

Have you ever felt sleepy in a hot, stuffy building? Does stale air give you a headache? Air conditioning can solve these problems. But air conditioning runs on electricity. And generating electricity makes greenhouse gases.

The architects designing a university building in London in 2005 were worried about greenhouse gases. So they used natural ventilation to keep the air fresh (and the students awake.)

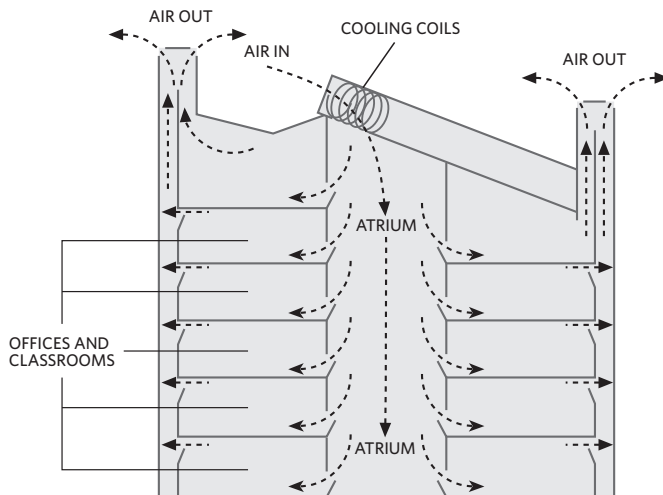
The architects were inspired by Westminster's Central Hall, which was finished in 1912. A huge paddle wheel brought in air through the dome. The air moved down. Then it left the building through big doors and chimneys. So fresh air always filled the building. Nobody knows if the Westminster Hall architects were influenced by - or even knew about - the similar natural ventilation system in Turkey's Suleymaniye Mosque, built 350 years earlier.



Methodist Central Hall, Westminster, London

The 2005 architects designed a natural ventilation system to keep the new university building cool - however hot the weather. They used computer models to help them, and did lots of calculations. The architects made a small-scale model of the building, too.

Air enters at the top of the atrium, where it passes through cooling coils. The cool air moves downwards. It supplies air to each floor of the building. This air warms up as it goes through classrooms and offices. Then the warmer air leaves the building.



Natural ventilation in a new building at University College, London.

The architects wanted the warm air to leave the building through huge chimneys. They asked a scientist to check whether this would work. The scientist made a see-through model of the building in a water tank. He pumped in coloured fresh and salty water to represent warm and cold air. He filmed the movement of the water through the model to track the airflow through the building.

The tests showed up a problem. The natural ventilation system wouldn't work on hot days - the air was cooler inside than outside so it wouldn't go up the chimneys. A building engineer advised the architects to add low-level vents. On hot days, air will exit the building through these vents.

The architects have written about the new building's natural ventilation system in scientific journals and on the Internet. They hope others will be influenced by this 'environmentally-friendly' method of temperature control.