

California dreaming – future developments for thermal comfort

We start with reality by looking at comfort in air conditioned (HVAC) buildings. Several large-scale investigations show they are being overcooled in summer, even to the comfort and health detriment of the occupants. The reasons for overcooling are not known, but some of it may be a byproduct of the way dehumidification is handled in HVAC systems. Is the amount of dehumidification required? Three tropical case studies comparing dehumidified HVAC buildings against naturally ventilated (NV) buildings (that are not dehumidified) find equal comfort acceptability in each, even though the temperatures and humidity levels of the NV buildings are significantly higher. The variable that makes warm-and-humid NV environments as acceptable as cold-and-dry HVAC environments is air movement. Since air movement can provide comfort in high temperatures and humidities, and also has the benefit of being fast-acting, should we be using it more creatively in both types of buildings to reduce the energy they require? The dream focuses on very low-energy means of moving air around people to cool them. Efficient ways of warming people are also described.