The History of Water Filters – Part III

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The Use of Chlorine to Purify Water

As municipal water treatment facilities sought to increase the quality and healthfulness of public water supplies, more and more cities began to implement chlorine into their water treatment process. Chlorine was first recognized as a valuable chemical in treating water when John Snow used it to purify the cholera-causing water of the Broad Street Pump. Noting the disinfecting nature of chlorine and its ability to curb cholera deaths, government officials in Great Britain began to chlorinate the public drinking water. This application of chlorine resulted in a sharp decline in deaths from typhoid, as well (Christman, 1998).

After the tremendous success of drinking water chlorination in England, chlorination began in New Jersey and soon spread through the entire United States. Chlorination of drinking water, combined with the use of sand water filters resulted in the virtual elimination of such waterborne diseases as cholera, typhoid, and dysentery. In fact, chlorine was so effective at eliminating the outbreak and spread of waterborne diseases that Life magazine named water chlorination as "probably the most significant public health advance of the millennium" (Christman, 1998).

Chlorine has now been a major part of municipal water treatment for nearly 100 years. About 98% of municipal water treatment facilities now use chlorine disinfectant as their disinfectant of choice, and about 200 million U.S. residents receive chlorinated drinking water through their home faucets (Christman, 1998).

Scientists are now beginning to examine the possible byproducts and side effects of using chlorine in drinking water. Chlorine is listed as a known poison; it undoubtedly has an adverse effect on our body systems. Chlorinated water has been linked to the aggravation and cause of respiratory diseases like asthma. Also, because chlorine vaporizes at a much faster rate than water, chlorinated water presents a significant threat to the respiratory system when used for showering. Recent discoveries of the health concerns of chlorine have led many people to install shower filters or whole house water filter systems into their homes. Such installations are the next step in the evolution of water filtration technology.

The Clean Water Act of 1972

As the 20th century progressed, more and more metropolitan areas in the world found it necessary to install water treatment plants in order to provide clean, healthy water to their residents. It became a general principle in the developed world that every person had the right to clean, pure water. There was no universal standard or definition for clean, pure water. Many city officials, as they noted the disinfecting power of chlorine, believed that providing disinfected, yet untreated, water to city residents was their only responsibility.

Environmental concerns rose in the United States in the 1960s and 1970s that would greatly affect the definition of clean, pure water and the responsibility of the government to provide such water. In the early 1970s, environmental lobbyists in the United States began to see results in their fight for the environment. Multiple environmental acts passed through Congress in rapid succession, including the formation of Earth Day as a national holiday, the formation of the Environmental Protection Agency (EPA), the passage of the Clean Air Act, and, most important to the history of water filters, the passage of the Clean Water Act of 1972 (Outwater, 1996).

The Clean Water Act, like the discovery of the microscope and the disastrous effects of cholera and typhoid epidemics throughout the world, sparked renewed interest in water filtration. It became law that every city in the nation install a water treatment plant, and it became a national goal to have clean water, once more, by 1985 (Outwater, 1996).

Because industrial waste was viewed as the main culprit of contaminated water, industrial plants were the main targets of the law. Over the next few decades, the U.S. government expended billions of dollars in grants to industries to create environment-friendly waste management techniques. Cities were also given grant money to install water treatment plants. Eventually, the sludge in the rivers and water supplies of the nation began to disappear.

Water Filtration in the Present - Whole House Water Filter Systems

Despite government regulations and incredible advancements in water technology, the water issuing from home taps is still quite contaminated. Although municipal water treatment plants are intended to provide clean, healthy water to all city residents, such plants must work with heavily contaminated water. The water contains disease-bearing pathogens, pesticide chemicals, and industrial sludge, to name only a few of modern water contaminants.

City officials must provide the healthiest water to municipal residents which modern technology affords. Considering the dirty water with which they have to work, this task can be quite daunting. Disinfection and disease control remain the main goals of such water treatment plants. Consequently, city residents receive chlorinated, and often fluoridated, water. Chlorine has been linked to asthma and other respiratory diseases, and excessive fluoride intake can lead to yellowed teeth, dental problems, and other serious health problems for young children.

City water treatment plants are simply unable to provide pure, chemical-free water to city residents. Even when water is purified at a municipal water treatment plant, it often picks up lead and other chemicals when traveling through a home's plumbing system. While shower filters are a viable solution for the removal of chlorine from showering water, the best, and most modern, available water filtration technology lies in whole house filtration systems. These water filtration systems are installed in individual homes. They filter water as it reaches a home's plumbing system, removing chlorine byproducts, tiny organic materials, and any other unwanted chemicals. They provide the purest form of water available. In fact, water filtered through a whole house water filter has begun to fulfill Hippocrates's vision of great-tasting, clean water.

The Future of Water Filtration

The current major concerns in regard to water quality are lead and disinfection byproducts (Binnie et al, 2002). Lead is a key operational and treatment concern for municipal water treatment plants. It cannot be considered independently of other water quality and treatment issues. In fact, it seems that water disinfection and protection from lead infiltration are at odds with each other. The pH level required for disinfection must be below 8.0, but the pH level required to minimize lead solvency in plumbing systems is often 8.0 or higher. Water treatment plants provide clean, disinfected water to home plumbing systems, but this water is immediately contaminated from lead as it passes through the plumbing system. The solution to this problem may be the removal of lead from plumbing systems, a factor that would completely revolutionize the plumbing industry.

The rising concern over chlorine byproducts is also likely to affect the future of water filtration. It has long been recognized that chlorination of water results in the formation of THMs. THMs are harmful chemicals that form as a reaction between chlorine and natural, organic materials in water. The most well-known of the THMs is the poison chloroform. This poisonous gas, detrimental to the respiratory system when inhaled, is one of the most important reasons for the installation of shower filters or whole house water filters. It is likely that future research will find other byproducts of chlorination, and the use of chlorine for disinfection could be restricted.

Though these are all speculations, water filtration and treatment will, doubtlessly, continue to evolve in the future. The most important future development may well be the complete transformation of water filtration technology from municipal water treatment plants to whole house water filters, or a combination of the two systems.

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