TOKYO FIBER

SENSEWARE

引人兴趣的媒介

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SENSEWARE的意义

原 研哉 策展人

寻找应用物

今天，新材料层出不穷。新材料也许颇具吸引力，但我们却总要面对这样一个问题：如何才能物尽其用？无论是从技术上还是从大和民族的细腻敏感上来说，日本都必定会成为人造纤维发展历程中的领军者，所以，各种革命性的高端新纤维接二连三地在日本诞生。由于期待看到这些新纤维可能产生的实际效益，人们普遍对如何使用它们兴趣盎然，尤其希望看到新纤维的应用产品。然而，没有好的创意，再高级的材料也是枉然，其潜力难以为众人所知。因此，本次展览特地为设计者和技术人员提供了一次机会，与这些充满魅力的新型人工纤维亲密接触，鼓励他们思考如何在实际应用中将这些材料的优点呈现出来，这也是本次展览的目的。2009东京纤维展期待通过这种方式在最大程度上与世界分享未来制造、展示由人造纤维构成的全新“环境膜”(environmental membranes)的各种想法。

展出的这些创新纤维和织物，新颖之处在于，它们要么是只有人类发丝粗细的七千五百分之一，极其纤密的纳米纤维；要么是轻得超乎人想象，却具有一定硬度、强度和弹性的碳纤维；要么是导电性堪与金属媲美的导电纤维；要么是能够被制成立体形态的可模压纤维；要么就是替代传统的经线和纬线的纺织方式，用三根纱线以60度交织而成的三轴纺织纤维。还有一些，可以被称为智能纤维，因为它们与动物组织或细胞一样复杂而精密。值得强调的问题是：我们能为这些纤维找到何种应用的途径？

SENSEWARE

什么是SENSEWARE？我定义它为那些能激发人类创造性本能并唤醒造物欲望的东西。一个极佳的例子就是石头在石器时代所扮演的角色。当你手握石斧，感受它的沉重，关注它的坚硬时，你会感觉到手中这把石斧唤醒了某种深藏在心底的东西。在人类学会直立行走之后，重获自由的双手必定是将石头作为了一种非常特殊的媒介，因为它不仅分量适宜，而且还具有一定的功用，人们可以用它来砍砸东西。通过触摸石头，刺激了人类设计和改变身边世界的欲望，石器时代的文化由此开启。手握一件石质工具，你会本能地理解这一过程。

另一种不可思议的媒介是纸。虽然用来制作纸的自然原料是大地提供的颜色，但纸却是白色的，并具有一定的紧实度。尽管如此，纸张的洁白色泽和紧实度却很容易被破坏。倘若拿到细腻精致的白纸，人们总是喜欢在这种极易破损、沾污的材料上蘸着黑色墨汁书写或绘画，为之留下不可逆转的印记。此后，这种令人惊奇的对比便成为了人类创造欲望的驱动力之一。

自然纤维如棉、亚麻和丝绸同样能激发人们的巨大创造力。它们柔软、温暖，以各种令人眼花缭乱的搭配变化，借助染色的方式获得的色彩，刺激了人们对于服装的需求，并已远远超过了遮羞保暖的基本需要。自现代以来，随着大众文化的兴起，时尚形成了一个独特完整的领域，服装则成为体现人们生活方式的符号。

人造纤维是一种新SENSEWARE

一旦人造纤维变得唾手可得，它们便在服装制作中替代了自然纤维。尼龙之所以能被用来制作织物，是因为它不仅具有丝绸般的光滑与光泽，而且更加强韧，更适于大规模生产。此后又出现了聚酯纤维和亚克力，使用它们制作的衣物既耐久又耐磨，制作简单同时又能高效产出。很快，它们便成了服装加工不可或缺的材料。日本曾一度是向全球供应人造纤维的主要国家，但很快，韩国和中国台湾便替代了这一角色。今天，韩国和中国台湾同样也退出了这一领域，取而代之的是中国大陆和印度。如今，在衣物上使用的大部分人造纤维都是由劳动力成本较低的国家制造的。

在人造纤维供应国发生变化的同时，日本的人造纤维开始向更先进和高技术的方向发展，这使得人造纤维能够超越服装领域，找到更为广阔的应用空间。人造纤维的应用总体上呈现出从服装领域转向环保材料的趋势，而且越来越多的应用得以实现。例如人造血管、飞机机身、水过滤膜、游泳衣、运动鞋，以及一些高级服装等。人造纤维产业还延伸到一些边缘领域，譬如智能材料。相比于传统材料，智能材料更强调材料的结构和功能，而非外观与材料给人带来的触感体验。今天的人造纤维能够提供传统自然纤维难以企及的更多性能，在诸如精巧程度、灵敏度、可成型度、刚性/韧性，以及灵活表现等方面尤为明显。人造纤维发展现状预示了它们未来光明的前途，未来的人造纤维将是一种全新的SENSEWARE，它们会像皮肤细胞那样成为我们周围环境的界面。

创造性人才让材料的潜力得以显现

本次展览由七家日本纤维制造商联合主办。每家公司都提供了一份详细介绍，解释了各自生产的高级纤维的特点。在对制造商们所提供的材料特性进行了仔细分析后，我缩小了候选材料的范围，以适应本次展览的需求，与此同时，我还确定了合作进行设计的创作者。所选择的纤维和创作者是否匹配，将会关乎本次展览的成败。最终，我邀请了十五位创作者和两家公司参与创作，其中包括从事建筑、室内设计、产品设计、艺术指导及媒体分析等各方面的专业人士，以及一家汽车制造商、一家高科技家用电器制造商、一位花艺师和几位时装设计师。选择公司成为本项目的创作者，并不会产生矛盾。

如果非要说存在什么矛盾，那就是高科技公司往往是通过将高科技和感受性相结合，才将创造力转化为产品。而在此展出的产品，都是参与创作的设计师的创造力和人造纤维的潜力交融后获得的成果。

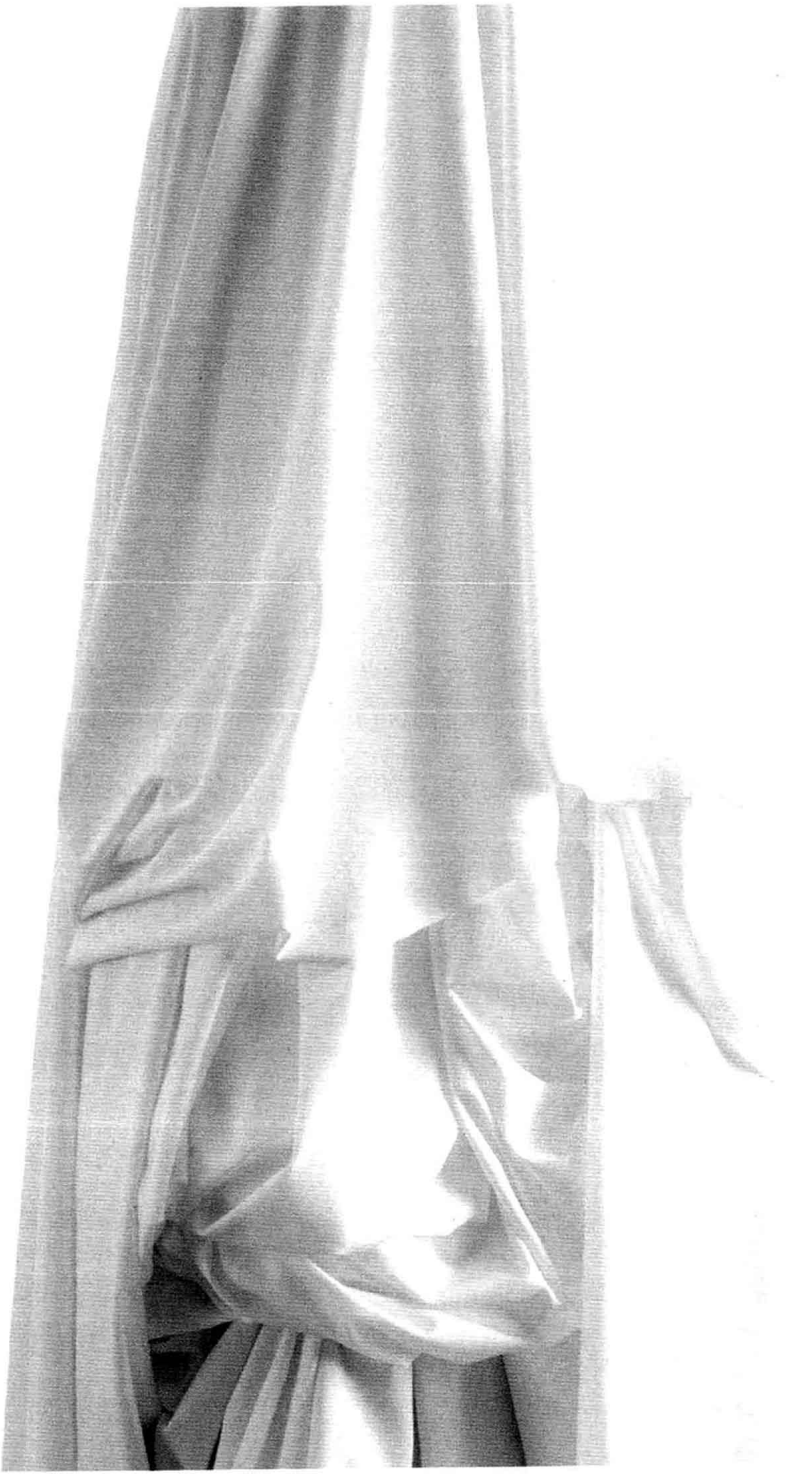
这些展品的付诸实现，有赖于与许多小公司的通力合作，它们分别是某类制造技术的专家。展品中所用的技术主要涉及无纺织物与使用模具的三轴织物的压制成型技术，为超细纤维染色所需的激光喷墨技术，碳纤维成型技术，制作“微笑汽车”所需的“电子人偶技术”（animatronics），激光切割技术，在混凝土中植入光纤并对混凝土进行切割的技术，机器人设计和高级传感技术，精密金属加工技术，以及让靠背从沙发里升起的技术。正是这些小公司能够理解并重视这些超越常规制造的构想，并给予了得力的技术支持，这次展览才得以实现。可以说，与这些公司和个人的合作为这次展览打下了坚实的基础。

能够激活创作欲望的是人造纤维的开发过程，而非最终产品

本次展览陈列的展品展示了上述合作过程的结果。每一件展品都是一种纯粹、简洁的途径，借助这些途径，材料的各种特性将会表现为直观的实物形态。由于有可能掌控先前未知或未曾探索的知识领域，激发了创作者们的创作欲望。

经常有人问我们，而且问题惊人一致：这些展品是否将会转变成产品？老实说，在设计之初，我们就没有想过将这些展品转化成商业产品。本次展览原本就不是定位于实际产品开发上的。恰恰相反，对于本次展览而言更为重要的是，摒弃将展品转换为产品的念头，并集中精力关注纤维的各种可能潜力。当某件产品是为了销售并产生利润而设计的时候，它必须克服许多障碍，其中便包括核算成本、考虑制造加工方式，以及迎合特定市场或目标受众的品位。这就是产品制造业所要考虑的一切。这一点至关重要，它也解释了为何这些展品一点也不像产品。即使部分展品看似具有迎合当前市场偏好的潜质，但没有进一步的研发，仍旧很难将之投入大规模生产。这只是良好的期许。每一件展品的完成都非易事。

实际上，这些展品都不过是展示未来环境发展最初阶段的掠影，它们与时装或建筑，产品或交互设计的定义并不相符。不过，这也正是它们为何能够作为人造纤维的开发过程，并成功激活了创作者们创造欲望的原因所在。我确信，本次展览最终会触发大量实际产品的诞生。这次展览是一次良机，让我们深深呼吸，尽可能地从展品中获得启发吧！



Meaning of SENSEWARE

Kenya HARA Exhibition Director

Finding applications

Today, many new materials are being produced. The new materials may be attractive, but the problem we face is to discover how they can best be used. Japan has both the technology and the delicate sensibility needed to be a leader in the development of artificial fibers, and the result is the emergence of innovative advanced fibers one after another. Consequently, there is great interest in how the new fibers can be used, and keen anticipation at the application level, as people look forward to seeing what benefits the new fibers will bring. Without ideas for applications, advanced materials just stagnate, with their potential left unrealized. The aim of this exhibition is to deliberately bring a broad sweep of creators and technology people into contact with attractive new artificial fibers, encouraging them to think of applications that make the benefits of the material visible. Through that approach, Tokyo Fiber '09 attempts to show ideas for the future of manufacturing, exhibiting new environmental membranes derived from artificial fibers in order to share them with the world at large.

Examples of these innovative fibers and textiles are ultra-fine nanofibers that are only 1/7500 the thickness of a human hair, a carbon fiber that is tough, strong, and elastic, but surprisingly light, electro-conductive fibers that can conduct electricity like metal, moldable fibers that can be formed into 3D shapes, and triaxial woven fabric with three yarns intersecting at 60 degrees instead of a conventional warp and weft. There are many intelligent fibers that are as fine as animal tissue or cells. The question to address is what sort of applications we can find for them.

SENSEWARE

What is senseware? I define it as matter that stirs the human creative instinct and awakens the desire to make things. One good example is the role that stone played in the Stone Age. When you hold a stone axe in your hand, feel its hefty weight, and notice how hard it is, you sense that it arouses something deep inside you. When humans learned to walk on two legs, the hands that had newly gained their freedom

must have found stones to be a very special medium, providing just the right weight and workability, and bestowing the power to smash things. Coming into contact with stone stimulated the human desire to engineer and transform the world around us, and was the trigger for Stone Age culture. Hold a stone tool and you can instinctively understand that process.

Paper is another marvelous medium. Despite earth-colored natural origins, paper is white and has a certain stiffness. However, that whiteness and stiffness are easily destroyed. Given these incredibly delicate sheets of paper, people used black ink to add letters and drawings, irreversibly imprinting black marks onto the delicate whiteness. The startling contrast has been a driver of human creative desire ever since.

Natural fibers such as cotton, linen, and silk have also greatly excited creativity. Their softness, warmth, and the dazzling array of variations and colors that they can be dyed stirred desires towards clothing that went far beyond the need to protect the body and retain warmth. Alongside the rise of popular culture since the beginning of modern times, clothing has resonated with the way that people live, establishing fashion as a whole distinctive domain.

Artificial fibers are a new senseware

When artificial fibers first became available, they substituted for natural fibers in clothing. Nylon could be used to produce a fabric that was smooth and elegantly glossy like silk, and which also had the benefits of being tougher and amenable to volume manufacturing. Later came polyester and acryl, which had properties such as durability and resistance to wear, were easy to work and efficient to produce. Both soon became indispensable for clothing. Globalization has since led to fierce cost competition between producers of these fibers. Japan once supplied large amounts of artificial fiber to markets around the world, but later that role moved to Korea and Taiwan. Now, Korea and Taiwan have also given up, leaving the role to be taken up by China and India. The great majority of artificial fibers used in cloth-

ing today are now produced in countries with low labor costs.

Paralleling this shift, Japan's artificial fibers became much more advanced and high-tech, enabling them to transcend the area of clothing and find a broader range of applications. By shifting from clothing to eco-materials in general, many more applications become feasible. Examples include man-made blood vessels, airplane fuselages, membranes for filtering water, swimwear, sports footwear, and other advanced clothing. The industry has extended its footprint into peripheral areas such as intelligent materials where appearance and tactile experience are less of a priority than structure and function. Artificial fibers now provide greater performance than natural fibers in areas such as delicacy, sensitivity, formability, rigidity/toughness, and flexible expression. Artificial fibers are currently hinting at dramatic developments that will make them into a completely new senseware, acting like skin cells to form our environmental interface.

Creative talents make the potential visible

This exhibition has been organized by seven of Japan's fiber manufacturers. Each of these firms provided an orientation to explain its advanced fibers. After carefully considering the characteristics of the materials on offer, I narrowed down the candidates to a selection for use in the exhibition, selecting the collaborating creators at the same time. Matchmaking of fibers and creators is the make-or-break decision for this exhibition. Eventually, I invited 15 creators and 2 companies to participate, comprising people working in architecture, interior design, product design, art direction, and media analysis, together with an automaker, a high-tech domestic appliance manufacturer, a flower artist, and fashion designers. There is no contradiction in choosing companies to be creators for this project. If anything, high-tech companies are an embodiment of creativity through the convergence of high-tech and sensitivity. The products exhibited here are the result of this intersection between the potential of fibers and the creativity of the participating designers.

In bringing these works to reality, we relied on collaboration with a num-

ber of small companies, each of which is a master of some form of technology. Technologies tapped included press forming of nonwoven fabric and triaxial woven fabric using molds, ink-jet techniques for dyeing microfibers, forming techniques for carbon fiber, animatronics to make a car laugh, laser cutting technology, the technology for embedding optical fiber in concrete and cutting the result, robot manufacture and advanced sensor technology, precision metal machining, and the technology to make backrests rise out of a sofa. The exhibits you see would not have been possible without technological interventions by small companies with the ability to comprehend and appreciate ideas that transcend ordinary manufacturing. Collaborating with these small companies and individuals provided the base that supports the creation you see exhibited.

Not products, but mechanisms to provide stimulus

The exhibits displayed represent the result of this process. Every one of them is a pure and simple approach to visualizing the properties of a material. Desire is stimulated by hints of an opportunity to grasp something that was previously unknown or unexplored.

We are asked with surprising regularity whether the exhibits will ever become products. To be honest, these exhibits were not conceived with the idea of being turned into commercial products. The role of this exhibition is to not to think of actual products. On the contrary, it is important to eliminate that goal and concentrate on the fiber's potential. When a product is designed to be sold and generate profits, it must clear a number of hurdles, including conditions concerning cost, manufacturing methods, and meeting the tastes of specific markets or target customers. That's what product manufacture is all about. This is a very important point, and it provides the reason why these exhibits are not at all like products. Even if some of the exhibits have been made to look as though they have qualities that meet current market preferences, they would still be difficult to manufacture in vol-

ume without further work. That's only to be expected. Each of the exhibits involves making something that is very difficult to make.

In fact, these exhibits are purely the shoots that represent the first growth of a future environment. They do not fit definitions of fashion or architecture, product or communication. That is why they are successful as mechanisms for providing a massive stimulus. Although the exhibits are not products, I am convinced that this exhibition will eventually trigger a large number of actual products. It is an opportunity to take a deep breath and smell the possibilities.