

Delight

People have a sense of warmth and coolness, a thermal sense like sight or smell, although it is not normally counted in the traditional list of our five senses. It is usually included with other aspects of the sense of touch. They are taken as one, probably because the thermal sense is located in our skin where our senses of touch and pressure also lie, or perhaps because we notice the temperature of something most accurately when we touch it directly, that is, when we conduct heat to or from it. But the thermal sense is definitely a separate sense, for we have specialized nerve endings whose only function is to tell us if some part of our body is getting cooler or warmer.

As with all our other senses, there seems to be a simple pleasure that comes with just using it, letting it provide us with bits of information about the world around, using it to explore and learn, or just to notice. The stone is cool; yes, it feels cool when I touch it; perhaps it has been in the shade for a while. The coffee cup is warm; it warms my hands. There is something very affirming of one's own life in being aware of these little pieces of information about the world outside us. When the sun is warm on my face and the breeze is cool, I know it is good to be alive.

There is a basic difference, however, between our thermal sense and all of our other senses. When our thermal sensors tell us an object is cold, that object is already making us colder. If, on the other hand, I look at a red object it won't make me grow redder, nor will touching a bumpy object make me bumpy. Thermal information is never neutral; it always reflects what is directly happening to the body. This is because the thermal nerve endings are heat-flow sensors, not temperature sensors. They can't tell directly what the temperature of something is; rather, they monitor how quickly our bodies are losing or gaining heat. From this information we judge how much colder or warmer than body temperature an object is. For example, if I touch a piece of wood and a piece of metal that are both at room temperature, the metal will feel colder because it absorbs the heat from my hand more quickly.

As long as the temperature differential isn't very great, our bodies can use one of their metabolic strategies to adapt to the new conditions and the thermal stimulus will not longer be noticeable. Thus, when I walk into a warm room, I notice at once how warm the air is. Within a few minutes, however, I have adjusted and the room feels normal. Or rather, I feel normal in the room. We might draw a parallel with the fatigue experienced by the other senses (although the mechanism is not the same). We can only smell a rose for so long before the smell fades away. The sensors become saturated and attention moves on to new information. Our nervous system is much more attuned to noticing change in the environment than to noticing steady states.

A proper gourmet meal has a wide variety of tastes—salty, sweet, spicy, savory—so that the taste buds can be renewed and experience each flavor afresh. This renewal mechanism seems to be especially active for the thermal sense when we experience a temperature change within the basic comfort zone. There is an extra delight in the delicious comfort of a balmy spring day as I walk beneath a row of trees and sense the alternating warmth and coolness of sun and shade.

We all love having our world full of colors, every color in the rainbow and then some. Even though studies have shown blue to be the most restful color, I doubt that anyone would put forth an argument for a monochromatic world. And yet a steady-state thermal environment is the prevailing standard for office buildings, schools, and homes across the United States. James Marston Fitch nicely sums up this ideal: “The technology of heating and cooling aims . . . to achieve a thermal ‘steady-state’ across time and a thermal equilibrium across space.” In other words a constant temperature everywhere, at all times. He goes on to note that “Neither of these criteria is easy to achieve since radiant and ambient are very unstable forms of energy.”¹ Such uniformity is extremely unnatural and therefore requires a great deal of effort, and energy, to maintain. Engineers must use extremely sophisticated methods to ensure that every location within an enormous office tower can be maintained at a constant temperature and humidity.

It is not at all uncommon these days in Houston or Los Angeles to drive an air-conditioned car to an air-conditioned office to work until it is time to go to dinner in an air-conditioned restaurant before seeing a movie in an air-conditioned theater. Of course there is the brief inconvenience of a blast of hot air between the car and the office. To remedy this, it is occasionally proposed that a large bubble be put over the city, perhaps a pneumatic structure or one of Buckminster Fuller’s domes. This climatic envelope would enable the entire city to be air-conditioned, indoors and outdoors. Indeed, “outdoors” would be a thing of the past. This approach is being considered on a relatively small scale in the plans for a new General Services Administration building in Colorado. A landscape of low rise structures will be contained within a transparent pneumatic bubble. The buildings will need no windows or doors or individual heating plants because the entire landscape will be maintained at the same comfortable temperature.

The steady-state approach to the thermal environment assumes that any degree of thermal stress is undesirable. A constant temperature is maintained in order to save people from the effort and the distraction of adjusting to different conditions. And yet, in spite of the extra physiological effort required to adjust to thermal stimuli, people definitely seem to enjoy a range of temperatures. Indeed, they frequently seek out an extreme thermal environment for recreation or vacations. This must explain in large part the love of the Finns for their saunas and the Japanese for their scalding hot baths. Americans flock to beaches in the summer to bake in the sun and travel great distances in the winter to ski on frosty mountain tops. People relish the very hotness or coldness of these places.

We should note that of these places of thermal extremes have their opposites close at hand. The Finns make a practice of jumping from the sauna into a snow bank or a cold lake. At the beach, after baking in the hot sun, there is the cold ocean to swim in. The skier freezes on the slope, knowing all the while that the lodge waits down below with a roaring fire and some warming libation. There are probably two reasons for having the extremes right next to each other. The first is physiological: the availability of extremes ensures that we can move from one to the other to maintain a thermal balance. This gives us the safety to enjoy fully both extremes. We can be greatly overheated for a while and then chilled to the bone, all without threatening our health. Indeed, proponents of the sauna claim it even strengthens one's health and improves resistance to cold. H.J. Viherjuuri, a historian of the sauna, quotes an entertaining description by an Italian traveler of the eighteenth century who entered some Finns after their sauna:

In winter they often go out completely naked and roll themselves in the snow, while the temperature is 40 or 50 degrees below zero. They wander naked in the open air, talking to each other and even with a chance passerby. If a traveler in search of help happens to arrive in a remote village at the time when all the inhabitants are in the sauna, they will leave the bathhouse in order to harness or unharness a horse, to fetch hay, or to do anything else without ever thinking of putting any clothes on. Meanwhile the traveler, although enveloped in a fur coat, is stiff with cold, and does not dare to take off his gloves. What astonishes the people of our climate most is that no ill effects ensue from this sudden change of temperature. People who live in warmer climates, on the other hand . . . are liable to get rheumatism even when the most gentle wind blows.²

The second reason to have thermal extremes close together might be termed aesthetic. The experience of each extreme is made more acute by contrast to the other. We need not even directly experience both extremes in order to savor their contrast. Simply being reminded of the cold winter storm outside can make us enjoy the warmth of the fireside more intensely, as John Greenleaf Whittier so vividly recounts in his poem "Snowbound":

Shut in from all the world without,
We sat the clean-winged hearth about.
Content to let the north-wind roar
In baffled rage at pane and door,
While the red logs before us beat
The frost-line back with tropic heat;

And ever, when a louder blast
Shook beam and rafter as it passed.
The merrier up its roaring draught
The great throat of the chimney laughed.

Perhaps the desire for contrast is a reason why the gardens of Islam had to be contained by high walls. The garden, with its flowers, shade trees, and fountains provided a cool refuge from the desert heat. The bright sun and hot desert air could not be completely excluded, but the walls sharply defined the limits of the garden and concentrated the sense of its lush coolness. Certainly, the high walls were a way to ensure privacy, so important for the Muslim. But the walls' highly visible presence also served to emphasize the difference between the cool garden within and the hot desert without.

Since our thermal sensors are not distance receptors, that is, they cannot warn us that a place will be cold before it starts to chill our body, we have to rely on other senses to give us advance clues. We look for qualities that have been associated with warmth or coolness in our past experience. Does the place have soft fuzzy surfaces? Perhaps it will be warm like my wool sweater is. Are the colors reds and browns? Then maybe it will be warm like a room lit by the red-gold light of a fire. Are there mellow aromas? Then surely it will be warm like a kitchen full of people and spires and bread baking.

Such clues from other senses can become so strongly associated with a sense of coolness or warmth that they can occasionally substitute for the thermal experience itself. For example, the taste of mint in drink or food seems refreshing and cool regardless of what temperature it is. Similarly, in order to feel warm and cozy at night, many people find that they must have a heavy set of blankets to cover them while they sleep, even though one light fluffy quilt would be a better insulator. The pressure of the blankets conveys a feeling of warmth quite independent of their actual thermal qualities. An example related by Tetsuro Yoshida suggests that the Japanese are masters of the substitution of one sense for another. He reports": "In the summer the householder likes to hang a picture of a waterfall, a mountain stream, or similar view in the Tokonoma and enjoy in its contemplation a feeling of coolness."³

One of the magical things about our senses is that they do not function in isolation. Each sense contributes to the fuller comprehension of other sensory information. Indeed, one may not even be able to understand the information from one sense properly until it can be related to information from other senses. For instance, a person blind from birth because of a congenital cataract, who then has sight restored by surgery, must learn to see. At first the field of vision consists of light patterns, flat and meaningless. Gradually specific light patterns are associated with the understanding of the world that was previously developed from the other senses. In order to learn

to see three dimensionally, one must touch, rotate, walk around things. By associating sight with bodily movement and touch, the brain begins to perceive form and depth and perspective.

Looking at a photograph of a place, we are limited to purely visual clues about its thermal qualities, yet we still can perceive it to be a warm or a cool place, thermally pleasant or unpleasant. A picture of a mosque in Isfahan, for example, with its polished marble floors and heavy masonry walls, its high airy vaults and deeply shaded recesses, looks invitingly cool and refreshing. Of course, we imagine it to be in the hot desert sun of Iran. With almost the same set of visual clues— heavy masonry, smooth polished surfaces, high airy colonnades—a building in Germany, such as one of the neoclassical government buildings of the twenties and thirties, comes across as forbiddingly cold and hospitable. Our visual perceptions might mislead us completely. Both places could conceivably be heated by a hidden radiant system. With our current technology the temperature of a place need not be associated with the form of the building or the materials used or the region where it is located. But how unsatisfying is this dissociation of warmth or coolness from all of our senses!

To enjoy being warmed or cooled we need some awareness of the process. Clearly, it is impossible to enjoy consciously what we don't notice; yet, most of the processes of heat flow take place below our level of conscious sensation. Most of the mechanisms of cooling, for example, are especially subtle. Heat usually convects away from our skin surfaces in air currents too gentle to discern. Similarly most perspiration evaporates before we perceive our skin to be moist. Clues from other senses can help make us more aware of thermal processes, enabling us to derive more enjoyment from them. For instance, there are many ways to notice that the air is moving and helping to cool us even when it is too gentle to feel. Ho Hsun, a Chinese poet, expressed it well:

You can't see it or hear it,
It is so soft. But it is strong enough
To dust the mirror with pollen,
And thrum the strings of the lute.⁴

Yoshida reports that in the hot and humid Japanese summer "People like to hang a lantern or a wind chime under the roof of the veranda. The lightly swaying lantern or the ringing of the bell gives a suggestion of refreshing wind and coolness."⁵ In Persian gardens roses and jasmine and other fragrant flowers were planted in different quarters so that when the breeze came, it came "loaded with scents."

Many of the other sensory associations with cooling seem to want to remind us of something, like the breeze, lightly playing over a surface. Cooling sounds are light and high pitched, like the Japanese wind chimes or the splashing of water droplets in a fountain. Cool decorations move

lightly over a surface, like the lattice work and laciness of a Victorian gazebo or the mosaics of vines and script that twine endlessly over every surface of a Persian mosque. Indeed, it is right at the skin's surface that people most consciously notice cooling. This makes perfect sense when we consider that both the processes of evaporation and convection take place at the surface of the skin. Even when losing body heat by radiation to a cold surface, people still assume that they are being chilled by a cold draft somewhere in the room. People also feel chilled, to the point of getting goose bumps, if their skin is lightly touched, as with the brush of a feather, even though there is no temperature change at all.

In contrast, there is something basically internal about warmth, probably because we associate it with the warmth generated within our own bodies. Warmth is what's alive at the very core of things. A fire and the sun also generate heat inside of themselves. We feel their heat not so much warming our skin as penetrating into the very center of our being.

Other than a fire or the sun, we are generally the warmest things in our environment, our own source of heat. Thus, when it is cold out, the best way to get warm is to insulate our bodies: to be surrounded by thick, fluffy clothing; to sink into a deep, overstuffed chair; to huddle inside of a small, close-sheltering building. These are all just big enough to enclose our bodies, preventing heat from dispersing very far. Bodies of other people, and animals, can also be sources of heat. To be close to someone is to share in their warmth, both physically and emotionally. Places that remind us of the presence of people, of the life and activities that they generate, capture some of this sense of warmth. The Victorian parlor, with all of its clutter, its remnants of people's lives, its deep upholstered chairs and layers of rugs and curtains and hangings and pictures, has this sense of warmth. The sounds and smells of people all indicate their presence and, thus, their warmth. Things that were once alive and warm themselves, like the fur of a polar bear rug, or the leather of a chair, perhaps even the sheep's wool in a sweater, may carry an association with the previous life and so seem even warmer.

When we get cold, our muscles tense up, trying to generate more heat, and capillaries at the skin's surface constrict. These physiological responses leave us feeling tense and numb. Places that seem warm offer an antidote to the tension and numbness with things that are comforting and soothing: a soft, flowing light; the deep plush of a velvet chair; or the low, resonant notes of a blues song. They help to relax us in the same way that the warmth of a fire, or even a drink of liquor, penetrates through the body and relaxes the muscles.

When we are overheated we often need the opposite antidote. The heat makes us lethargic and slow-witted. Any action requires too much effort. There is delight, then, to be had in things that provide a little liveliness for us, like the splashing of a fountain or the sparkle and flutter of Japanese street decorations. Their activity helps the mind feel a bit more quick-witted and lively in spite of the fullness of a hot, muggy day. A hot day, however, can also be stressful because it over

stimulates. The sun can be too bright, glinting off of every surface, accompanied by an inescapable dry wind that exhausts the nerves. The antidote then is not something that moves and sparkles but a deep, quiet coolness, a place to retreat from the sun and rest in peace. Deeply shaded Islamic prayer halls, with their seemingly endless repetition of columns and arches, produce this clamoring effect. The classical Persian garden is intended to provide the antidote to both the lethargy and the exhaustion of the senses. There is the liveliness of the fountains and the overhanging vines with their fluttering leaves that create a dappled light. And there are also areas of still water and large stone pavilions that create a deep, quiet shade. One is free to move among these different elements and to choose the place where the balance of liveliness and quietude are just right. The Persian garden offers an amazing richness and variety of sensory experiences which all serve to reinforce the pervasive senses of coolness.

Each sense not only gives us different information about the world but also has its own quality, its own evocations. Yi-Fu Tuan has made some interesting correlations between the senses and one's perception of the world. The sense of smell seems to be somehow linked with our faculties of memory. Tuan writes that "Odor has the power to evoke vivid, emotionally-charged memories of past events and scenes. A whiff of sage may call to mind an entire complex of sensations: the image of great rolling plains covered with grass and specked with clumps of sagebrush, the brightness of the sun, the heat, the bumpiness of the road."⁶ Or the same smell of sage, often used in turkey stuffing, might call forth all of the warmth and intimacy of Thanksgiving. Sight is perhaps more difficult to categorize because it functions on so many complex levels. But clearly, it is most important to our spatial understanding of the world. It allows us to see three dimensionally, to judge distance, and thus to understand the relationship of one thing to another. In English, "I see" means "I understand." But vision is also rather static. Although we see motion, we tend to remember visually only a fixed image. Hearing, on the other hand, seems to be strongly associated with a sense of time. A song or a melody to be remembered must be remembered in time. Tuan writes, "With deafness, life seems frozen and time lacks progression."⁷ The sense of touch has an immediacy to it. If we can touch something, we are persuaded that it is not an illusion or a hallucination but that it is very real—right here and now—like pinching yourself to see if you are dreaming. The thermal sense cannot be easily isolated from overall experience, unlike seeing or hearing. We cannot close it off, like closing our eyes. Nor does it provide highly differentiated information, as does the individuality of a person's voice, or even smell. The thermal sense is, however, intricately bound up with the experience of our bodies. We continually sense the heat flow of our bodies, information that creates a general background for all other experience.

Since each sense contributes a lightly different perception of the world, the more senses involved in a particular experience, the fuller, the rounder, the experience becomes. If sight allows

for a three-dimensional world, then each other sense contributes at least one, if not more, additional dimensions. The most vivid, most powerful experiences are those involving all of the senses at once.

Perhaps the human fascination with fire stems from the totality of its sensory simulation. The fire gives a flickering and glowing light, ever moving, ever changing. It crackles and hisses and fills the room with the smells of smoke and wood and perhaps even food. It penetrates us with its warmth. Every sense is stimulated and all of their associated modes of perception, such as memory and an awareness of time, are also brought into play, focused on the one experience of the fire. Together they create such an intense feeling of reality, of the "here and nowness" of the moment, that the fire becomes completely captivating. We are likely to feel that we could spend hours mesmerized by it. Indeed, Gaston Bachelard makes an eloquent case that "Reverie before a burning fire is . . . the first and the most truly human use of fire."⁸

Islamic gardens also offer delights for each sense; they seem to have a power similar to that of fire to captivate the imagination. A Turkish garden motto states clearly the provisions for the senses:

Roses for perfume,
Nightingales for song,
And the sight and sound
of running water.

A sixteenth-century traveler furnished an eyewitness description of the delights of a Persian garden during its golden age:

The garden I shall describe was constructed in such a way that two courses of crystal-clear water met before a building, forming a large lake in which countless swans, geese and ducks disported themselves. Below this lake were seven waterfalls—as many as there are planets. . . From the lake jets of water spouted up so high into the air that the spray, as it descended, was like a rain of diamonds. How often was I moved by the rippling of the fountains and the murmuring of the brook as it streamed downhill, over the terraces of the garden, hemmed in by rose bushes, willows, and acacias. I cried with sheer joy until the exceeding beauty and the rushing of the water rocked me to sleep.⁹

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