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Why Cities Stay Hot at Night

Anyone who has walked home across a city in August knows the feeling. The sun has been down for two hours, the air should be cooling, and yet the pavement still breathes heat up through your shoes. The same evening, twenty minutes out of town, people are reaching for sweaters. This difference has a name, the urban heat island, and it is one of the few climate problems a city can do something about on its own.

The cause is not mysterious. A field or a patch of woodland takes sunlight and spends most of it on evaporation: water moves out of leaves and soil, and that process carries energy away. Concrete, asphalt and dark roofing do not evaporate anything. They absorb the sun all day, store it, and give it back slowly after dark. Add the waste heat from engines, air conditioners and kitchens, and take away the breeze that tall buildings block, and the center of a large city can run several degrees warmer than its surroundings. The gap is widest at night, which is exactly when bodies are supposed to recover.

That last point matters more than the daytime number. People can get through a hot afternoon if the night gives them relief. When it does not, the heat accumulates in the body the way it accumulates in the brick. Hospital admissions for heart and kidney problems climb during long warm spells, and the people most affected are the ones with the least choice about where they live: older residents on upper floors, families in apartments without cooling, workers who are outside all day. In many desert cities the summer nights have warmed faster than the days over the past few decades, and that trend lands hardest on the same neighborhoods every year.

The heat is also unevenly distributed inside a single city. Map the surface temperature of a metropolitan area and the hottest zones line up, almost block by block, with the districts that have the fewest trees and the most parking. Those are rarely the wealthy districts. The pattern is old. Decisions about where to put highways, warehouses and public housing were made decades ago, and the shade followed the money. A thermometer is a blunt way to read a city's history, but it reads it accurately.

The good news is that the fixes are mostly ordinary. Light colored roofs bounce sunlight back before it turns into heat, and they are among the cheapest changes a building owner can make. Street trees cool the air under them by several degrees and make a sidewalk usable at noon. Lighter paving mixes exist, though they work best in places where the glare will not bother drivers or pedestrians. Small parks, green roofs and even unsealed ground between buildings bring back some of the evaporation that the city paved over. None of these is dramatic. Together they are the difference between a night a body can recover in and a night it cannot.

What makes the problem interesting as a policy question is that it does not require anyone to wait for a global agreement. A national government cannot plant a tree on a specific street; a city council can. A building code that asks for reflective roofing on new warehouses costs almost nothing and pays back every summer for forty years. A tree planting program aimed at the hottest ten percent of blocks, rather than spread evenly across the map, does more good per dollar than almost anything else a city can buy.

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There is a temptation to treat the heat island as a minor inconvenience, a few degrees that people will tolerate. That misreads who is paying. The office worker in an air conditioned tower barely notices. The person sleeping with the windows open above a bus depot notices all night. If the point of a city is to make life easier for the people who live in it, the temperature of its nights is a fair test, and one that most cities have not yet passed.

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