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トランスフォーマブル・デザインから
アダプティブ・デザインへ

チャック・ホバーマン インタビュー

数学的美学の探求から
実用的価値の追求へ

－形而、トイデザイン、建築など多彩な活動をされて
いますが、ご自分の職業を一番大切に思っていれば、それは
何でしょうか？

学歴から言えば、一般教養を学んだ後で、彫刻
や機械工学の学位を取得しましたが、アートと
数学にも常に興味を持っていた。もちろん、
そのときには、直接職業に結びつくとは思わ
なかったのですが、何か特別なオブジェクトをつ
くりたいという感じを続けていて、それらの知識が
そうしたオブジェクトのための綿密なインスピ
レーションになると考えたのです。

トイデザインを手がけたのは、この分野には
何かモチーフがあると考え、自分の想っ
たものを何でもつくることができるからです。ア
ートワークを世に送り出すうえでも、素晴らしい
分野だと思います。発明という行為自体に、
ある種の芸術的な要素がありますから、相性も
良いですね。

どういうわけか、確かに仕事の領域は多岐に
渡っていますが、さまざまな意味を含めて、私は
自分のデザイナーだと思っています。

－現代のパニックマン・フラーと呼ばれること
もありますが、それについてはどのように感じてい
ますか？

フラーは、自然の中にある宇宙の法則を発見
しようとするスピリットを持っていた素晴らしい
人物で、確かにいろいろな影響を受けた人の
なかのひとりだと言えるでしょう。しかし、実際
の私は、構造的な手法を得意とする建築家など
からの影響もありますし、誰かひとりにそうな
えることはできないと思います。

ただ、フラーのように自らの名を冠したシグ
ネチャーワークにも興味があり、実際にそうし
た作品も多くついてきました。例えば、「ホバーマ
ン・フィア」は自分にとって大きなサインで
チャーチワークの１つです。そして、このようなオ
モチャに関するもの、構造的には独自の厳格
な方法論に基づいています。

From Transformable Design to Adaptive Design

An interview with Chuck Hoberman

Photo by Shinichi Isao

チャック・ホバーマン／1956年アメリカマサチューセッツ州
ケンブリッジ生まれ。ブラントン大学でリバプールアーツを学
び、ニューヨークのクーガー・ユニオンで現代の彫刻家、および
カリフラ大学で機械工学の修士号を取得。50年に
ホバーマン・フィアーツ、95年にホバーマン・デザイン
を設立し、現在に至る。

Chuck Hoberman was born in Cambridge, Massachu-
setts, USA, in 1956. He studied sculpture and art at
Brown University, received a Bachelor's degree in sculpture
at New York's Cooper Union, and his Master's in en-
gineering from Columbia University. He estab-
lished Hoberman Associates in 1985 and Hoberman De-
signs in 1995.

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しかし、今は、自分の名前が前に出ないとしても、プロジェクトの一員となることで、より大きな問題解決に当たることのほうが重要だと感じています。

― 創造的な作品やトイのジャンルから近年では建築物、建物の形が大きく変わっているように見えますが、それも関係していますか？

自分にとっては、何かを行ううえで、What（何を）やHow（どのように）だけでなく、Why（なぜ）という部分も重要なのです。最初はアート的あるいは数学的な興味からスタートしたものので、ここ数年の気候変動の問題に直面したとき、自分たちの専門知識を生かせるのではないかと感じました。これは誰もが関わるべき問題であり、そこに実用的価値を見出すようになったのです。

ダイナミックな環境と人間との間に、スタティックな建物が存在する状態は不自然であることを認識するホバーマン。

ダイナミックな環境と人間との間に、スタティックな建物が存在する状態は不自然であることを認識するホバーマン。適応性の高い建物を実現するのは困難かもしれないが、それが求めるものであることを理解しています。

ダイナミックな環境に適合する
アダプティブな建築

― ご自身のデザインのキーワードとして「トランスフォーマビルビリティ（可変性）」がありますが、その点にこだわるのです。

トランスフォーマビルビリティはキャパシティ・トゥー・チェンジ、つまり「変化を受け入れられることができる》キャパシティ」を意味しています。デザインの世界では珍しい概念かもしれませんが、自然界にあまねく存在するものです。特に生命体の場合には、一生涯の間に体型が変わったり、もっとマクロ的に見れば進化の過程なども変形の1つでしょう。

われわれの社会を見ても、すべてのレベル、さまざまなスケールにおいて変化があり、それに対応するために変形が求められているのです。建築分野で言えば、建物は普通、固定的なものと

Although non-powered ventilation systems are possible if they employ heat convection, there are very few buildings that incorporate such advanced structures.

軽く回転を与えて設置すると表現が変形する「スケール・ピッチ」や、周り基点の相対位置が維持された状態で変形する構造を想定してつくられている。
From Transformable Design to Adaptive Design

Traditional design is focused on creating static structures that are meant to remain unchanged throughout their lifetime. However, in the realm of architecture, there is a growing interest in transformable design, which allows for structures to adapt to their environment or changing conditions. This approach not only enhances the functionality of the built environment but also promotes sustainability by reducing the need for frequent renovations or reconstructions.

In the context of adaptive design, MoMA's Emerging Surface project exemplifies the concept. The installation features a series of diamond-shaped panels that can be rotated, creating a dynamic and interactive space. This not only allows for a variety of configurations but also demonstrates the potential of such designs in urban environments. The use of such technologies can lead to more efficient and less wasteful use of space and resources.

In conclusion, the transition from traditional to transformable and adaptive design is a significant shift in architectural thinking. It challenges the conventional approach to design and construction, advocating for more flexible, responsive, and sustainable built environments.
The Heubermann Arch, which was developed as an attraction for the 2002 Winter Olympics, is an example of transformative design in which openings can open and close while maintaining the overall semicircular form.

The ceiling of Campus de la Justicia, which was created in collaboration with Norman Foster in Madrid, employs adaptive shading that can create any lighting condition you want.
From Transformable Design to Adaptive Design

Cooperation with Rumiko Ito

Architecture has a great influence on the sustainability of society. Both the materials and the operation are important. For example, why should blinds and shades be made the same way they were hundreds of years ago? They are parts that affect energy savings related to air conditioning and heating. My team and I asked ourselves what sort of skin and facade a building should have and developed a next-generation facade. Buildings that incorporate this create their own optimum internal environment by adjusting to changes in the exterior environment. Because it uses a small motor to undergo transformation, it doesn't need to consume much energy. I call design that adapts to the environment "adaptive design," and it has a close relationship to transformable design. Adaptive design is what you get if you add practical value to transformable design, like the art and mathematical objects I mentioned above.

In the case of architecture-related projects, what sort of process, in a concrete sense, do you use to realize adaptive design?

First an architectural office, which is my client, takes the initiative and brings a rough idea to my team. The Adaptive Shading System, realized thanks to a next-generation facade, was born of a collaboration with the architectural office of Brit- ain's Norman Foster. The architectural team asked for the shade to be concealed inside the structure, so we adopted a tree metaphor and proposed an adaptive shading design that allowed light to hit only where necessary and create a vivid space.

Architecture comes with various restrictions: How do you overcome them?

Our initiative is still at the very beginning and we must grasp the limits of what can be done. However, I think that having a vision is important. Our team has only 8 members, but we are collaborating with the structural and environmental engineers of the internationally proven Büro Happold, and have formed an organization called the Adaptive Building Initiative in order to expand our network of projects.

In any case, adaptive design is too large a theme for any one person. Although I believe I can serve as a catalyst, I should be able to spark a completely new way of thinking about things, including architecture.

How did you come to be involved in many different fields, such as sculpture, toy design, and architecture?

After getting a general education I learned degrees in sculpture and mechanical engineering, but I've always been interested in art and mathematics. Of course, at the time I didn't think it would lead directly to an occupation, but I always wanted to create something special and, to that end, I thought those areas of knowledge would give me the pure inspiration to create it. The reason I went into toy design was because the field didn't have a definition of what toys had to be, and I could design anything I wanted to. It's also a great field to expose your art works to the world. The act of invention has an element of play, so there's an affinity there with toy design. For that reason, I see myself as a designer in various senses of the term.

It seems that in recent years structures and architecture have taken on a relatively more important role than them as a whole, in various ways.

For me, when I'm engaged in something it's important to ask not only What? and How? but also Why? I originally began from an interest in art and geometry, but as we are facing the problem of climate change in the last few years, I've been thinking we could make use of our expertise. This is everybody's problem, and I've begun to see practical value in my knowledge.

One of your key concepts is transformability. Why are you particular about that?

Transformability means the capacity to change. Although it may be a rare concept in the design world, it's common throughout nature. An organism's body changes over its lifetime, and from the macro point of view the process of evolution is also a kind of transformation.

There are also transformations on all levels and various scales of our society, and other transformations are required in order to deal with them. In the field of architecture, buildings are typically considered to be fixed in place. But is it really a good idea for the building to be static when the people who live inside it and the outside environment are all dynamic? Introducing transformable design makes sense here.

The first major structure in which you employed the concept of transformability was Hoberman Arch for the 2002 Winter Olympics in Salt Lake City, right?

It was a theatrical attraction rather than a practical structure, but I think it was a good opportunity for me. Later, in a more meaningful context, I was able to think about the significance of transformable buildings.