参考译文：

城市气候

The city is an extraordinary processor of mass and energy and has its own metabolism. A daily input of water, food, and energy of various kinds is matched by an output of sewage, solid waste, air pollutants, energy, and materials that have been transformed in some way. The quantities involved are enormous. Many aspects of this energy use affect the atmosphere of a city, particularly in the production of heat.

城市是一个有着自己新陈代谢的巨大的物质和能源处理厂。每天输入水，食物和各种各样的能量，相应的输出废水，废气，固体垃圾，废能和一些已经变形的材料。这个过程中的物质转移量异常的大，这种能源的消耗在很多方面影响城市的气候，特别是热量的产生。

In winter the heat produced by a city can equal or surpass the amount of heat available from the Sun. All the heat that warms a building eventually transfers to the surrounding air, a process that is quickest where houses are poorly insulated. But an automobile produces enough heat to warm an average house in winter, and if a house were perfectly insulated, one adult could also produce more than enough heat to warm it. Therefore, even without any industrial production of heat, an urban area tends to be warmer than the countryside that surrounds it.

冬天城市所产生的热量可以达到或超过其从太阳那里接收的热量。所有用来供暖的热量最后都扩散至周围的环境中，这个过程在那些隔离效果差的房屋里进行得更快。一辆汽车所产生的热量足以为一个普通的房屋供暖，如果房屋隔热效果做得好，一个成年人产生的热量就足以让其保暖了。因此，即使没有任何工业产热，城市地区也会比它周围的地区更暖和。

The burning of fuel, such as by cars, is not the only source of this increased heat. Two other factors contribute to the higher overall temperature in cities. The first is the heat capacity of the materials that constitute the city, which is typically dominated by concrete and asphalt. During the day, heat from the Sun can be conducted into these materials and stored—to be released at night. But in the countryside materials have a significantly lower heat capacity because a vegetative blanket prevents heat from easily flowing into and out of the ground. The second factor is that radiant heat coming into the city from the Sun is trapped in two ways: (1) by a continuing series of reflection among the numerous vertical surfaces that buildings present and (2) by the dust dome, the cloudlike layer of polluted air that most cities produce. Shortwave radiation from the Sun passes through the pollution dome more easily than outgoing longwave radiation does; the latter is absorbed by the gaseous pollutants of the dome and reradiated back to the urban surface.

燃料的燃烧，比如汽车燃料，并不是这种热量增加的唯一来源。城市较高的平均温度。第一个原因是组成城市的主要典型物质是沥青和混凝土。在白天，来自太阳的热量传入到这些物质当中并在晚上被释放出来。但是在乡村储存能量的物质热容更低，因为植被会防止这些热量在地面上流动过快。第二个因素是太阳辐射进城市的热能有两种传递方式（1）通过大量建筑的垂直表面的一系列折射来传递（2）通过由大多数城市中受污染空气组成的云状物质来传递。来自太阳的短波辐射比长波辐射要更容易穿过污染层，后者被这层物质中的气体污染物所吸收，然后重新辐射到城市的表层。

Cities, then, are warmer than the surrounding rural areas, and together they produce a phenomenon known as the urban heat island. Heat islands develop best under particular conditions associated with light winds, but they can form almost any time. The precise configuration of a heat island depends on several factors. For example, the wind can make a heat island stretch in the direction it blows. When a heat island is well developed, variations can be extreme; in winter, busy streets in cities can be 1.7℃ warmer than the side streets. Areas near traffic lights can be similarly warmer than the areas between them because of the effect of cars standing in traffic instead of moving. The maximum differences in temperature between neighboring urban and rural environments is called the heat-island intensity for that region. In general, the larger the city, the greater its heat-island intensity. The actual level of intensity depends on such factors as the physical layout, population density, and productive activities of a metropolis.

城市要比它周围的乡村地区要热，同时它们也创造了被称为热岛效应的现象。热岛效应在有微风的情况下最明显，这种微风随时都可以出现。热岛的准确状态决定于好几个因素。比如风能在它出现的地方形成一个区域性的热岛。当一个热岛形成一定规模时，温度变化可能会非常极端，在冬天，繁忙的街道可能要比普通的街道热 1.7℃。那些红绿灯附近的地区同样要比红绿灯之间的地区要暖和，因为汽车停止时候的热效应要比运动时要明显。城市周边和乡村温度的最大不同是地区热岛效应的程度。一般来讲城市越大，热岛效应的程度就越强。实际上热岛效应的程度取决于几个因素比如物理输出，人口密度，城市的产能。

The surface-atmosphere relationships inside metropolitan areas produce a number of climatic peculiarities. For one thing, the presence or absence of moisture is affected by the special qualities of the urban surface. With much of the built-up landscape impenetrable by water, even gentle rain runs off almost immediately from rooftops, streets, and parking lots. Thus, city surfaces, as well as the air above them, tend to be drier between episodes of rain; with little water available for the cooling process of evaporation, relative humidities are usually lower. Wind movements are also modified in cities because buildings increase the friction on air flowing around them. This friction tends to slow the speed of winds, making them far less efficient at dispersing pollutants. On the other hand, air turbulence increases because of the effect of skyscrapers on airflow. Rainfall is also increased in cities. The cause appears to be in part greater turbulence in the urban atmosphere as hot air rises from the built-up surface.

在大都市里表面大气之间的关系产生了一系列特殊的气候特征。首先，湿气的存在与否受到了城市表层特殊性质的影响。由于水无法穿过这些城市建筑，即使是很小的雨也会立即从屋顶、街道和停车场流到地下。这样城市表层包括其空气在雨季的间歇期就会比较干燥，由于缺少水的蒸发过程来降温，相对湿度通常也很低。气流会因为城市建筑的摩擦而改变，这种摩擦会降低风速，使得气体扩散污染物的效率降低。另一方面，湍流也会因为高层建筑的影响而增加。雨也会减少。城市气候中从地表上升的热气流应该是这种更大湍流的诱因。