

#RESEARCH

It's About The Sense of Touch

The brain receives signals related to touch, temperature, and pain, that's tactile information.



New research sheds light on how the brain combines external information and internal memory to build a sense of touch. When you touch something, whether stepping onto sandy beach or stroking the back of a dog, sensations fly into your brain. You feel the coarse grain of the sand under your feet, the fluffiness of the fur on your hand.

His findings bring that detail and colour: "It's another level of understanding for how everything fits together," says Chen. "The biggest thing is that we've married the catologue with the functional definition, that's really going to open up a lot of ways for us to understand the brain."

Here, Chen explains his findings and their potential for improving our knowledge and care of the brain.

Q. What do your findings reveal?

A. When you're perceiving the world around you, your brain does a combination of processing of the stimuli that makes up the scene, and it also tries to fill information based on what you've learned in the past to help you interpret what you're sensing. Our findings essentially uncover that there is a dedicated circuit composed of specific cells in the catalogue that we call *hub cells*. These cells help to alert the brain that there may be across a salient feature that needs to be investigated further.

Q. Did anything about those *hub cells* surprise you?

A. The *hub cells*, which we identified to be important for feature detection, also respond in interesting ways when your environment changes. There are a certain set of genes that are known to be important for learning and adaptability and that can go up or down depending on changing environments. We found that those genes are always on in *hub cells*, which goes against some current principles. When environments change, these cells respond by trying to compensate for these changes.

Q. What's the significance of your findings?

A. Our findings have relevance for a range of neurological disorders, such as stroke, and neuropsychiatric diseases that can alter sensory perception, from strokes to autism spectrum disorder. Improved knowledge of the brain's circuits, says Chen, an assistant professor of biology, may pave the way for more targeted treatments and interventions.

As part of their dive into the brain's workings, the researchers developed a new method for surveying and watching cells: a platform that generates activity in the brain, shows the molecular composition of the firing cells, and helps compute all of the data. It allowed Chen to look at how different neurons in the cortex reacted and communicated when an animal touched an object, and how those neurons adapted when something in the environment shifted. Chen and his team used the Allen Institute's atlas of the mouse brain, a catalogue of the different types of brain cells, as a starting point for the project. Chen says that the atlas is great for pinpointing the location and category of a neuron, but it doesn't really tell researchers much about the neuron's functions.



Takhta-i yakh, Parcha-i yakh, Shaffaf, Sard, Khunuk kardan

PART:1

The Persian terms used for coldness and cooling convey the different associations of these thermal states. The word *sard*, which is the basic Persian word for 'cold,' refers to a temperature or a state of being, such as a cold climate, but similarly to English, *sard* also carries emotional associations of a lack or loss of heat, passion, or even life. To become cold (*sard shudan*) also means to die, to become extinguished. A cold heart (*dil sard*) is one that is discouraged, whose spirits have been dampened. The word *khunuk* (cool) is a more moderate form of coldness, and can be used to express a welcome relief in temperature. For instance, *hawa-i khunuk* is fresh or temperate air. Although in contemporary uses, *khunuk* can mean boring or uninteresting, in the late nineteenth century, it was recorded that *khunuk* carried associations of cooling, comfort, but also happiness and good fortune. The verb *khunuk kardan* suggested both 'to render happy' and 'to cool.' Both *sard* and *khunuk* appear in period documents, often as near synonyms; for instance, within one paragraph in the Mughal *Ain-i Akbari*, the adjective *sard* is used to describe cold water, but when describing the cooling mats made of *khas*, the adjective *khunuk* conveys something 'cooling' and refreshing.

● Sylvia Houghteling

In his dictionary of Persian words, written in Delhi around 1745, the writer and lexicographer Anand Ram Mukhlis pauses on the entry for *takhta-i yakh*, a word that means a 'sheet of ice' (with *takhta* often referring to a flat plane, board, or surface and *yakh* meaning ice).

Mukhlis notes that this ice is also called *parcha-i yakh*, which translates literally to 'cloth of ice,' although *parcha* can also mean a 'piece' or 'length.' He continues describing this ice as wide (*ariz*), long (*tawil*), and then uses a word, *shaffaf*, that can mean 'transparent,' in the context of a garment, and 'clear' or 'lustrous.' This ice, he writes, is 'like the front of a mirror.' In this entry for *takhta-i yakh*, Mukhlis evokes the texture and radiance of the material, likening it to a wide sheet of ice to a diaphanous, gleaming cloth, and to the smoothness of a mirror. Mukhlis's dictionary captures not just the meanings of words circulating in the Persian-speaking milieu of South Asia, but whole cultural worlds surrounding these terms.

The description of the ice is followed by a poetic couplet from Mir Yahya Kashi, a seventeenth-century poet at the Mughal court, that describes how a frown on the lover's face is so powerful that it melts a mirror as though it were a thin sheet of ice (*takhta-i yakh*). Then, he adds an associative anecdote (*naql*). Mukhlis recalls that when the Mughal Emperor Bahadur Shah (r. 1707-12) was in

Lahore and went hunting in the early morning, he would find frozen water, and 'his eyes sometimes would catch the cracks in sheets of ice. On this, he used to wait and learn a moral.' The diaphanous layer of frozen water at dawn had cracks that could teach even an emperor a lesson. On a broader level, the existence of this ice with the thinness of cloth and its shining mirror-like surface suggests that when encountering coldness and ice in eighteenth-century South Asia, Mukhlis and his contemporaries found in frozen water and frigid air an array of sensory metaphors and poetic associations, that went beyond the coldness of the surface of ice.

More broadly, I propose in this essay that relief from the summer heat in eighteenth-century South Asia was derived from materials and technologies that cooled not only through changes in temperature, but also through their imagery, their scent, their color, and their feel. To become cold (*sard shudan*) also means to die, to become extinguished. A cold heart (*dil sard*) is one that is discouraged, whose spirits have been dampened. The word *khunuk* (cool) is a more moderate form of coldness, and can be used to express a welcome relief in temperature. For instance, *hawa-i khunuk* is fresh or temperate air. Although in contemporary uses, *khunuk* can mean boring or uninteresting, in the late nineteenth century it was recorded that *khunuk* carried associations of cooling, comfort, but also happiness and good fortune. The verb *khunuk kardan* suggested both 'to render happy' and 'to cool.' Both *sard* and *khunuk* appear in period documents, often as near synonyms; for instance, within one paragraph in the Mughal *Ain-i Akbari*, the adjective *sard* is used to describe cold water, but when describing the cooling mats made of *khas*, the adjective *khunuk* conveys something 'cooling' and refreshing. Though not systematically, I have used the terms 'cold' and 'coldness' (similar to *sard*) more frequently to refer to states of temperature, and have employed the term 'cooling' (similar to *khunuk*) to capture the feelings of bodily comfort brought on by a change in weather or a refreshing scent.

Few objects remain, but the methods of cooling I discuss in this article were documented in texts and paintings primarily from sites in Rajasthan and the regions surrounding Delhi and Agra that experienced an arid hot season,

#BEYOND ICE



Painting attributed to Abd al-Vahhab.

that the Mughal rulers knew as 'Hindustan,' the experience of ice and cold was a luxury that only a few could access. The elite of the Mughal Empire (1526-1858), many of whom had connections to cooler climates in Iran and Central Asia, considered ice from the mountains, and grapes and melons from more temperate zones, as vital necessities for comfort and courtly enjoyment. Persian-language poetry circulating at the Mughal court lauded the refreshing temperature, pure water, crystalline air, and abundant fruits of summer retreats in Kashmir, in the foothills of the Himalayan mountains. During the long, dry, hot season, the imperial and regional architecture of northern Hindustan offered both passive and active cooling, including deep stepwells (*baoli*) and thick sandstone walls that absorbed daytime heat, keeping spaces cool inside. The tops of buildings were dotted with small domed *chhatris* roofs to provide shade, pierced jali screens allowed air through but filtered the sun; bountiful fountains and waterways flowed in shaded gardens; and pipes carried water beneath palaces to cool the marble floors. For those, who could not requisition ice from afar, did not reside in marble palaces, or could not make the journey to Kashmir in the summer, grass mats and lightweight fabrics, alongside music, fruits, and paintings, which conveyed refreshing abundance in

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the midst of the heat through texture, sight, taste, sound, and scent. While the cold has historically been theorized as the privation of warmth and cessation of sensory pleasure, the evidence suggests that the arrival of coolness, from lowering the temperature of the air to soothe the skin or the movement of a breeze from a fan, could also be an experience of plenitude, comfort and enjoyment in eighteenth-century Hindustan. The Persian terms used for coldness and cooling convey the different associations of these thermal states. The word *sard*, which is the basic Persian word for 'cold,' refers to a temperature or a state of being, such as a cold climate, but similarly to English, *sard* also carries emotional associations of a lack or loss of heat, passion, or even life. To become cold (*sard shudan*) also means to die, to become extinguished. A cold heart (*dil sard*) is one that is discouraged, whose spirits have been dampened. The word *khunuk* (cool) is a more moderate form of coldness, and can be used to express a welcome relief in temperature. For instance, *hawa-i khunuk* is fresh or temperate air. Although in contemporary uses, *khunuk* can mean boring or uninteresting, in the late nineteenth century it was recorded that *khunuk* carried associations of cooling, comfort, but also happiness and good fortune. The verb *khunuk kardan* suggested both 'to render happy' and 'to cool.' Both *sard* and *khunuk* appear in period documents, often as near synonyms; for instance, within one paragraph in the Mughal *Ain-i Akbari*, the adjective *sard* is used to describe cold water, but when describing the cooling mats made of *khas*, the adjective *khunuk* conveys something 'cooling' and refreshing. Though not systematically, I have used the terms 'cold' and 'coldness' (similar to *sard*) more frequently to refer to states of temperature, and have employed the term 'cooling' (similar to *khunuk*) to capture the feelings of bodily comfort brought on by a change in weather or a refreshing scent.

Few objects remain, but the methods of cooling I discuss in this article were documented in texts and paintings primarily from sites in Rajasthan and the regions surrounding Delhi and Agra that experienced an arid hot season,

rather than the humidity of tropical eastern Bengal or southern India. The focus on a variety of materials and sensory experiences is important for studying the question of cold or coolness. Heat and cold, the spectrum of the 'thermal,' operate beyond the accepted five senses. As Boon Lay Ong proposes, the thermal has a sensory aesthetics of its own. While coldness and heat are often associated solely with touch, the thermal encompasses phenomena beyond the tactile: the thermal sense communicates subtler, intangible information about fluctuations in air temperature, the presence of a refreshing breeze, or a heat transfer to or from the body. Lisa Heschong has argued in the context of architecture that pleasing experiences of thermal variation, what she terms 'thermal delight,' can be brought into architectural design with the same subtlety as shifts in dappled light.

However, the thermal also overlaps with and is enhanced by the other senses: as was theorized in parts of South Asia, and in the shared humoral medical theories that grew out of ancient Greek (Yunani) medicine, warmth or coldness emerge from distinctive physiological temperaments, and from flavors, fragrances, and cuisines. Evocations of coldness can be found in colour palettes, perfumes, and textures, although determining these meanings must be approached with an attentive



World Day to Combat Desertification and Drought

Imagine a world where the land stays healthy, and water is always enough for everyone. That's what the World Day to Combat Desertification and Drought aims for. Celebrated every year, this day is more than just a date on the calendar. It's a global call to protect our planet's land from becoming desert and find ways to fight drought. The United Nations set this day to remind us all of how important it is to keep our land rich and fertile. You can celebrate this day by raising awareness and show how to stop the land from worsening and help it recover. It's about sharing knowledge and working together to make sure that our land and water are protected for the future.



India moghul costumes.

ness to context, given that perceptions are not universally shared. Moreover, sensory experiences of the past and in different places are subjective and ephemeral and are impossible to reconstitute in full; what is left behind, as James McHugh writes in the context of his history of medieval scents, is often a poetic description or prescription for an 'ideal material world.' McHugh's caution about an idealized sensory experience also applies in this context, although the existence of paintings, actual objects, and more observational lexicons from the eighteenth century supplement the poetic or prescriptive accounts of cooling to give a broader sense of lived experience.

The scholarship on mitigating the heat in South Asia has historically focused on the complaints of Northern European travelers, soldiers, and later colonial officials who were unprepared for the dry hot season in northern Hindustan, or the humidity of tropical areas of South Asia, and sought technologies for cooling, first by the production and importation of ice and then by electrical air conditioning. However, as British accounts conceded, and as Mughal documents attest, the rulers and elite of Hindustan had put in place effective methods of cooling long before European intervention. Yet, by the early nineteenth century, the English-language press became dominated by British excitement over imported ice from the United States, that characterized local South Asian strategies of cooling as secondary and ineffective.

While emphasizing the sensory experiences of eighteenth-century individuals in Hindustan could seem to reinforce British and broader European stereotypes of the sensuality and bodily decadence of the 'East,' it is important to understand that these biases were closely tied to related Orientalist ideas about the determinism of the climate and heat of South Asia. Climatic determinism is the long-debunked idea that a region's climate (including temperature and humidity) determined the physical, medical, and cultural characteristics of its inhabitants. According to these deterministic theories, which became increasingly racialised in the nineteenth century, the qualities of 'feebleness' and 'indolence,' that British writers ascribed to residents of hot and humid regions of tropical South Asia, were derived from the climate. These ideas implicitly rejected extant local technologies for cooling the environment, given that part of the theory of climatic determinism was the idea that residents of hot climates were well adapted to the temperature, or the strong light of the sun. By this logic, they would not need to counteract the heat. A study of the non-European cooling strategies, that were used in South Asia, therefore not only recovers overlooked materials and multisensory phenomena from the past, but it also reasserts the scientific sophistication and aesthetic value of the manifold Hindustani methods of mitigating the heat, that were dismissed in the late nineteenth century by British colonial officers and visitors to South Asia.

To be continued...

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Jharokhas to keep cool.

#LIFESTYLE

Soaps' Soap? No!!

Handmade soapers are working to find skin-loving ingredients to create more beneficial soaps for our skin!

So, what's up with all of this natural soap anyway? Soap's just soap..... right? Wrong! Soap has been around since about 2800 BC in Ancient Babylon; the ruins of Pompeii revealed an entire soap factory. Frontier women made all of their own soaps from rendered animal fats (gotta use every piece of the animal to survive in frontier life!). Affordably manufactured soap was widely available by the 1800s.

Today, handmade soap has been increasing in popularity as people start to look for ways to return back to basics in our fast-paced technology-focused world, are becoming more educated about the products they bring into their homes, and start to look for natural 'cures' for common health issues.

But, what's the big deal about handmade soap vs our modern-day commercial soap? Is natural soap better than commercial soap? Let's take a look at each one and then decide.

What's so bad about Commercial Soaps anyway?

Many commercial soaps aren't soaps, they are synthetic detergents. Detergents originated in 1916 Germany, and the commercial 'soap' we know today came into existence during WWII. Detergents are synthetic (often petroleum-based) cleansers that strip your skin of the natural oils that your body needs for healthy skin and can lead to skin disorders and rashes.

Commercial Soaps Contain More Than Just Soap

Even if you do find a bar of real soap at the store, it might not be all that great for you. Many commercial soaps contain chemical-based colourants, dyes, fragrances, lathering agents, preservatives, and other 'things' we can't pronounce. These additives can wreak havoc on our sensitive skin and hair, and pollute our drinking water. Some commercial 'soaps,' toothpaste, and body washes even include triclosan, which can promote cancer (pretty scary stuff, and you can read more about it if you want to get squeamish about some of the products we are sold).

Commercial Soap Lacks Glycerine

With all of the work commercial soap manufacturers put into adding 'things' to their product, you wouldn't think they would spend time extracting from it, but they do. Glycerine is a naturally occurring by-product of the saponification process (that's the chemical reaction that we call soap making). Glycerine is a humectant, meaning it draws moisture from the air to your skin, leaving your skin soft and moisturized.

Commercial soap manufacturers typically remove the glycerine from their soap, and sell it separately, or use it in a second product-moisturizer. Yup, they take one good bar of soap, extract the moisturizer, and then sell it to us as a second product (both of which may contain harmful chemicals).



What is Organic Soap?

Organic soaps are natural products that are good for your skin. Soap is a pretty basic chemical reaction: it's a salt of a fatty acid. In order to make soap, fats and lye are combined in a process called saponification. You take some lye, some fat (animal or vegetable oils), heat it up, and BAM soap! OK, we simplified it, but you get the idea. Soap is a natural process that comes from combining natural ingredients.

Organic soap is made of vegetable oils (sometimes animal fats too) and butters that are rich in antioxidants, vitamins, and nutrients that are essential to healthy skin. And, real handmade soap contains glycerine. You won't find any soap out there extracting all the goodies from their soap to upsell you the 2nd product. On the contrary, handmade soapers are working hard to find wonderful skin-loving ingredients to create more and more beneficial soaps for our lovely skin.

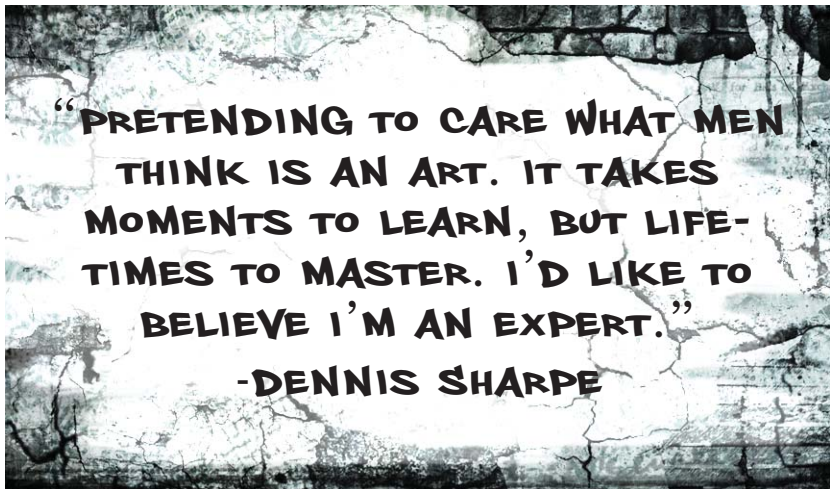
Organic soaps are more sustainable: Sustainability is a responsibility that lies with both the producer and the consumer. As brands should start shifting towards more sustainable production practices, consumers should also consume sustainably. The very foundation of organic products is that their source material is produced without the addition of chemical pesticides and fertilisers, this means that in supporting these efforts, we are contributing to

healthier soil, water and air. Organic soaps are safer to use. 'Normal soaps' use sulphate based detergents to create the effect of 'building up a lather.' But this is nothing more than a marketing gimmick, because in reality, it is not a thick lather that cleanses your skin, but the natural oils that can penetrate deeply and purge your pores of chemical toxins. Think about it, when you put on makeup, why do people suggest that you remove it with oils instead of washing it off your face with hand soap? Organic soaps are often composed of natural oils, like coconut, jojoba and hemp seed, all of which have the potential to penetrate your pores and cleanse your skin from the inside out.

Organic soaps are beneficial to your skin: Because of their composition, which tends to be natural oils packed together using the methodology of traditional soap making, which is the hydrolysis of a triglyceride fat (natural organic oils) using a base (lye), organic soaps are packed with natural goodness. A hemp seed oil based organic soap, for example, will not only have the natural moisturizing and deep cleaning properties of hemp seed oil, but it will also have its added benefits such as helping to balance hormones that can help with acne and eczema, stress relieving properties as well as antibacterial properties and the ability to regulate blood sugar!



THE WALL



BABY BLUES



By Rick Kirkman & Jerry Scott



ZITS



By Jerry Scott & Jim Borgman