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The river front of Benares: between 'sacred' waters and sewage water

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ABSTRACT

The palaces of Benares, built along the river Ganges between the end of the 17th century and the beginning of the 20th century, appear as foremost references of monumental water-front constructions.

This paper explores the role played by these palaces in establishing a relationship between the Ganges and the city of Benares. These constructions integrate the river to the city while simultaneously protecting the city from the river. Were the palaces of Benares with their *ghats* (steps and landings leading to the water) and their foundations constructed to play this double role?

The foundations and *ghats* of these palaces have to be regularly repaired to counter the erosion of the running river water. However, these waters are not the only cause for damage as often drains running along the *ghats* leak and sewage flows over them before discharging into the Ganges. These palaces and their *ghats* will thus be studied in association to both the running 'sacred' waters of the river Ganges (in the forefront) and the sewage water of the city.

KEYWORDS

Water-architecture, river, sewage

INTRODUCTION

The palaces and *ghats* (steps and landings leading to the water) built along the river Ganges have consolidated the banks of the river and have protected the city of Benares from river currents and annual floods. Yet, most of these *ghats* and palaces have, in spite of their grandeur, collapsed and are today in a state of ruin. There are numerous reasons which explain the causes for the damages to these structures, including lack of means to maintain and renovate them. This paper will limit its study to the role of water as a cause for damage; running waters, river water, streams and rivulets, flooded tanks and ponds as well as percolating sewer.

I shall initially present the different palaces and *ghats* in their historical context followed by the techniques used in their constructions. I shall then proceed to place these structures in their geographical context so as to understand their position in relation to the river and to the drainage system of the city.

These structures will be questioned as to how effective they are and if during their construction they take into account the sources of running water which often happens to be the first cause for the crumbling of foundations. We shall discuss how on one hand the structure permits ready access to the river water, considered sacred and purifying for ablution; and on the other hand how the lack of efficient drainage structures pollutes this 'sacred' river.

SHORT HISTORY OF THE RIVER FRONT

The palaces of Benares give to the water front a majestic greatness and beauty. Soaring up five to six floors high, these palaces, constructed in sand stone, red, rose or ochre in colour, seem like fortresses. Actually, the first few floors have very little openings (a single entrance, and few tiny windows) or none at all, and serve only as a base for the more open and inhabited floors. This river front unfolds in an arc form, more than 6 kms in length, compared by Havell in 1905 to 'an amphitheatre, glittering in the sunlight'. These palaces and *ghats* are constructed facing the Ganges and the morning sun. The other bank being free from any construction, they have no vis-à-vis with other buildings but stand erect in front of the seemingly infinite horizon. During the monsoon season, the river overflows and pours partly on this opposite bank.

It is frequent to read that the ancient Kashi (the luminous) is the oldest continuously inhabited city. Historically, its date of origin is uncertain and there are doubts regarding the actual position of the ancient site and its correspondence with today's city. However, the city is mentioned in various ancient texts that confirm its importance as a cultural and religious site since 800 B.C. Till today, this city plays an important role as a religious and philosophical place as well as one of the most important pilgrimage sites in India.

The palaces and *ghats*, that form today the riverfront of Benares, were built in more recent times. Most were built, in the 18th and 19th century, when the city began to be reconstructed. A renewed economic and political stability (after 400 years of muslim rule) led to the construction of eminent residences and religious complexes. Rich personalities came from all over India and beyond, to build temples, palaces and shelters that would welcome pilgrims. It was prestigious for them to have a presence in the city and monumental constructions was a way to reaffirm their power.¹ They brought with them styles particular to their region and adopted techniques prevalent during the Mughal period in India. These numerous palaces, constructed between the rivulet Assi in the south and the river Varuna in the north, reflect the power not of a unique monarch nor of a single culture but of many contributions and individual wishes of minor kings, rich bankers and patrons from all over India².

The city of Benares is closely associated to the Ganges and to the religious character of the river. In the hindu conception, the water of the Ganges is sacred and purifying. The immersion and ablutions in its waters are an everyday practice for the inhabitants as well as for the pilgrims coming from all over India and beyond. The *ghats* constructed at the foot of these palaces enable an easy and clean access to the river. This water architecture, as pointed by Julia Hegewald³, is a common practice all over India along sacred rivers, lakes, tanks and ponds. However, such a long stretch of *ghat* construction is particular to Benares.

These *ghats* also permit an easy access to the city constructed on a ridge of firm « kankar » (concentration of lime) filled clay. This high position is supposed to naturally protect the city from floods and the *ghats* constructed along the banks help to reinforce the banks. Was this *ghat* construction a tradition or a novelty when it was first built? How did this tradition evolve and what are the current means to protect the city from the river?

The river has also for a long time played a crucial role in the economy and the evolution of the city. It had always been an excellent navigable route which explains partially the continuity of

¹ FREITAG, S., *Visualizing cities by modern citizens*, in GAENZLE M., and GENGNAGEL J., *Visualizing space in Benares : Images, Maps and the practice of representation* ; Harrassowitz Verlag, Wiesbaden, 2006 ; pg. 244.

² Idem.

³ HEGEWALD, J., *Water architecture in South Asia : A Study of Types, Development and Meanings*, Leiden, 2002.

the city in history. Part of the *ghats* were used as ports that harboured ships and boats exporting silk, diamonds and jewellerys, muslin and other manufactures of the city.

TECHNIQUES OF CONSTRUCTION

The foundations of these palaces and ghats are rarely visible as they are covered by the river and extend way below ground surface. One has to depend on different sources to have an idea about the forms and the materials used for their execution. As these palaces were built mostly in the 18th and 19th century, this paper focuses on the hydraulic constructions, often linked to bridges and sluices, built in the same period. Their foundations rested on piles of brick masonry, a tradition probably brought to India by the Mughals. Similar foundations must have been used for the construction of the palace foundations in Benares.

Another current way to imagine old foundations are by comparing them to those found in other cities. In Vrindavan, where the water of the river has reduced to a considerable length, *ghat* steps do not descend to the water edge and foundation piles are exposed underneath, enabling one to have an idea about the dimensions and forms of the foundations in Benares.

Medley in 1873 gives a brief description of foundations built along rivers⁴. According to him, wooden piles were rarely used as timber was scarce and was prone to rot. Instead cylinders of brick masonry was used, three to twelve feet in diameter, sunk to firm stratum and safe from river erosions. 'A sufficient number of wells are designed to carry the super-incumbent weight whether it be a house or the pier of a bridge, and the whole series being sunk to the required level, and as close together as possible ; the tops of the wells are arched over, the arches are all connected together by slabs of stones or other arches, and on this artificial platform the superstructure is raised'⁵. However, he does not give us any indication about drains linked to the structure.

Today, many of the new ghats being constructed or the old ones getting repaired use five meters high RCC (reinforced cement concrete) piles placed every two meters. To further protect these piles from the water currents, huge boulders are heaped up in front. On the other side, a mixture of sand, broken stone and cement cover the surface of the bank on which stone steps are arranged.

Stone steps or *Ghat* like structures are common today for the more important ghats (like Assi where stone is used for each step), however less known banks are often reduced to just a sheer expanse of steep retaining walls, now and then broken up into terraces. This kind of intervention is implemented to reduce expenses while at the same time insuring the protection of the *ghats*. Instead of stone, brick (much cheaper in cost and execution) is used on the surface.

A thorough survey on site will be needed to study more closely the structure of these *ghats* and palaces in their context. Primarily, it will be important to calculate how effective the new structures are and compare them to the old ones. Secondly, the permeability of the structure will be questioned in relation to the river and to the drainage and sewerage systems. Finally, one will have to question the structures in relation to the overflow of sewage.

⁴ MEDLEY, J. G., India and Indian engineering, London, 1873.

⁵ Idem. Pg. 15.

DRAINAGE AND SEWERAGE SYSTEM IN RELATION TO THE GEOGRAPHICAL CONTEXT

The city of Benares is built on a high ridge of *kankar* (lime concentration). It is assumed that the nature of this *kankar* renders the bank very stable. Actually, the banks are further stabilised by the construction of *ghats* and palaces.⁶ Based on the map of Prinsep, Dr. R.L.Singh has drawn in his book a figure which illustrates the initial physiographic conditions of Benares. Along the river Ganges a high ridge of *kankar* can be seen, extending almost continuously from one end of the city to the other interrupted only at Dasaswamedh *ghat* by the *Godaulia nala*⁷. This high ridge acts as a solid natural barrier protecting the city from the river.

The palaces and *ghats* of Benares have been constructed on this high ridge of *kankar* further consolidating the banks. They form the extremity of the city and are mainly designed in relation to the river water and are thus very different from the rest of the buildings found in the city. This river front seems to be constructed independent to the city that spreads out behind. In Prinsep's map of 1823, the level of land on the other side of the ridge slopes down slightly and a series of ponds and tanks are found all along the ridge. Initially, these tanks were supposed to collect the drainage and direct it either through the Varuna river or through the *Godaulia nala* into the river Ganges. However, with the densification of the city, most of these ponds and *nalas* have been filled up.

Till what extent were the construction of *ghats* and palaces linked to the infrastructure of the city? Actually, rich personalities were ready to pay large amounts for the development of religious structures in the city : *ghats*, temples, dharamshalas (shelters for pilgrims). To a certain extent, public welfare too was financed by the patrons of the city as an act of piety. However, the city spread in an unplanned way, and there lacked a powerful coordinating body that would effectively work on the management of large infrastructures. A committee did form for a very short period. It functioned from 1826-1829 and began various works for the development of the city. Prinsep, who was its secretary pointed out that « while resident pensioned noblemen and disinherited princes were embellishing the City in massive stone above ground the members of the committee would content to labour in humble brick underground ».⁸

Before the beginning of the 18th century Varanasi had an extensive system of underground drains meant primarily for carrying rain-water. These were large drains unsuitable for the flow of sewage as they were rectangular in shape with irregular gradients. Made of brick and rough stone work (from 1-6 ft wide and from 1-9 ft deep.) they ran at varying levels down the centre of the paved lanes, connected with courtyards of houses. They later played a role in the laying and development of a new sewer at their old site. Actually, the committee that worked for the improvement of the city in 1826 designed one main sewer, carrying the entire sewage of the city. It was built running down the stream and dropping the sewage into the Ganga near Rajghat.⁹

Around 1867 a municipal Board was instituted that introduced improved sewerage and drainage facilities. However, an entire sewerage system was introduced in the city only in 1891 and completed by 1917. This must have been the time when most of the tanks and *nalas* were filled

⁶ According to Singh, « just as the banks would most probably have been protected in the past thanks to the forest that covered this site, so today the stability of the bank is maintained by the construction of *ghats* and palaces », in SINGH R.L., *Banaras : a study in Urban Geography*, Banaras Hindu University, Varanasi, 1955, pg. 15.

⁷ *Nala* : it can signify a big drain, a gutter, a rivulet or a watercourse.

⁸ Swami Medhasananda, *Varanasi at the crossroads : A Panoramic View of early modern Varanasi and the story of its transition*; Ramakrishna Mission, Institute of Culture, Kolkata, 2002. Pg.435

⁹ SINGH R.L., *Banaras : a study in Urban Geography*, Banaras Hindu University, Varanasi, 1955.

up, either for construction of buildings or for establishing new roads (eg. The Godaulia *nalla* filled up to become the Dasaswamedh road).

With time this sewage system installed became inadequate with the quickly expanding city. Furthermore, numerous leaks in the pipeline led to overflow of sewage directly into the Ganges at several places. There are several records of palatial houses collapsing because of these leakages. Already in 1955, Singh mentions that « the reconstruction and improvement of the ghats as also the improvement of the drainage system are interrelated problems and need to be tackled at the same time »¹⁰.

In 1971, to prevent the pollution of the river at the important ghats, a new sewerage system was added. This system, constructed on the bank of the river, intercepted the sewage discharges to the river and was called the Ghat intercepting sewer. This sewage discharge came from a number of old drains between Meer ghat and Trilochan ghat. This interceptor sewer serves the ghat portion of the town and all the sewer that cannot be drained into the main sewer.¹¹

Today, the scene of the ghats are much denatured by the presence of huge cylindrical often light pink coloured structures constructed along the entire river front, which are the pumping stations. These structures are supposed to pump out the sewer which is drained towards the ghats, and take it towards a treatment plant. Six major drains, that pass through densely populated areas of the city before discharging into the river, are tapped and pumped at the 5 pumping stations. The problem is that these pumps work on high electrical means which the city cannot afford to invest on. Therefore, during power cuts, which occur at regular intervals during the day, these pumps cease to function. The sewage then flows directly into the river over the *ghats*. In places where the river is used for domestic or ritual purposes there are some arrangements done to shift this same sewage, through pipes and manholes, a little distant off. But, this does not prevent the pollution of the 'sacred' river by the sewage water.

CONCLUSION

In a city of over 1.2 million habitants, the pollution of the river presents a health hazard specially to those who bath in it and drink its waters. Many organisations have sprung up within the city to try and find a solution to the problems linked to the pollution of the Ganges. There is a contradiction in the fact that 'Ganga water' supposed to purify should have 'a fecal coliform count, in the religious bathing areas of the ghat, 10,000-100,000 times higher than acceptable level'¹². This short presentation tries to associate the lack of adequate sewage facilities to the architecture of the river front. It invites to study documents elaborated by the different bodies responsible for the maintenance of the ghats, the drains, the sewer, and the water pollution of the Ganges and question the existing links between these different bodies.

REFERENCES

- COUTE, P.D., LEGER, J.M., *Bénarès : un voyage d'architecture*, ed. Créaphis, Paris, 1989.
- ECK, D.L., *Banaras : City of light*, New York, Alfred A. Knopf, 1982.

¹⁰ idem, pg. 44.

¹¹ Report : Varanasi city under Ganga Action Plan, Phase 1, Detailed project report, UP Jalnigam, 1986-87.

¹² KIRCHNER, J.W., *Effects of engineered channel modifications on flood stage and bank erosion of the Ganges river near Varanasi* ; US-ASIA environmental partnership, environmental exchange program, Technical Report, 1997.

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FREITAG, S., *Visualizing cities by modern citizens*, in GAENZLE M., and GENGNAGEL J., *Visualizing space in Benares : Images, Maps and the practice of representation* ; Harrassowitz Verlag, Wiesbaden, 2006 ; pg. 244.

HAVELL, E.B., *Benares, the Sacred City*, Londres, Blackie and son lmt. 1905.

HEGEWALD, J., *Water architecture in South Asia : A Study of Types, Development and Meanings*, Leiden, 2002.

KIRCHNER, J.W., *Effects of engineered channel modifications on flood stage and bank erosion of the Ganges river near Varanasi* ; US-ASIA environmental partnership, environmental exchange program, Technical Report, 1997.

MEDLEY, J. G., *India and Indian engineering*, London, 1873.

SHERRING, M.A., *The sacred city of the hindus : An account of Benares in ancient and modern times*, London, Trubner and co. , 1868.

SINGH R.L., *Banaras : a study in Urban Geography*, Banaras Hindu University, Nand Kishore and bros., Varanasi, 1955.

SWAMI MADHASANANDA, *Varanasi at the crossroads : A Panoramic View of early modern Varanasi and the story of its transition*; Ramakrishna Mission, Institute of Culture, Kolkata, 2002.

Report : Varanasi city under Ganga Action Plan, Phase 1, Detailed project report, UP Jalnigam, 1986-87.

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