

Water-Driven Music

Subjects: Music

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Water-driven music technology has been one of the primary sources of human leisure from prehistoric times up until the present. Water powered, along with air pressure organs, have been used throughout history. One of them was an organ of fountains located inside a formal garden.

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1. Introduction

The relationship between the study of nature and music is present in many ancient civilizations ^[1]. The Grecian Pythagorean philosophers were the first who explicitly investigated musical sounds in mathematical terms ^[2]. Since then, nature and water have been used as inspiration by many composers. Rock paintings dating from prehistoric times located along bodies of water which served as transportation routes, made a natural echo-based sound and in its own right was considered a “musical instrument”.

The instrument hydraulis, the forerunner of the modern organ, was invented by Ktesivius in Classical Alexandria. Such a well preserved model made of pottery was found at Carthage in 1885. The instrument used water to supply a constant flow of pressure to the pipes. The keyboard mechanism had a device by which the instrument was supplied by air. Essentially, the air that flowed into the pipes that produced the sound came from a wind-chest connected by a pipe to a dome; air is pumped to compress water, and the water rises in the dome, compressing the air, and causes a steady supply of air to the pipes ^[3]. Thereafter, several musical instruments based on water have been developed.

The word innovation raises a problem of great importance in the history of water-driven technology. The surface tension of water has high flexibility and a fast response to imposed vibrations, even with transients as short-lived as a few milliseconds. Therefore, water is able to translate many of the sinusoidal periodicities in a given sound technology. Musical fountains are deemed suited for both amusement parks as well as large appropriate outdoor and indoor areas.

2. Water-Driven Music Technologies

Water is a sound source in itself, where even a tiny drop of water can produce a big effect in music. Water is an incredible and engaging system that through rivers, fountains and the sea can inspire musicians to create motion and emotion ^[4]. In addition to being an inspiration for composers, nature and natural formations have served as a “natural water instrument” since ancient times.

The variety of interpretations, combined with respect to water and music, may serve as the ultimate proof of the diversity of human natures, different attitudes, approaches, and interpretations of water as presented by individual musicians and artists. Studying how water is interpreted in music (the imitation of its sound and flow, allusions to the openness of the sea, applying texture reminiscent of water, using rhetoric figures, etc.) helps to realize the multi-faced nature of human relationships with water serving as a catalyst for human creativity.

The composer George Frideric Handel wrote water music for a water pageant on the Thames but included no fanfare for fountains when the piece was first performed on King George I's royal barge in 1717. It is called wave movements, in which ocean wave patterns were translated into musical notation, but that delivery is performed by a conventional orchestra. Though some listeners may know the sound of water from the singing or whistling of showerheads and faucets, hearing the hydraulophone is a far different experience ^[5].

Nature and natural formations such as vertical rocks along water bodies connected with echoes have served as a “natural water instrument” since ancient times. The use of water instruments for musical purposes has been developed through technological progress in contemporary times (1900 AD–present). Zadar's seashore organ, hydraulophones, waterphone, and the world's greatest dancing fountains in Burj Khalifa downtown Dubai are some examples of the use of water

instruments for musical purposes in contemporary times. At first, some instruments had hunting applications. For example, they were used mostly to create spooky atmospheres rather than melodies. Since its haunting tones are reminiscent of whales, some have even used the waterphone to call to marine mammals. However, nowadays, most instruments are used as entertainment. As an instance, unlike the waterphone, hydraulophones can be played melodically like a piano. Other aspects of employing water for musical aims may be observed in some creations such as The Dubai fountains and seashore organ in Zadar.

The musical water fountain is loosely based on the fountain located in front of the famed Bellagio hotel and casino. It takes input from any sound source and the sound breaks it down into different "sequences", then they use the output to turn on various solenoid valves. Each of the different ranges will correspond to a different valve which then comprises the musical water fountain to operate to the beats and rhythms of the song.

References

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