

Report

PHEA – The Plastics Heritage European Association. Hipoms – Historic Polymeric Materials.

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On 08/09 January 2018, **PHEA**, the *Plastics Heritage European Association* was founded in the Brussels Design Museum ADAM.

Coming from 10 European countries, 18 representatives from different organisations (universities, museums, national societies) decided to establish PHEA, the Plastics Heritage European Association.

PHEA's intention is to build up a network of European organisations with the focus on activities relating to and the research on plastics heritage and 'Historic Polymeric Materials' ('*Hipoms*')

- Members can be European organisations and institutions which on invitation or application agree and are capable to fulfil the **PHEA** activities and the Regulations.
- Activities include creating a network and facilitating the cooperation among the member organisations and

institutions (legal or non-profit private institutions like: universities, departments, collections, museums and societies), which are involved in the research, development, evaluation, popularising, showcasing, preservation and conservation of our common cultural, technical and scientific heritage of historic polymeric materials and objects therefrom.

- to communicate, exchange and popularise mutually the manifold, special knowledge and abilities of the **PHEA** members.
- to apply for funding programmes e.g. a European COST network on historic polymeric materials and objects.
- to initiate applications for the exchange of students, researchers and for research cooperation.
- to organise and realise the biennial international '**PHEA Plastics Heritage Congress**'.

- to encourage publishing in the international Journal of Plastics History **e-plastory**.

Hipoms comprise historic polymeric materials in art, design, architecture, ethnology, in science, technology, industry, companies and in past and present daily life. It consists of formed materials, fibres, lacquers, binders, adhesives.

Hipoms emerge in three main groups:

- Natural as e.g. amber, pitch, bitumen, proteins (albumen, blood protein, casein, horn, leather etc.), copal, shellac, other natural resins and gums, vegetable and animal glues, natural lacquers, natural fibres.
- Semi-synthetics as e.g. rubber, hardened rubber, casein-formaldehyde (CSF), cellulose nitrate (CN) and cellulose acetate(CA).
- Synthetics as e.g. early thermosets: phenol formaldehyde, urea formaldehyde, early thermoplastics: polyvinyl chloride (PVC), polymethylmethacrylate (PMMA), polystyrene (PS), polyethylene (PE), polyamide (PA), polyacrylonitrile (PAN), polyurethane (PU), polycarbonate (PC), polyester (PES) etc.

Because of the scientific similarities between natural up to synthetic plastics (macromolecules, solution properties and softening/melting behaviour, crystallinity, analytical characterisation, degradation principles, adhesive and lacquer properties etc.), we can regard all polymeric materials as an entity. They are much more closely related as we often may assume, even if this may be somewhat surprising to many people.

Franz Patat,^[1] one of the protagonists of early technical-chemical polymer science in Germany, stated as early as in 1959 (translated): “*The denomination* (author: German ‘Kunststoffe’) *is actually highly unfortunate, because ‘Kunststoffe’* (author: artificial material, plastics) *are neither artificial ‘Ersatzstoffe’* (author: surrogates) *like artificial honey, nor have they anything to do with art* (author: Kunst). ... *In fact, their denomination being*

derived from artificial instead of natural material is all the more arbitrary. ... The connection between natural materials, like cotton, wood, casein, etc. with plastics, due to their in principle similar structure and organisation, is the reason why plastics started out as modified natural products and that they - today mostly 100% children of the chemical retort - exhibit substantial ancestors like leather, rubber and linoleum”.^[2]

From at least 150 years onward, innumerable artefacts with *Hipoms* can be found in science and technological museums and in the collections of museums of design, art and architecture. To understand the dimension and importance of *Hipoms* with respect to our cultural history, an intensive research on the historical, technological, contextual, social and economic role is urgently necessary. The investigation of different properties and their characterisation elucidates the tremendous knowledge hidden in the material and the objects made from. This constitutes the preconditions to understand the significance as cultural heritage and its preventive and practical conservation.

To share and celebrate these activities, to disseminate new findings and to make aware not only the waste challenges of plastics but also the cultural heritage role of ‘historic polymeric materials’ to the broader public, **PHEA** will become active.

Since their emergence, polymeric materials and their precursors have generated quite different feelings and opinions. On the one hand, especially during World War I, they were often recognised as cheap mass products, partially replacing valuable or rare materials (‘Ersatzstoffe’). On the other hand, they established from the beginning, their fundamental role as developers of many important technical advances, as demonstrated in the electrical industry as well as many others. Without these new materials, modern civilisation and social progress of mankind would not have been possible. Today, synthetic plastics such as moulding materials, rubbers, fibres,

lacquers and adhesives are ubiquitous. Their effect on consumer societies is linked with the technical progress but also with increasing environmental impacts. Plastics in all its variations plays a tremendous role in our daily consumer life, in high-tech developments but also in environmental matters.

We all know that plastics are ubiquitous, in a double sense.

On one side, their influence on modern consumer society is connected with an enormous technological progress related to daily goods and high-tech products. We could no longer imagine synthetic polymeric materials aren't there: who would like to miss his smart phone, laptop, modern sports textiles, skis and skate boards, flight trips with modern aircrafts, and finally who would like to replace dental acrylic inlays by amalgam?

On the other side, there is the ubiquitous waste of plastics packaging. And the warning bells should really ring in everybody's head! It is not only a question of separation, incineration or recycling in some regions, but also a challenge with respect to social and economic possibilities in other regions of our common world.

In this area of conflicts, no other materials group has ever caused so strong emotional reactions of refusal and approval, hate and love.

Hipoms are cultural heritage materials, plastics packaging waste not, for sure.

We are responsible to shed more light on this antagonism.

PHEA will take part.

References

- [1] Prof. Dr. Franz Patat (1906-1982), from 1956 until 1970 head of the Institute for Chemical Technology, Technical University Munich, Germany.
- [2] Franz Patat, *Die Welt der Kunststoffe*, Universitas - Zeitschrift für Wissenschaft, Kunst und Literatur, 14 (1959), p. 1187-1194.