left by holidaymakers and eroded timber from sea defences. Using similar digital processes and assembly with polymer rivets, but now making use of the vessel form's acoustic potential and incorporating soundscapes that were recorded on location – as an additional resource that is freely available.

Figure.4 Contemporary findings from a sea shore (photo S. Santilli).

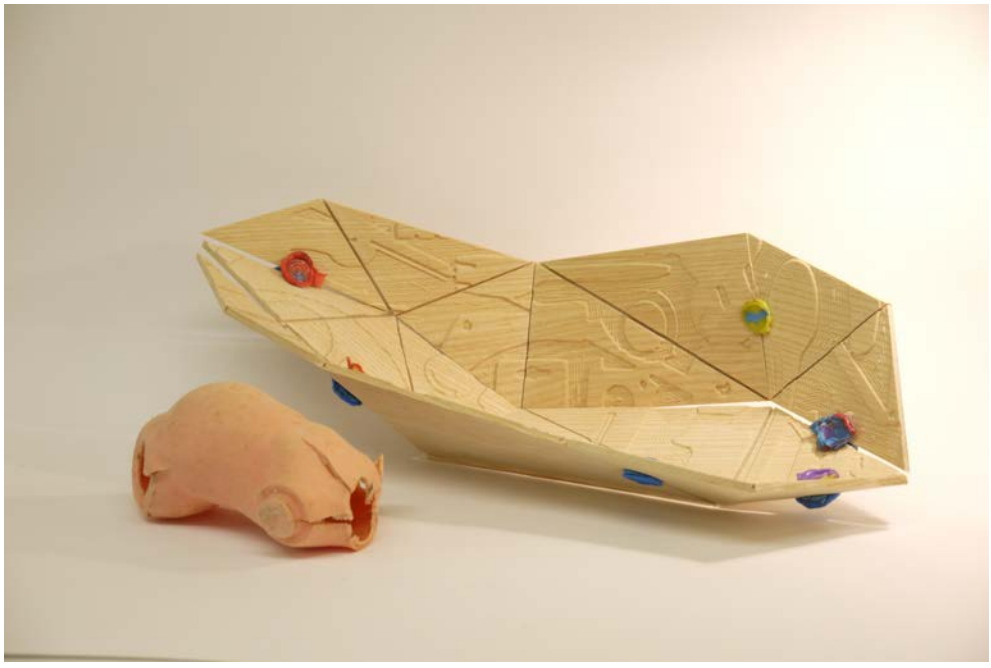

Figure.5 Work by Stefano Santilli (photo S. Santilli).

6. Conclusions

The Great Pacific Garbage Patch was first recognized about thirty years ago. Since then the use of plastic packages has avalanched out of control. Food, toothbrushes, batteries, household equipment etc., are heavily plasticized in packages. The environmental impact and subsequent problems caused by these processes are doubtless among our planets

biggest challenges for the future. There are promising initiatives such as *The Ocean Cleanup project*, where the ambition is to taking care of plastics infested waters. Even if we don't know if this project will manage or not, there is a corresponding problem that has to be solved. This problem has rather to do with the psychology behind attitudes that convey plastic imbedded items. Here the most important strategy, beside information about The Great Pacific Garbage Patch, must be to even more carefully investigate consumption attitudes that so far have resulted in unnecessary plastic embedded commodities. Only by this joint strategy, i.e. to physically clean up the polluted waters and change attitudes concerning the use of plastic packaging, are we able to reduce the waste materials in our oceans.

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