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The Role of Geology in Urban Site and Development: The Case of Rome and Naples

Geology and terrain factors are basic prerequisites for population growth, urban development, and prosperity. Early human settlements were usually situated in close proximity to abundant natural resources such as water and game and, later on, to fertile lands, building materials and ore deposits. Landscape often played a major role in choosing the location and development of cities, which were originally settled to take advantage of some geomorphological feature for self-defense. More recently, suitable locations for new urbanizations have been selected based on their strategic position regarding communication and trade. Local geology, much more than regional geology, has always affected the way in which urban centers have developed.

Due to the lateral variability of terrain geology, the factors favoring urban settlement are often highly localized. Indeed, if the foundation of a settlement takes place in optimal areas, further urban expansion will often occur in undesirable or even inhospitable areas such as flood plains, unstable slopes, coastal belts, arid areas, or even active volcanoes. The necessity of city expansion often threatens such natural resources as agricultural, recreational, and conservation areas. The construction of tall buildings often does not take into account bedrock and soil characteristics that are crucial for the longevity of the foundations. Finally, the necessity of using underground space for the development of infrastructure exposes city structures to hazard, if geological factors are underestimated or not even considered. The development of advanced technologies creates the conviction that these problems are easily soluble, but it often translates into a rupture of the equilibrium between man and the environment that may in turn initiate a process of decline.

Several recent studies have highlighted the fact that knowledge of the underground geology of big cities is key to identifying and protecting resources, to preventing natural hazards, and to avoiding environmental disasters, but a general understanding of the way in which all the complex geological variables converge in the development of a urban environment is still lacking. The history of ancient cities suggests that when urban agglomerations over-expand, they usually reach dimensions at which a process of decline is prone to start. So, the question is: what is the optimum size of a city? Do “overgrown” cities permit effective administration and are they adequate urban environments in which to live? What can we learn from the experiences of the past?

The history of ancient cities such as Rome and Naples provides important examples of how the expansion of cities has worked in practice. At first, natural resources were managed “in harmony with nature” and guaranteed civilization and security. However, the decline of the Roman Empire and the decline of Naples occurred when the necessity of expansion produced a disconnection with the path of “sustainable development,” giving rise to natural and anthropic hazards. I propose to use this line of thought to summarize and describe the evolution and the decline of these two cities. After that, I will compare the histories of Rome and Naples to that of specific modern urban areas. The ultimate goal is to understand when a growing city reaches such dimensions as compromise its harmony with nature and bring about the process of decline.