



International Scientific Conference Urban Civil Engineering and Municipal Facilities,
SPbUCEMF-2015

Rainwater Systems in the Context of an Architectural Image

Inna Zayats^{a,*}, Vera Murgul^b

^a*Saint Petersburg State University of Architecture and Civil Engineering, Vtoraja Krasnoarmejskaja ul. 4, St. Petersburg, 190005, Russia*

^b*St. Petersburg State Polytechnical University, Politekhnicheskaya ul., 29, Saint-Petersburg, 195251, Russia*

Abstract

Utilitarian elements of building are important part of architectural creating. We can find various examples rainwater systems from ancient to nowadays. There were different roofs, simple gutters, downspouts and channel outs. A lot of examples were as uncial decorative elements of buildings and could characterize any architectural style.

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the organizing committee of SPbUCEMF-2015

Keywords: The history of architecture, architectural forms, utilitarian elements and details of buildings.

1. Introduction

Architecture have been called solidify music. Certainly its elements and details are like musical notes, if we see an architectural structure as a musical creation.

Architecture consists from “notes”, strokes, a rhythm, a rate or a dynamic and an esthesia just like every music composition. Emotional condition and aesthetic impression originate in connecting all elements. The emotional force of the building depends on how right and how original an architect punctuate all marks beginning from creation a space-and-planning composition and then making details, actions and elements using different architectural, stylistic, decorative and artistic methods. Consistent pattern construction of forms is not only the result of a creative way of architects and builders but first of all it consists in goals and missions of architecture, own function, the reasonability of a predestination.

* Corresponding author. Tel.: +79052237625, +7 812 3161568.

E-mail address: i.vvv0302@gmail.com

It depends on the nature conditions and the climate too, the national traditional and the architectural tendencies, the building materials which are given by the nature of different regions.

But a main task is own making a favorable situation for a people's life independent of the climate in which a process of architectural creation goes on. Every building - a house, a church, a railway station, a theatre - is first of all roof over a heard, a shelter. Nature forces to people to build a first covering. And in turn the creative potential of people has developed, improved and found new forms of satisfying utilitarian as well as aesthetic needs. Water is one of a nature's elements which have a great role in organizing the living space of people, but a man has ambiguous relation with it.

Historically, considering water as simply the origin of everything has been a philosophical axiom of ancient universe. Robert Boil (1627–1691) wrote: «... the chaos, from which everything was born, the material foundation of the Universe, was water» [1-6].

2. Building storm drain

Anyway the bringing life water can be deleterious force. To some extent people had began to build own first houses saving from it. «At the beginning they stood forks, bound them by branches and coated these walls by clay. Others built walls from dry cobs of clay binding them above by wood, and covered by a cane and foliage for protection from rain and heat. After this so far as such roofs couldn't withstand rains of winter bad weather they began doing batters and deflected water on coating with clay tilting roofs», - Vitruvius wrote in the Treaties about architecture [1].

There were descriptions of outlet systems of rain water in the chart concerning kavediums. Vitruvius separated constructions and spatial structure on five types (kinds). Those were the Tusksian, the Corinthian, the four-columned, the flowing and the roofed. He explained on different methods of diversion rain water too. In the Tusksian beams were laid across the width of the atrium and should bear the cross beams and timbers under gutters extending from the corners of the walls to the corners of the beams intersection, and had slopes for rainwater along the rafters to the hole in the middle of the roof. (Fig. 1.1) The same system was in the Corinthian, but extension from the walls beams based on the columns located on the inner perimeter of the atrium (Fig. 1.3).

In the four-columns support (columns) were set at the intersections of the beams increasing the strength of the beam and facilitating the construction. In the flowing rafters supporting the roof, throw off rainwater not inside the atrium but outside (Fig. 1.2). "Such coatings of kavedium are easier for winter houses because their raised holes in roofs do not interfere with the lighting in dining rooms. But they cause great inconvenience in terms of repair, because the pipe in which rainwater flows around the walls can't quickly absorb the water drained from the gutters and so filled to the top, pour it over the edge and spoil in such houses carpentry work and own walls" [1]

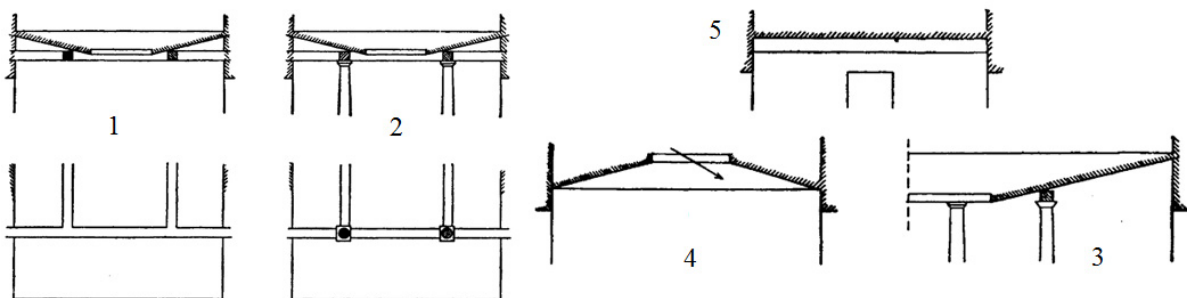


Fig. 1. Drawings and comments by Auguste Choisy [1]. Sitem 1 – The Tusksian 2 – The four-column 3 – The Corinthian in which Choisy assumed two lines of columns 4 – The flowing (displuviatum) 5 – The roofed (testudinatum or tent-roofed by Vitruvius), but it had a wide meaning as it could be seen from a context.

First of all, a big the carry-over of a roof was made for water diversion from building walls. A cornice got the most proliferation with development of architectural construction. It allows not only making the carry-over of roof, but didn't give water drips to fall down on the walls by a combination forms and belts. In Ancient Greece and Rome

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات