The Innovative Lightweight Buildings and Systems of Jean Prouvé

Advancements for Metal Buildings Congress 08

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Jean Prouvé 1901-84

- Designer and manufacturer
- Innovator in materials and processes
- ‘If aeroplanes were designed the same way as buildings they would not fly’
- ‘Above all, one should not sketch utopian projects because evolution can only result from practical experience which speeds it on its way’
- One should design merely what can be executed but always in the most advanced way and without recourse to imitation’
Early work
Jean Prouvé

• ‘It may well be that the present formula which consists of displaying a drawing and requesting a builder to follow it is the root of our present decay’

• Working sequence
  – An idea
  – A dialogue on the spot with associate by means of highly technical sketches
  – Prototype or model
  – Assess trial, test, correct and only then a plan is drawn
Attitude to Industry and professions

- Concerned about craft, ‘An honest approach must lead to that osmosis of science, the mind and craft’.
- Saw industry as opportunity to solve housing projects.
- The separation of design disciplines and organisations has detrimental influence. - design in isolation from manufacture.
- ‘If the architect is not integrated into the industry, industry will continue without him’ Human factors must always be accounted for.
- Architects place reservations on design, ‘I would have liked to but..’
- Architect or engineer? Why ask the question building is what matters.
Prouvé

• ‘I noticed two things, one of these was the intense interest by technicians in the purely technical aspects of my projects, regardless of their content. The other was the equally intense interest shown by architects and users who saw in my projects an opportunity to modernise solely for appearances sake’
1928

1928/29 L'Hôtel de l'Ermitage
Roland Garros Aero Club

- 1936/37
- Flying club of Roland Garros at Buc, near Versailles
- Collaborated with Beaudouin and Lods
- Complete construction made in Prouvé workshops
- Prototype developed
- Structural frame made from folded sections of 4 mm thick steel sheet; including floors and ceilings
- Cladding made of folded steel
- Roof of folded sheet steel
- No standard components
Fig. 12. Vue en plan.

Fig. 13. Coupe longitudinale.

Fig. 14. Coupe transversale. On note la disposition particulière de la cheminée.
Folded steel structural components
Folded steel panels
Maxéville factory

• Factory opens in 1947
• Aluminium Francais provides capital for factory of 25000m2 for 200 workers.
• A pilot for working methods, the architects, workmen, foremen were all associates.
• Conditions
  – Guarantee minimum wage based on collective agreement
  – Share in team profit
  – All share in cost saving
• Prodigious activity, experimental buildings, furniture, facades.
• Unfortunately the new men did not understand the spirit of our new creation. They had discovered an architectural style which made commercial sense and would lead to mass production of elements adaptable for use in any kind of architecture.’
• 1954 Jean Prouvé forced out from factory, moves to Paris
Maxeville layout

4 storage
5 production
6 finishing
7 furniture
8 storage

3 Prouve office
2 architects
1 offices
furniture

• ‘There is no difference between the construction of an item of furniture and that of a house’
• Furniture cannot be made on the drawing board
• Decide on the detail via the prototype
• Extensive production
• Stopped designing furniture in 1950
Maxeville working methods
Meudon Houses

• Competition for sectional buildings for military airfields
• Idea revived after the war to house the homeless in rural areas
• 1200 houses 6 by 6 metres in plan were planned by French Ministry of Construction
• Each house delivered by a single truck and assembled in one day by four men
• All components light and handled by one man
• Cladding interchangeable on the facades, solid, window, translucent
• 25 houses built but delivery instructions from Ministry never come
• Some houses placed in Meudon Park.
• ‘I am certain, despite a generally accepted preconception, that the masses instinctively recognise what is beautiful; moreover they are capable of analysing their reactions’
• Cladding interchangeable with solid, window, door or aluminium panels
• Not traditional
Meudon Houses 1949
Meudon House - assembly
Piliers principales constituant la structure.
Meudon Houses 1949
Tropical Buildings

• 1949 transportable aluminium and steel buildings for tropical climates
• Housing transported by plane
• Designed to allow for natural ventilation and cooling
• Simple assembly
• Layered construction
• Adjustable louvres
Tropical house - assembly
Tropical house today
Sahara building 1958
Currently at the TATE modern

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.
Maison du Peuple

- 1938 Clichy District of Paris
- In collaboration with architects Beaudoin and Lods
- Civic and cultural centre
- Market
- Auditorium for 2000 people
- Cinema 500
- Flexible, adaptable space,
- 1st floor moves, roof opens, removable partition
- Cladding
  - Glass and metal facades
  - Spring loaded panels
  - Uses maximum metal sheet size 1.2 by 4.0 metres
- Listed as historic monument in 1983
Maison du Peuple - schematic
Maison du Peuple
Maison du Peuple

Organisation of floor
Maison du Peuple Roof
Maison du Peuple roof opening
Maison du Peuple - movable floors
Maison du Peuple renovated facade
Youth centre 1966
Youth Centre

- Paris 1966
- Competition
- Building to be assembled by club
- Aluminium and plywood sandwich construction with foam insulation core
- Simple connections
Youth Centre
Youth Centre

Connection details
Youth centre 1966
Mozart Place 1953
Aluminium Pavilion

1952 Built to commemorate centenary of aluminium

Originally on bank of Seine, Paris, now at Parc Des Expositions Paris

Totally integrated structure and cladding etc.
Aluminium Pavilion
Prouvé

• Believed in industry-technology
• Enlightened employer
• Innovator in metal, facades, buildings
• Did not believe in component (catalogue) architecture
• Rejected uniformity - not an inherent consequence of industrialised construction
• Influenced many architects (Foster Grimshaw etc)