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Urban Climatology and Urban Design, a History of (non) Applied Science

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The modern city is unquestionably a producer of weather. Its buildings emit heat, its streets channel wind and modify solar access, and its entire configuration creates a distinct, bounded island of climate difference. Urban design in the large sense has pervasive effects on the microclimate and can produce variations in values of heat, humidity, wind and rainfall that exceed the worst-case predictions associated with global warming. Yet while scientists and policy makers acknowledge the city's role in contributing to the global carbon metabolism, awareness of its internal climate processes remains limited.

Our paper tells the story of urban weather research. We revisit the developments leading to the modern construction of weather as a synoptic phenomenon and juxtapose them with the less familiar histories of environmental measurement and analysis on urban rooftops, within street canyons, under park trees. We highlight the early dominance of German science, as well as North American post-war leadership. The paper shows how the World Meteorological Organization (WMO) helped to establish urban climatology as a research niche within meteorology and physical geography, and charts the specialism's uneven distribution within the global scientific community.

Secondly, the paper studies the ambition of urban climatology to influence urban design practice. We consider various historical attempts to connect the WMO with the architecture and planning sector, and the work of individuals who made the connection such as the Olgyay brothers and Helmut Landsberg. We contrast the successful implantation of climatological expertise in the planning of certain cities (e.g. Stuttgart) with its general disregard elsewhere.

The paper considers twentieth century planning history as a narrative of failure in applied science. Twenty-first century city planning seems likely to take climatology more seriously.

KEY WORDS: Climatology, urban design, micro-climate.