

感受皮肤

The Skin You're In



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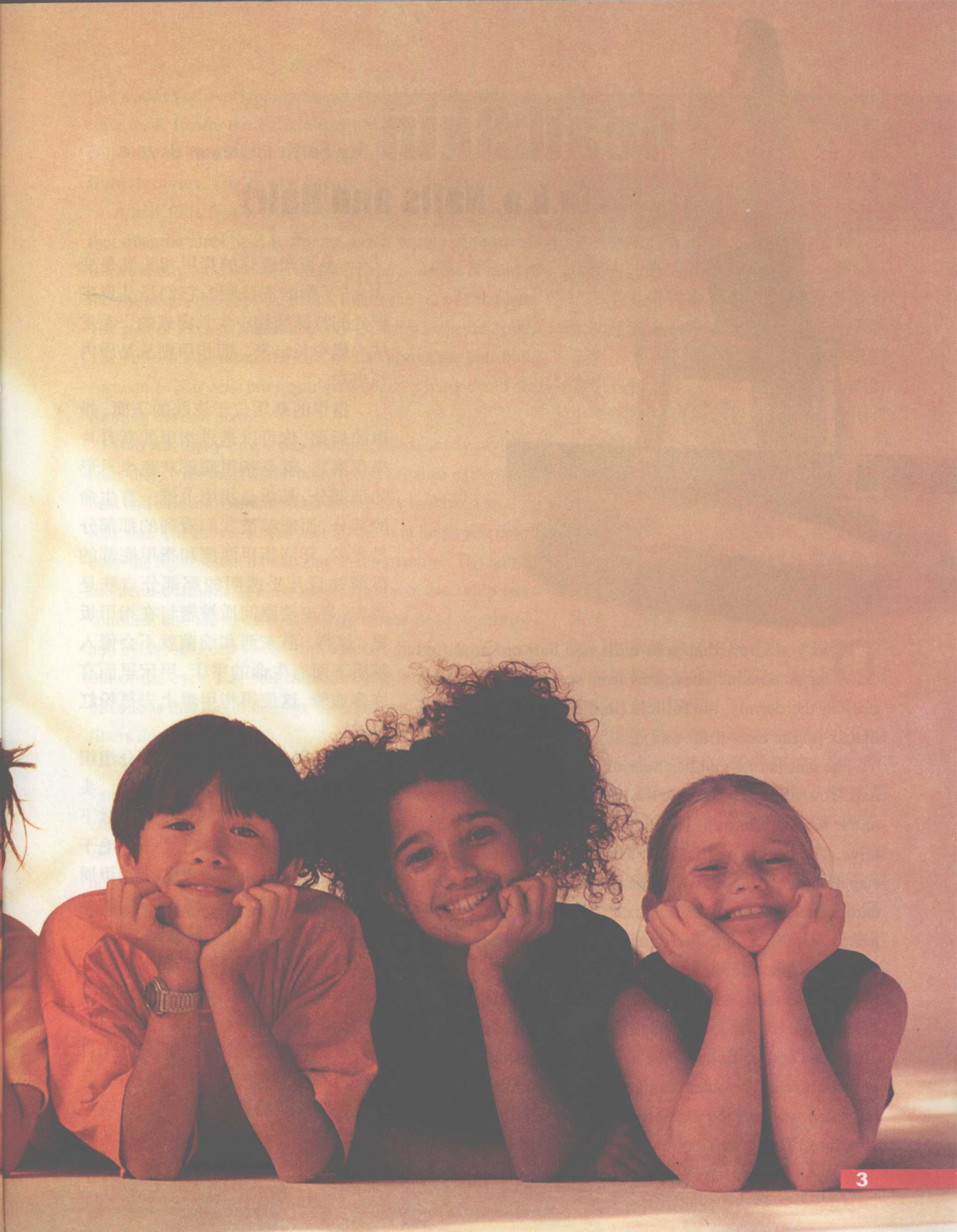
皮肤不只是使人美丽。从象牙白到黑巧克力的颜色，皮肤真的很神奇。皮肤是人身体最重要的组织，担负着重要的工作，从感觉疼痛、温暖的拥抱，到保护身体免受有害物质和疾病的危害。皮肤能防止身体水分流失，使身体在运动时伸缩自如，帮助人体在高温时降低体温。

许多人没有对皮肤这一珍贵的组织引起足够的重视，让皮肤暴露在冬日的

寒风之中和夏日的骄阳之下；在皮肤上扎很多小洞，注入墨水做纹身；进行日光浴，伤害皮肤细胞。请记住，要呵护自己的皮肤，善待自己的皮肤：在夏日临近、阳光变得强烈时，要使皮肤尽量少受阳光的灼伤；在冬日到来之时，不要让皮肤暴露在寒冷干燥的北风之中。

请记住，你只有一层皮肤，好好对待它吧。







Dead Skin

by Faith Hickman Brynie

(a.k.a. Nails and Hair)

你是否知道你的指甲和头发是变了形的皮肤呢？它们是从真皮深处的特殊结构中生长出来的。毛发从毛囊中长出来，而指甲则从基质内长出来。

指甲的基质位于皮肤的下面、指甲的后面。你可以透过指甲的新月片来观察它，就是指甲底部灰色半月形的那部分，基质是指甲上惟一有生命的部分，而能够被我们看到的那部分是死的。环绕指甲两侧和指甲底部的很薄并且几乎透明的那部分皮肤是表皮。表皮使胞间质被密封在指甲板里，这样，脏东西和细菌就不会侵入基质下面有生命的甲床。甲床里面有许多血管，这使得指甲看上去是粉红色的。

像指甲一样，毛发的大部分组织也是由坚韧有力的角蛋白组成的。头发也是死的皮肤。如果你从头上揪下一根头发，那你就失去了毛干。毛干由三层组成，外壳称为表皮。（指甲周围的皮肤也被称为表皮，但它们的结构却不一样。）在电子显微镜下观察，表皮就像是互相重叠的一系列的组织，就像是屋顶上的瓦片一样。表皮里面的一层被称为皮层，即包含角蛋白的一排细胞。毛发的强度大部分就来自它的皮层。毛发的核心部分是髓质。

毛囊就是皮肤表面下面一个微小的袋状物。毛囊里面会长出头发，毛

Did you know that your nails and hair are modified forms of skin? They grow from specialized structures deep in the dermis: the follicle (in the case of hair) or the matrix (in the case of the nail).

The matrix of a nail lies beneath the skin and behind the nail. You glimpse it through the lunula, that pale half-moon at the base of the nail. It's the only part of the nail that's alive. The visible part is dead. The thin, nearly transparent flap of skin surrounding the sides and base of the nail is the cuticle. It seals the matrix to the nail plate and keeps dirt and germs from invading the living nail bed beneath it. Blood vessels are plentiful in the nail bed, making nails look pink.

Hair, like nails, is made mostly of the strong, tough protein keratin, and it's dead, too. Pluck a single strand of hair from your head and you've lost the hair shaft. The shaft is made of three layers. The outer casing is called the cuticle. (This is the same word as the skin around nails, but not the same structure.) Under an electron microscope, the cuticle looks

like a series of overlapping layers, something like shingles on a roof. Inside the cuticle lies the cortex, a column of cells containing keratin. The strength of hair comes mostly from its cortex. The central core of the hair is the medulla.

A hair follicle is a tiny pouch below the skin's surface that manufactures hair. It obtains a rich supply of nutrients from the tiny blood vessels that surround it. At the bottom of the follicle is the papilla, which forms the root of the hair. The part of the hair that is actively growing is the hair bulb. The cells that generate the hair lie just above the hair bulb. As soon as hair cells are manufactured, they harden and die, forming the hair shaft.

Hair has many functions. The fine, short, nearly invisible hairs that cover most of the body protect against extremes of heat and cold and combat water loss. Body hair has a sensory role, too. The movement of hair on the skin helps you detect even the lightest touch or change in temperature. The hair on the head cushions against blows, protects the scalp from sunburn, and slows loss of heat from the head. Eyebrows and eyelashes keep sweat, dirt, insects, and foreign objects out of the eyes. Ear hair traps dirt and insects and blocks infections that might damage the inner ear. Hair in the nose filters dust and germs.

Nails have important functions, too. They protect the sensitive ends of fingers and toes from injuries and chemicals, help in grasping and plucking small objects, and aid the sense of touch. Although nails are dead and have no nerves, the nail bed beneath is remarkably sensitive to the impact signals that come in when you type or play the piano. Nails can be tools for construction or weapons for defense. And they're just the thing when an itch demands a scratch.

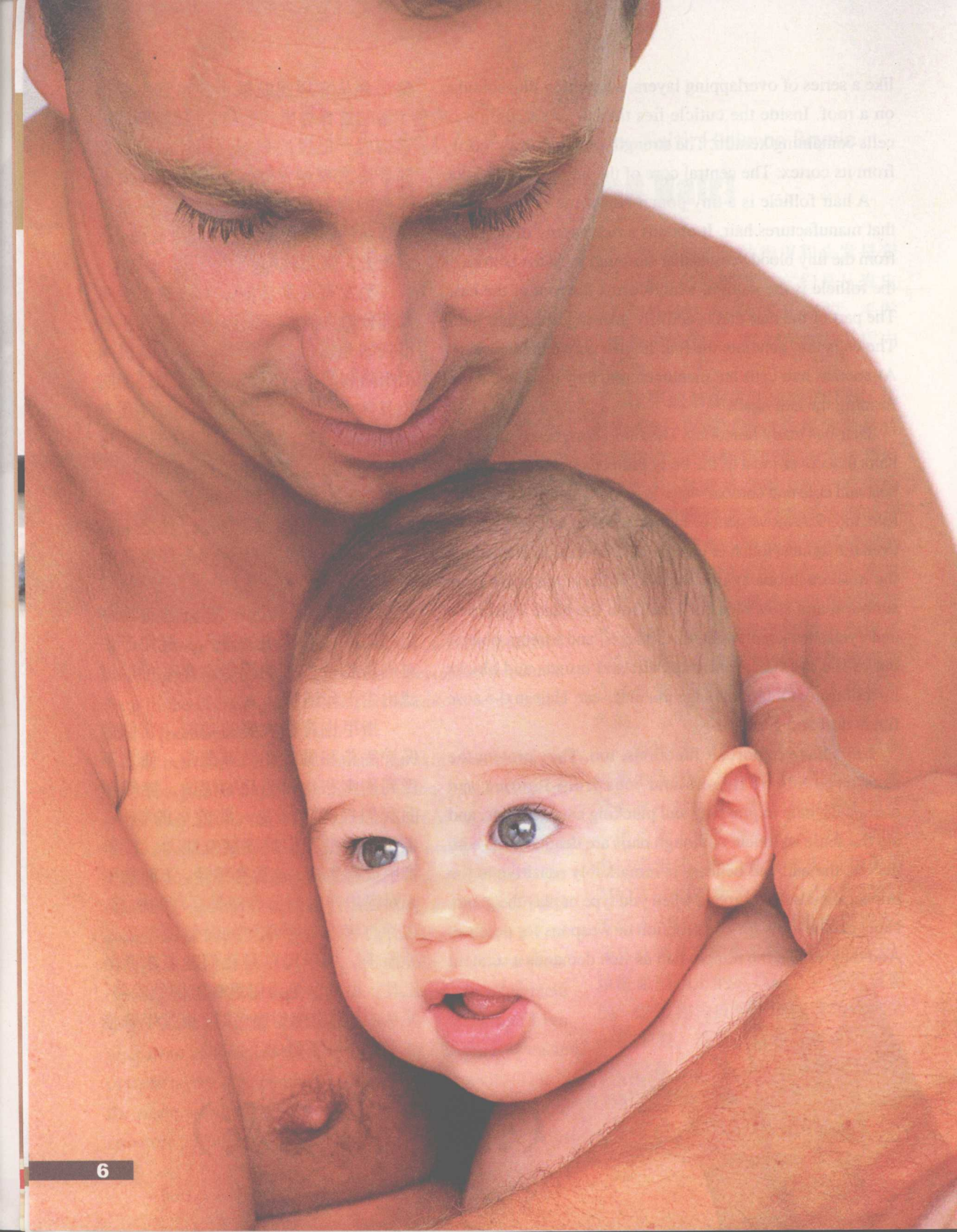
囊还会从它周围的微小的血管中获得丰富的营养物质。毛囊的底部是乳突，它构成了毛发的根部。茁壮成长的那部分毛发就是发球，能够长出头发的那些细胞就位于发球的上部。一旦毛发细胞被制造出来，它们就会变硬，然后死去，最后就形成了毛干。

毛发有许多功能。那些遍布全身大部分地方的精细、短小、肉眼几乎看不到的毛发保护着身体，抵御着极端的炽热和严寒，同时，这些毛发还能防止身体水分流失。身体上的毛发还有一种感知功能。皮肤上毛发的运动帮助你觉察到最微弱的接触或温度变化。头上的毛发像一个垫子，保护头部，使之避免受到撞击；保护头皮，使之不被太阳光灼伤。它还能减缓头部热量散失的速度。眉毛和睫毛能够防止汗水、灰尘、昆虫和异物进入眼睛。耳毛能够阻挡脏东西和昆虫的进入，避免产生对内耳构成损害的感染。鼻毛可以过滤出尘土和细菌。

指甲也有很重要的功能。它们会保护手指和脚趾的敏感部位，使之不受到伤害和化学药品的侵蚀，能够帮助我们拦截和捕获一些微小的物体，也能够帮助我们提高触觉能力。尽管指甲没有生命，也没有神经，下面的甲床对撞击产生的信号却是异常的敏感。在你打字或者弹钢琴的时候就产生这种撞击。指甲可以是建造东西的工具，也可以是我们用来防御的武器。并且，当哪里感到瘙痒时，用指甲来挠一下是再好不过的了。



死皮肤（指甲和毛发）



Skin to Skin: The Science of Touch

by Margaret A. Hill

Imagine a life without touch. No warm hugs or affectionate kisses. Forget reassuring pats on the back. Erase the desire for the warmth and silky softness of a pet's fur or a soak in a hot tub. None of those pleasurable sensations would exist in a touch-deprived world.

Unpleasant sensations would be out of our experience range, too. But who would miss itchy mosquito bites, the sting from a doctor's needle, or the jarring vibrations of a dentist's drill?

Still, if you took a poll, it's likely that most people would choose to keep their sensation of touch, even though pain and itching come as part of the package. There's a biological wisdom in that desire to hold on to our touch sense — it represents a vital biological line of defense, one that we cannot live without.

WHAT IS TOUCH?

Our whole body is wired for touch. A variety of specialized receptor cells lie just underneath the

想 一想没有触觉的生活会是什么样的。没有了触觉，你就无法体会到热情的拥抱以及激动的亲吻是什么滋味。你也不用再想有人会赞许地轻拍你的后背了。你更无从去体会到抚摸宠物以及将身体浸泡在浴缸中所带来的温暖和轻松的感觉了。在一个没有触觉的世界里，这些令人感到愉快的感官刺激是不会存在的。

同样，丧失了触觉后，我们也不会感受到那些令我们讨厌的感觉了。但又有谁渴望得到被蚊子叮咬的瘙痒的感觉、被医生针扎的感觉以及牙医的电钻所带来的麻酥酥的感觉呢？

尽管如此，如果你进行一项民意调查的话，大多数的人仍然会选择保留他们的触觉，尽管疼痛和瘙痒的感觉也是触觉的一部分。从生理学的角度，我们可以明白人类为什么渴望保留触觉。触觉代表了我们至关重要的一道生理防线。而我们的生活是离不开这道生理防线的。

触觉是什么？

我们的整个身体都遍布触觉的感受器。在

从皮肤到皮肤： 触觉的科学

skin's outermost layer and detect environmental signals such as pressure, heat, and cold. Although the numbers of receptors vary from one area of the body to another, the entire sheath of skin can be compared to a giant switchboard loaded with millions of sites, each wired to a central computing center, the brain.

In a process that is complex and not fully understood, a touch sensation starts with individual receptors under the skin surface detecting some stimulus from the environment. Stimulated receptors then fire off messages that zip up to the brain, where they are interpreted. Depending on the combinations of receptors triggered, the brain can distinguish hundreds of different sensations.

Receptors include numerous varieties within four basic categories of function—

- **Pressure.** When someone taps you on the shoulder or tickles the hair on your arm, your mechanoreceptors sense the pressures involved. Mechanoreceptors are sensory neurons found below the surface of the skin or wrapped around hair follicles embedded within the skin. Other mechanoreceptors wired to skeletal muscles, joints, tendons, and ligaments detect body movements and positions.
- **Heat.** The campfire you huddle up to on a cool summer night sets off a set of skin receptors that specifically sense warm temperatures. Mmmm... feels good! But shift yourself a bit closer to the fire, and that comforting warm feeling gives way to a painful burning sensation. A new set of receptors that do double duty becomes activated, signaling both heat and pain. Both sets of thermoreceptors are part of a large group of receptors that sense heat, each type tuning in to a different temperature range.

皮肤最外面的一层下面就有各种感受器细胞。它们可以觉察出压力、冷热等环境信号。尽管身体各个部分的感受器的数量并不相同，皮肤的整个外壳可以被比作一个巨大的交换机，上面有几百万个地址，每一个地址都与中心电脑相连，这个电脑就是人的大脑。

皮肤表面下的单个感受器从环境当中感觉到了某种刺激，于是触觉就产生了。但它产生的过程是复杂的，并且人们还没有完全了解这一过程。受到刺激的感受器随之发出信息，而这些信息立刻被传送给大脑，这些信息在那里得到了处理。根据被激发的感受器之间的不同组合，大脑可以分辨出几百种不同

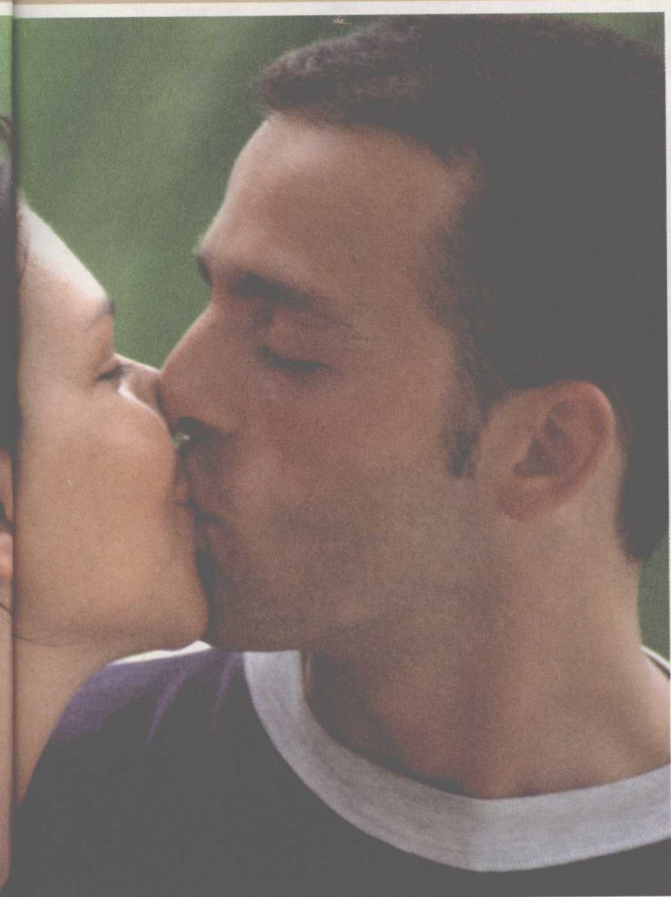


- **Cold.** Another group of thermoreceptors detects cold. Like receptors for heat, cold receptors vary according to the range of temperature they recognize. And, some can signal both cold and pain. Plunge your hand into a bowl of ice water, and you'll quickly get a combined cold/pain message from such receptors.
- **Pain.** The skin is loaded with pain receptors (called nociceptors), some of which are coupled with temperature detection, while others signal when tissue damage occurs. Of the damage-sensing type, there are those that lead to prickling, stinging sensations as in the case of

的触觉信息。

感受器包括许多不同的种类。按照功能，它们基本可以被分成四类。

- **压力** 当有人拍你肩头或者抓弄你胳膊上的汗毛时，你的机械感受器就会感受到其中产生的压力。这些机械感受器是一些感觉神经细胞，位于皮肤表面的下方，或者被包裹在镶嵌到皮肤中的毛囊的周围。其他的机械感受器同骨骼上的肌肉、关节、肌腱和韧带相连，可以感觉到身体的运动和位置。
- **热量** 在凉爽的夏日夜晚，当你燃起一堆篝火时，你就会使一系列的皮肤感受器活跃起来。这些感受器是专门用来感受较高的温度的。嗯，感觉不错！然后，当你向篝火靠近一些时，那种令人感到舒服的、热乎乎的感觉就消失了，取而代之的是一种令人痛苦的灼烧的感觉。这时，执行双重任务的新的一套感受器就被激活了，它们让我们同时感受到热量和疼痛。这两套热感受器都是一大组热感受器中的两部分。每一种感受器都能够感受不同的温度范围。
- **寒冷** 另外一组热感受器能够感觉到寒冷。就像感觉热量的感受器一样，根据温度范围的不同，感受器也有所不同。并且，另外一些感受器既能感受到寒冷，也能感受到疼痛。如果你把手突然放到一碗冰冷的水中，你很快就能够从这些感受器同时接收到寒冷和疼痛的信息。
- **疼痛** 皮肤上到处都是感觉疼痛的感受器(疼痛感受器)。它们其中的一些能够感觉到温度的变化，另外一些在组织受到伤害时就会发出信号。在感觉伤害的那部分感受器当中，有一些能够让人感到刺痛或被叮咬的感觉(比如在皮肤被划伤的时候)，有些感受器能够对化学变化起反应，让人有瘙痒和灼烧的感觉。



a skin cut, and still others that respond to chemicals to produce itching or burning sensations.

VITAL TO SURVIVAL

Anyone who has ever accidentally picked up a hot dish knows that it takes only a second or two to realize their mistake. Ee-ow! We don't like getting burned, but the pain serves to warn against further harm. Without our sense of touch, we would be unaware of dangerous situations until it was too late to prevent serious or even life-threatening injury.

Touch is also essential for normal development. Experiments performed on monkeys in the 1950s, and now considered too cruel to ever repeat, showed that infants need their mother's touch. Psychology professor Harry Harlow of the University of Wisconsin (Madison) isolated baby rhesus monkeys at birth and placed them in cages with mother substitutes made from chicken wire. Even though Harlow's "wire" mothers were rigged to deliver milk on demand, his infant monkeys visited them only when hungry. The monkeys spent virtually all of their time hugging and snuggling up to "cloth" mothers, which consisted of chicken wire wrapped in soft terry cloth.

Harlow's experiment effectively separated the nursing function from the touch function of mothering and revealed for the first time just how important touch is to infant development.

His work inspired more research into the science of touch. We now know from animal studies that positive touch experiences — hugging, rocking, and playing — are essential to the normal emotional and social growth of infants. Without normal touch experiences, infants grow up to become withdrawn adults who are unable to interact with their peers or even provide proper mothering behavior toward their own babies.

Human studies also show benefits arising from

生死攸关

任何一个在不经意间拿起一个热盘子的人都知道，只需要一两秒钟他们就会认识到自己所犯的错误。哎哟！我们可不想被烧伤。疼痛的感觉给我们提出警告，使我们避免受到更大的伤害。如果没有触觉的话，我们就不会意识到危险的存在，而我们要避免严重甚至是危及生命的伤害时已经是为时已晚了。

触觉对于人类的正常发育也是至关重要的。在20世纪50年代，有人在猴子身上做了一个实验。而现在人们认为这一实验非常残酷，不能再重复做了。这一实验显示婴儿需要母亲的抚摸。威斯康星大学（麦迪逊市）的心理学教授哈里·哈罗在猴子出生的时候就把这些猕猴隔离开来，并把它们放在笼子里，与那些铁丝网做的母亲的替代物呆在一起。尽管哈罗的“铁丝网”母亲也能在需要的时候给猴子喂奶，那些小猴子只有在饥饿的时候才去找这些母亲。这些猴子几乎把自己所有的时间都花在拥抱和偎依那些“布母亲”上。这些假母亲是用柔软的毛巾包裹的铁丝制成的。

哈罗的实验把育儿阶段的哺育功能和抚摸功能有效地分离开来。并且，这一实验第一次向人们揭示出抚摸对婴儿的发育是多么重要。

他的工作进一步激励人们对触觉科学进行更深入的研究。从对动物进行的实验中我们了解到，积极的抚摸（拥抱、摇晃和玩弄）对婴儿正常的情感和社交发育是必不可少的。如果没有正常的被抚摸的经历，这些婴儿长大后就会变得性格孤僻，不能和同龄人交往，也不能以合适的方式抚养他们自己的孩子。

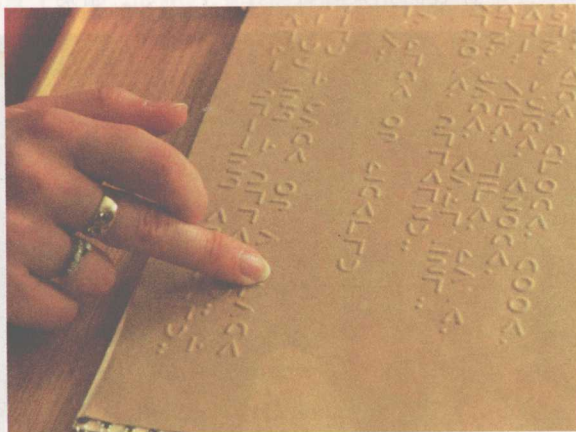
对人类进行的研究也显示出抚摸所带

touch. Premature human infants gain more weight and develop faster when their bodies are massaged regularly. Massage therapy helps aggressive adolescents reduce their violent behavior. Comparisons of different cultures suggest that lower rates of adult aggression occur in societies that tend to be very physically affectionate toward children.

The science of touch is complex and still a long way from being completely understood. Unraveling the details will be useful as well as fascinating.

来的各种益处。未成熟的婴儿的身体如果经常被抚摸的话，他们的体重就会增加，并且成长发育得也比较迅速。按摩疗法能够帮助那些好斗的青少年减少他们的暴力行为。根据各种不同的文化进行的对比显示，在那些强调从身体上对孩子们表现出爱抚的社会中，成年人的暴力倾向出现的比例就会小一些。

触觉科学十分复杂。我们还远远没有完全地了解它。揭开这一现象的秘密不仅十分有用，而且令人感到激动。



Touching to See 靠触觉去看

In Moon Braille, words are spelled with raised symbols that approximate the shape of printed letters.

在月亮盲文中，单词是由各种突起的符号拼写而成的。而这些符号的形状同印刷的字母的形状十分接近。

Have you ever marveled at the ability of the blind to read Braille? How do they make any sense out of those tiny bumps? They must have developed greater skin sensitivity to compensate for their loss of sight, right?

Wrong! Skin tests administered to sighted and sight-impaired individuals show no significant differences between the two groups either in sensitivity to pressure or in numbers of skin receptors present in the skin. Blind people operate with exactly the same skin sensory equipment as everyone else. They are simply more tuned in to channels of communication that involve the sense of touch and have learned to use them with more ease.

你是否对盲人阅读盲文的本领感到过惊讶呢？他们怎么能够明白这些小小突起的意思呢？这些盲人一定是培养出了较强的皮肤敏感力来弥补他们视力上的欠缺。对吗？

不对！对视力正常和视力有缺陷的人所进行的皮肤检测表明，在视力正常和视力有缺陷的人之间并不存在对压力的敏感性的巨大差异。他们皮肤上的感受器的数量也没有明显的差异。盲人使用的感觉器官与正常人的是一样的。他们只是对那些涉及触觉的通讯渠道更加适应并且能够更加轻松地去使用这些渠道。

Itching vs. Tickling

by Jacquelin Cangro

As far as the body is concerned, a tickle and an itch begin the same way. Both sensations have the same physiological response. Tickling and itching, called pruritus, start with a stimulus that irritates the skin. The stimulus can be microscopic dust, bugs, bacteria, someone else's touch, or a host of other things.

就身体而言，胳膊和瘙痒的产生方式是相同的，两种感觉有着同样的生理反应。胳膊和搔痒这两种反应都被称为瘙痒，产生于一种令皮肤感到不适的刺激。这些刺激物可以是在显微镜下才能观察到的灰尘、虫子、细菌，也可能是他人的触摸以及许多其他的东西。

让我们先来看看瘙痒吧！例如，如果一只



瘙痒和胥肢

Let's look at itching first. For example, if a creepy crawler climbs up your leg, thousands of tiny receptors under the skin's surface become irritated. The skin's defense mechanism kicks into action and alerts you to scratch the spider away, hopefully before you're bitten. Once you rid yourself of the bug or other irritant, the brain gets the signal that the threat is gone and tells the skin to stop itching. Even if the irritant, such as a clothing tag, is still there, the act of scratching focuses the attention of the skin's receptors on the scratching, rather than on the irritant. Strong scratching feels satisfying because blood rushes to the skin and disperses the sensation of the itch.

While itching and tickling start for the same reasons, the responses are certainly different. Laughter is the natural response to a tickle. Robert R. Provine, a professor of neuroscience and author of *Laughter: A Scientific Investigation* (Viking Press, 2000), thinks that the tickle is a form of communication and social interaction. Most ticklers and ticklees recognize it as a way to show affection. That's why a person doesn't respond by trying to scratch the tickle away. "If you think the social component is not important, try tickling a stranger," says Provine.

If tickling is fun and affectionate, then why can't people tickle themselves? Although scientists haven't been able to pinpoint the answer to that question, they think that it is because of the cerebellum, a part of the brain that controls movement. The cerebellum is aware of the sensations of all the body's movements and knows to prepare the person for the anticipated tickle.

爬虫爬到了你的腿上,皮肤表层下成千上万的微小的感受器就会受到刺激。皮肤的防御机制就会立即启动,使你警觉,告诉你赶快把那只蜘蛛之类的挠掉。但愿你在它咬你之前就能把它挠走。一旦你把虫子或其他的刺激物清除后,大脑就会收到信号,了解到危险已经消除,并且告诉皮肤不要发出瘙痒的感觉。即便是像衣服标签这样的刺激物仍然停留在那里,抓挠的动作也只是让皮肤感受器把注意力放在抓挠上面,而不是放在刺激物的上面。用力抓挠会使我们感到舒服一些,因为血液这时流到皮肤那里,分散了瘙痒的感觉。

尽管瘙痒和胥肢产生的原因是一样的,但这两种反应肯定是完全不同的。胥肢使人产生的自然反应是大笑。罗伯特·R·普罗文是一位神经学教授,也是《大笑:一项科学调查》(维京出版社,2000年出版)一书的作者。他认为胥肢是一种交流和社交方式。大多数胥肢别人的人和被胥肢者认为这是一种表达爱抚的方式。这就是为什么被胥肢者不会做出想把胥肢挠走的反应。普罗文说:“如果你认为胥肢的社会功能并不重要,那你就去试一试胥肢一名陌生人吧。”

如果说胥肢很有意思并且能够表现出爱心,那为什么人们不能胥肢自己呢?尽管科学家还没有找出这一问题的答案,他们觉得这是因为小脑(人脑的一部分)在控制着动作。小脑能够感觉到身体各个部分的运动并且知道何时让人们为将要受到的胥肢做好准备。



Second Skin

by Jennifer Savedge

Sarah Yeargain had never really thought about her skin before, until the day it started to fall off! The young woman from San Diego lost nearly all of her skin—and her life—due to a rare allergic reaction to her sinus medication. Her skin was literally peeling off in sheets, and without skin, she would die. But thanks to the application of an artificial skin, doctors were able to stop the reaction and save her life.

YOUR BODY'S FRONT LINE

Our skin is our armor. “The skin is your first line of defense against the outside world,” says Doris

莎拉·耶根以前从来没有真正地关心过自己的皮肤，直到有一天她的皮肤开始脱落。由于在治疗鼻窦过程中所产生的一种罕见的过敏反应，这位来自圣地亚哥的年轻妇女几乎失去了自己所有的皮肤，甚至差一点丧了命。她的皮肤真的一片一片地开始脱落。失去了皮肤，她就会死去。但由于使用了人造皮肤，医生们能够制止这种过敏反应，拯救了她的生命。

你身体的前线

我们的皮肤就是我们的铠甲。一位医学博士，多丽丝·J·戴，纽约大学医疗中心皮肤科

第二皮肤