在衆多「可能率」背後有一個粒子在東奔西跑以符合滿足呢？相對論告訴我們，一物之存在，與其活動實是一事並非二事，它們只是四度時空世界的不同方面而已。

東方神秘主義者，顯然從冥想直覺中也體驗到了類似的「眞實」，你看他們的傳說、神話或寓言，多是以時間與變化爲特徵。你越深入研究，就越發現他們的世界觀充滿著「無恆常」、「變化」等的描寫。而且，他們直覺到的物質之時空本性，正是相對論的典型特徵。但近代物理學家必須在研究次原子世界時，才不得不考慮四度時空，因此而獲到對物質的新看法。東方神秘主義者，却是從自身之體驗，就能了解到物質的動態本性，不需要依賴工具和假設推理。這是多大的差別！總之，神秘主義者的日常生活所見，與一個近代物理學者研求微小粒子世界之所見相同。（其見相似，其用不同——譯者）如鈴木大拙在一本書中說：

「佛教徒看一物，是把它當作一件事相，而不是看成一件實物。」

最近的物理研究，漸漸走向結合相對論與量子論的道路，希望由二者的結合，能替次原子世界尋得一個完滿的理論。到目前爲止，雖然我們做不到全部，却陸續建立了許多能部分解決問題的理論和模型。「靴帶」模型就是其中之一。因爲它在所有模型當中，最大膽也最富有希望，所以我們特別要介紹它。你將會發現，它與某些佛學的哲學思想可說一脈相通。

（下期續完）

修學禪定者所體驗的高次元，當然不會與相對論裏所處理的高次元相一致。但是他們對於「時」「空」的見解，却非常相似。神秘主義者似乎强有力地直覺到「時空」的眞相，「時間空間相連不分」的事實，不斷地被强調著。相對論物理的特徵，正是「時空」的相連不分。佛教學者鈴木大佐曾經寫道：

「基於純粹之體驗，無獨立於空間之時間，亦無獨立於時間之空間。」

「時空」的觀念，與我們對大自然的看法密切相關。所以修正它們，就要修正整個觀察、描述自然的體系。其中最重要的修改，就是發現物質是能量的一種形式。即使靜止的物體，也存著絕大的能量。

這些新的研究結果，包括「時空」的統一性、「質能」的等價性，使科學家必須從根本上改變對「粒子」的看法。物質不再被認爲是基本單位的堆積，粒子也不被視爲一成不變的實體，而是能量之束。能量，不也意味著動態和變化嗎？我們將要討論到的基本粒子，本質上就是如此——動態而不可捉摸！

爲了更清楚認識，我們必須牢記此點；即，我們是從相對論的時空關係去觀察這些粒子的，而且，唯有如此才可觀察。既然我們考慮到四度時空中的粒子，粒子就不只是撞球或像砂粒一樣的物體而已。它還有特性，那就是因能量而表現出來的波動性。由於波動性，使它的存在成爲活動不拘的，它活動的範圍可以包括整個宇宙，正如波動的無限延展性。我們可以知道它在何處有多大的可能率存在，如果到那個地方去找，也可找到具備這麼一個存在的可能率的粒子。但，這是否就代表：

「外在世界與內省的世界，對佛教徒而言，只是像同一塊布的兩面罷了。在這塊布之中，所有的力量和事件，所有的意識型態和所有的意識對象，都被織成了一塊不可分的網，其中有著相互影響的無盡關係。」

Ⅲ 時間與空間

第二個近代物理中最基本的理論，無疑的就是相對論了，它使我們對時間與空間的看法，爲之耳目一新。空間不只是長寬高的意義而已，時間也非單獨存在之量。時間與空間，彼此緊緊地連在一起，我們稱之爲：四度時空連續體。簡而言之，於相對論中，談起時間必牽涉到空間；同理，空間也一定牽涉到時間。

它對科學家來說並不陌生，因爲相對論應用到物理上已經很久了。但是儘管我們非常熟悉相對論的數學形式，也懂得怎樣去運算；是不是就證明我們已經「懂」得了相對論呢？並不盡然。因爲在人類的經驗裏找不到「四度」這一回事，所以「四度的時空連續區」這件事——作爲相對論的基本架構，直覺上變得難以接受，是不可言說的。這樣算是完全懂得了相對論嗎？

同一個問題，也存在於東方神秘主義者的經驗之中。一個修行者，似乎可以超越日常經驗的三度空間，達到更高、多次元的實際體驗。而正如相對論的四度時空一樣，這項體驗，難以日常語言表達。高紋達喇嘛談到：

「更高次元世界的經驗，是由多重禪定狀態累積而來。所以此種冥想的體驗，幾乎不可能在三次元世界裏說明。」

一地某一時找到某物的可能率。

於是，至少在原子的領域，古典物理中堅實物質的概念溶化成了概率波的型態。但是，又有新的問題產生——物理世界中的物質怎麼可能只是一些概率呢？是的，檢討原子物理裏實際觀察的過程，我們發現一個次原子粒子在單獨存在時根本沒有意義（對我們而言），只有在測量、實驗之時，由於儀器接收到某種反應形像，我們藉著反應形像說我們看到了它，如此它與我們才建立了某種關係。可是，我們並不曾眞正看到那個單獨存在的它。只要一經反應接觸，我們就得到一些形像，這些形像並非是它，而只是它與我們的「關係」。所謂的概率波，終極言之，應是「交互關係的概率波」。它的存在，存在於「物」與「物」間的關係，同樣的，測量的物和被測量的物，也是其他「物」之間交互作用的關係。再論下去，這其他「物」難道有實體嗎？能够找到一個有實體的物嗎？

量子論如此推衍結果，我們感覺到一整體不可分的意像。如果一切都是彼此交互關係的顯現，那麼一切就是交互關係的本身而已，我們找不到可以獨存、自成的個體。你看，自然沒有顯示我們任何基本的積木塊，反而使我們看到一幅由錯雜的關係所組成的網，這些關係屬於一個不可分的整體的各個部分。用威廉•海森堡（測不準原理發明者）的話來說：

「這世界就像是一塊由各種事件，所錯綜複雜交織出來的布；事件形成了各式各樣的線，有的互相交錯，有的結合了起來，他們共同決定了這塊布料的性質。」

你看，它與東方神秘主義者的世界觀，多麼相像！科學家在微觀世界的經驗，正與神秘主義者內省的詣悟不謀而合。以西藏佛教喇嘛高紋達的話，可資對照：

Ⅱ. 廣大無邊的宇宙網

本世紀初年，物理學家做了許多原子方面的實驗，由於實驗結果完全出乎意料之外，大大驚動了整個科學界。原來物理學者一直在尋找物質的最基本單位——原子，以爲它一定是堅硬而不可分的固體粒子，可是實驗的發現完全不一樣。原子不但不是堅硬的，而且可以再細分——至少有電子，在核外廣濶的區域裏繞動。不但如此，而從一九二〇年代量子力學——次原子世界的理論基礎——完成之後，我們清楚地知道甚至是電子、中子和質子（三者就是所謂的「次原子」的代表性粒子），也遠非過去所想像的堅硬粒子。次原子的物質單位也是很抽象的，有時呈「粒子」狀，有時是「波」，看你如何去觀察它而定。但它既是粒子，又是波，這種雙元性是極端令人迷惘的事情，因爲「波動」意謂著分佈於廣大空間，而「粒子」則意謂一個精確的位置。這兩者如何能同時成立呢？

顯然矛盾的，局面終於在完全出乎常理的方式之下獲得解決，但是解決的鑰匙，却打擊着古典的機械世界觀的基礎，尤其是「物質」的終極眞實性的觀念。這一句話也許十分費解，「物質」當然是眞眞實實的存在啊，還可懷疑嗎？是的，在次原子的研究當中，我們無法確定「物質」的確在這裏或那裏，我們只能估計出「物質」可能存在的「趨向」而已。這些「趨向」，用量子理論來說，可以用「概率」和其相應的數學式子以「波」的形式表現出來，波振幅的絕對值平方卽是物質存在的概率。所以，波和粒子的二重性並不矛盾，因觀察之廣狹、或作用對象而有不同的結果。不過，這個波並非三度空間裏的「波動」，而是「概率波」，它具有一切波的性質，能指示某

度的錯覺。當然，分別並辨認各樣相異的東西，可說是每天生活中有用且必須的經驗，我們總不能分不清東南西北地生活啊！東方神秘主義者的著眼點，是在改進人類認知方式的缺陷，要求在認知上捨棄一切「想像」和「固定化」的成分，隨時隨地面對「眞實」；須知道眞實世界是不可想像的、不固定的，更進一步說，要面對眞實就是要「不想像」，如虛空接納一切，而不摻雜一點點想像的成分。如果一個人逐漸學習到面對眞實之時，人的內在也漸漸得到統一、寧靜和喜悅的效果，他對事物的觀察，也比平常人更加敏捷及深遠。總之，日常方式的認知雖然似乎不可缺少，却不一定是符合於「眞實」。東方神秘主義者由對「眞實」的體驗之中，視此世界爲一個恒變或不固定之體。換句話說，他的世界觀是動態的，以時間和變化爲主要特徵。整個宇宙被看做一個不可分的整體，一個永遠在動作之中、活生生而有機的整體，包括精神與物質在內。讀者將於下篇中，發現並思索同樣的想法，看看它與近代物理的基本觀念關係如何？

這張照片中之陰陽兩極，互為消長。代表佛法（佛像）與近代物理科學（方程式）能夠互為啓發、消長之義。

I 「機械」與「有機」的世界觀

以機械爲象徵的世界形像，可以說是古典物理的傳統世界觀，它根源於希臘原子論者如狄莫克里脫、盧夕帕斯等人的哲學之中。原子論者認爲：物質像積木一樣地組成，是由無數個被動的、無生命的小單位（卽原子）所堆積起來。而推動原子的外在力量，被稱之爲精神，基本上與物質完全不同。上述的看法，成爲西方式思考的骨幹，處處把精神與物質、心靈與身體視爲不同的兩回事，卽所謂的心物二元論。此後，這種看法繼續發展，在西哲笛卡爾手裏，奠定爲尖銳而確定的二元論形式：世界由兩個截然不同且相獨立的領域所組成，一爲精神，一爲物質。這項二元論形式的哲學內涵，首先表現在科學工作者的態度上面；後者相信自己可以完全立足於研究的對象之外，因而可以完全客觀地把物質世界這一個大機器看得一清二楚。爾後，牛頓果然保持了宇宙爲那種大機器的看法，他用微積分和力學建構成宇宙的「機械」模型，成爲十七世紀後半至十九世紀末，一切物理思考的核心。這個爲牛頓所代表的物理學，常被人稱做「古典物理」。

相對於古典物理的機械式宇宙觀，就是東方神秘主義者所服膺的宇宙觀；它的特徵是「有機的」、「統合的」或「生態的」，它視宇宙的所有現象爲一不可分之整體的各部份。對東方神秘主義者而言，所有感官所能捕捉的事物都是彼此緊密交錯、生生不息的，而且都是同一究竟實相（絕對眞理）的不同部分之不同顯現。在這一種世界觀裏面，我們那種將所看到的世界分成若干個分開而獨立固定的個體，或本身感覺到有一個獨立不變的「我」存在的傾向，被視爲是人類意識中分別、計

變。如本世紀初葉對於原子和「次原子」(1)世界的研究，使我們看出古典物理中許多基本觀念的缺陷。以「物質」這個觀念來說，原子物理學家和世人的看法就大相逕庭。還有時間、空間以及因果等等，莫不如此。這些觀念，都是我們賴以評斷週遭世界的媒介，因此他們的改變也正意味著一個新世界觀的浮現，爲西方人前所未見。更令人驚異的是，這個新的世界觀，和兩千多年前東方神秘主義者的見解不謀而合。當我們研究印度教、佛教或道教的宗教哲學時，我們發現許多近代物理的基本觀念裸然呈現。

您看，從近代物理開始，我們至少有兩條完全不同的發展方向，一條是通往原子彈的，一條是通往釋迦牟尼佛的。下面我將比較古典的「機械」世界觀，和東方神秘主義者的「有機」世界觀，並指出爲什麼近代物理（以相對論和量子論爲中心的物理學）的兩種基本觀念和東方的精神傳統並無軒輊。最後，我將要檢討作爲近代物理之思想尖端的「靴帶理論」(2)，因爲它所涵攝的哲學理念，極可能是近代科學對「自然」的看法之最高點。我們且將看到它與大乘佛學顯著的相似之處，而大乘佛學同樣被認爲是佛陀教誨中最高最勝者。

註一：「次原子」是比原子更小的粒子的通稱，如電子、中子。

註二：靴帶理論是解釋次原子世界的一種模型。靴帶原指長統皮靴兩側或後面上部開口處的帶子，使用它即可達成「不用外助」，「自己穿脫」的目的；其引申處大約是指不應尋找基本粒子，沒有基本粒子存在，現有諸粒子互為基本、互相含攝，即構成自相圓融的現前宇宙。詳情除本文外，可參閱粒子物理一類的一般性書籍。

第一部分：機械的世界觀和有生命的世界觀之比較。

第二部分：宇宙網。討論物質的本性，「波」「粒子」之二重表現，以及宇宙的整體性。

第三部分：時空。

第四部分：靴帶理論——是物理學上對基本粒子的一種看法，與佛法接近。

第五部分：赫貞靴帶模型。赫貞指強力交互作用的粒子。這個模型，是實際應用靴帶模型的結果，表現了粒子相攝相入的性質。將之對照於華嚴宗的世界觀，實足發人深省。

作者是一位最負盛譽的大物理學家，由於他深入淺出的介紹，物理部分的理論變得甚為生動易解。讀者如能仔細閱覽研讀，那末，對現代物理與佛法都可得到很大的收穫，且有相互啓發之妙用。

周 宣 德

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近代物理的迅速發展，影響人類的生活至深且鉅。一個最爲人知的例子，就是美國投下長崎與廣島的原子彈；它們殺傷了成千上萬條生命，也從此使得大部分人類知道了「近代物理」的威力。

除了能造成原子彈恐怖破壞力之外，近代物理之突破性理論，更在精神、文化方面，引起觀念、哲學及世界觀的重大改

近代物理與佛學

富・卡普拉博士作
張　鴻　洋　譯

《摘譯自美國"New Realties"第一卷第一期》

前　言

現代科學日新月異，但是人類對世界究竟真相的了解是否也日新月異呢？近代物理學研究物質之本性、原子能及時空等，它可以代表今日的科學成果。從本文裏，我們發現到近代物理學的基本觀念，在二千多年前就被佛法所預示。如果這不僅僅是巧合，它的意義實在很重大。這表示古代聖者們對世界的了解，遠超過現代人所能想像；同時也表示科學正與古老的智慧逐漸接近，現代人類在了解世界真相上，甚至還趕不上古人，但是科學再進步，就可能會更接近的。

本文主要是一篇溝通近代物理學與佛學思想的傑出作品。文內都是先以近代物理的觀念為線索，然後逐一提出佛法思想來對比的。

time" character of material objects which is so typical of relativistic physics. Physicists have to take into account the unification of space and time when they study the subatomic world, and consequently they view the objects of this world—the particles—in terms of activity and processes. The Eastern mystics, in their nonordinary states of consciousness, seem to be aware of the unity of space and time at a macroscopic level and thus they see the macroscopic objects in a way which is very similar to the physicists' conception of subatomic particles. Suzuki, for example, writes in one of his books on Buddhism.

"Buddhists have conceived an object as an event and not as a thing or substance."

Current research in physics aims at unifying quantum theory and relativity theory into a complete theory of the subatomic world. We have not yet been able to formulate such a complete theory, but we do have several partial theories, or "models," which describe certain aspects of subatomic phenomena very well. I shall now concentrate on one of these models, called the "bootstrap" model, which is perhaps the most ambitious of them all and shows the most striking parallels to certain ideas in Buddhist philosophy.

(To be continued)

are fused into a four-dimensional continuum. In such a framework, the particles can no longer be pictured as static three-dimensional objects, like billiard balls or grains of sand, but must be conceived as four-dimensional entities in space-time. Their forms have to be understood dynamically, as forms in space and time. Subatomic particles are dynamic patterns which have a space aspect and a time aspect. Their space aspect makes them appear as objects with a certain mass, their time aspect as processes involving the equivalent energy. Relativity theory thus gives the constituents of matter an intrinsically dynamic aspect. It shows that the existence of matter and its activity cannot be separated. They are but different aspects of the four-dimensional space-time reality:

The Eastern mystics have developed ways of experiencing the "space-time" character of reality intuitively. Thus most of their concepts, images and myths contain time and change as essential elements. The more one studies the religious and philosophical texts of the Hindus, Buddhists and Taoists, the more it becomes apparent that in all of them the world is conceived in terms of movement, flow, and change. More than that, the Eastern mystics also have a strong intuition for the "space-

writes:

"As a fact of pure experience, there is no space without time, no time without space."

In physics, the concepts of space and time are so basic for the description of natural phenomena that their modification entails a modification of the whole framework we use to describe nature. The most important consequence of this modification is the realization that mass is nothing but a form of energy. Even an object at rest has energy stored in its mass.

These developments—the unification of space and time and the equivalence of mass and energy—have had a profound influence on our picture of matter and have forced us to modify our concept of a particle in an essential way. In modern physics, mass is no longer associated with a material substance, and hence particles are not seen as consisting of any basic "stuff," but as bundles of energy. Energy, however, is associated with activity, with processes, and this implies that the nature of subatomic particles is intrinsically dynamic.

To understand this better, we must remember that these particles can only be pictured within the framework of relativity theory where space and time

and ordinary language.

A similar situation seems to exist in Eastern mysticism. The mystics seem to be able to attain non-ordinary states of consciousness in which they transcend the three-dimensional world of everyday life to experience a higher, multidimensional reality, a reality which, like that of relativity theory, is impossible to describe in ordinary language. Lama Govinda talks about this experience when he writes:

"An experience of higher dimensionality is achieved by integration of experiences of different centres and levels of consciousness. Hence the indescribability of certain experiences of meditation on the plane of three-dimensional consciousness."

The dimensions of these states of consciousness may not be the same as the ones we are dealing with in relativity theory, but it is striking that they have led the mystics towards notions of space and time which are very similar to those implied by relativity theory. Throughout Eastern mysticism, there seems to be a strong intuition for the "space-time" character of reality. The fact that space and time are inseparably linked, which is so characteristic of "relativistic" physics, is stressed again and again. The Buddhist scholar D. T. Suzuki, for example,

example, the following quotation from a Tibetan Buddhist, Lama Govinda:

"The external world and his inner world are for (the Buddhit) only two sides of the same fabric, in which the threads of all forces and of all events, of all forms of consciousness and of their objects, are woven into an inseparable net of endless, mutually conditioned relations."

Space-time

The second basic theory of modern physics,—the theory of relativity—has brought about a drastic change in our concepts of space and time. It showed us that space is not three-dimensional and that time is not a separate entity. Both are intimately connected and form a four-dimensional continuum called "space-time." In relativity theory, therefore, we can never talk about space without talking about time, and vice versa.

Science has been living with relativity theory for a long time, and we have become thoroughly familiar with its mathematical formalism. But this has not helped our intuition very much. We have no direct sensory experience of the four-dimensional space-time, and therefore we find it very hard to deal with such a reality at the level of intuition

of things, but rather probabilities of interconnetions. A careful analysis of the process of observation in atomic physics shows that the subatomic particles have no meaning as isolated entities, but can only be understood as interconnections between the preparation of an experiment and the subsequent measurement. Subatomic particles are not "things" but are interconnections between "things," and these are interconnections between other "things," and so on.

Quantum theory thus reveals a basic oneness of the universe. It shows that we cannot decompose the world into independently existing smallest units. As we penetrate into matter, nature does not show us any isolated basic building blocks, but rather appears as a complicated web of relations between the various parts of a unified whole. In the words of Wemer Heisenberg:

"The world thus appears as a complicated tissue of events, in which connections of different kinds alternate or overlap or combine and thereby determine the texture of the whole."

This, however, is the way in which the Eastern mystics experience the world, and they often express their experience in words which are almost identical to the words used by atomic physicists. Take, for

puzzling; the picture of a wave which is always spread out in space is fundamentally different from the particle picture which implies a sharp location.

The apparent contradiction between the two pictures was finally solved in a completely unexpected way—which struck a blow to the very foundation of the mechanistic world view, to the concept of the reality of matter. At the subatomic level, matter does not exist with certainty at definite places, but rather shows "tendencies to exist." These tendencies are expressed, in quantum theory, as probabilities and the corresponding mathematical quantities take the form of waves. This is why particles can be waves at the same time. They are not "real" three-dimensional waves like sound or water waves. They are "probability waves," abstract mathematical quantities with all the characteristic properties of waves which are related to the probabilities of finding the particles at particular points in space and at particular times.

At the atomic level, then, the solid material objects of classical physics dissolve into wave-like patterns of probabilities. But this again seems paradoxical. How can the physical world consist of mere probabilities? Well, it turns out that the patterns, ultimately, do not represent probabilities

environment, but it is not a fundamental feature of reality. For the Eastern mystic, any such objects have therefore a fluid and ever changing character. The Eastern world view is thus intrinsically dynamic and contains time and change as essential features. The cosmos is seen as one inseparable reality—forever in motion, alive, organic; spiritual and material at the same time. I shall now show how the main features of this picture appear in modern physics.

The Cosmic Web

At the beginning of our century, the experimental investigation of atoms gave sensational and totally unexpected results. Far from being the hard and solid particles they were believed to be since antiquity, the atoms turned out to consist of vast regions of empty space in which extremely small particles—the electrons—moved around the nucleus. When quantum theory, the theoretical foundation of atomic physics, was worked out in the 1920s, it became clear that even the subatomic particles, i.e., the electrons and the protons and neutrons in the nucleus, were nothing like the solid objects of classical physics. The subatomic units of matter are very abstract entities. Depending on how we look at them. they appear sometimes as particles, sometimes as waves. This dual aspect of matter was extremely

independent realms; that of mind and that of matter. The Cartesian division allowed scientists to treat matter as dead and completely separate from themselves, and to see the material world as a multitude of different objects assembled into a huge machine. Such a mechanistic world view was held by Newton who constructed his mechanics on its basis and made it the foundation of classical physics. From the second half of the seventeenth century to the end of the nineteenth, the mechanistic Newtonian model of the universe dominated all scientific thought.

Opposed to the mechanistic conception of the world is the view of Eastern mystics which may be characterized by words like "organic," "holistic," or ecological," as it regards all phenomena in the universe as integral parts of an inseparable, harmonious whole. For the Eastern mystic, all things and events perceived by the senses are interrelated, connected, and are but different aspects or manifestations of the same ultimate reality. Our tendency to divide the perceived world into individual and separate things and to experience ourselves as isolated egos in this world is seen as an illusion which comes from our mentality of measuring and categorizing. The division of nature into separate objects is, of course, useful and necessary to cope with our everyday

Finally, I shall discuss the philosophical ideas underlying the so-called "bootstrap" model which combines the basic concepts of both quantum and relativity theory into a conception of nature that may well be the culmination of modern scientific thought. It will be seen that this conception shows the most striking parallels to certain ideas in Mahayana Buddhism which, in turn, have been considered to be the culmination of Buddhist philosophy.

Mechanistic and Organic World Views

The traditional world view of classical physics is a mechanistic view of the world. It has its roots in the philosophy of the Greek atomists, Democritus, Leucippus and others, who saw matter as being made of several "basic building blocks," the atoms, which are purely passive and intrinsically dead. They were thought to be moved by some external force which was often assumed to be of spiritual origin, and thus fundamentally different from matter. This image became an essential part of the Western war of thinking. It gave rise to the dualism between spirit and matter, between the mind and the body, which is characteristic of Western thought. This dualism was formulated in its sharpest form in the philosophy of Descartes who based his view of nature on a fundamental division into two separate and

subatomic world in the twentieth century has revealed an unsuspected limitation of classical ideas and has required a radical revision of many of our basic concepts. The concept of matter in subatomic physics, for example, is totally different from the traditional material substance of classical physics, and the same is true for concepts like space, time, or cause and effect. These concepts, however, are fundamental to our outlook on the world around us and with their radical transformation our whole world view has begun to change. Out of these changes, a new world view is beginning to emerge; a view which is closely related to the views held in Eastern mysticism. The concepts of modern physics often show striking parallels to the ideas expressed in the religious philosophies of Hinduism, Buddhism and Taoism.

Modern physics, then, can lead us along two different ways: to the bomb or to the Buddha. Here I shall indicate a few of the steps leading to the Buddha. After a brief juxtaposition of the mechanistic world view of classical physics and the "organic" view of Eastern mysticism, I shall show how the two basic theories of modern physics, quantum theory and relativity theory, imply a view which is closely related to that of the Eastern spiritual traditions.

of particles. It is quite inspiring that this idea was illustrated in the world views of the Avatamsaka Sutra.

Dr. Fritjof Capra is a well-known physicist. Thanks to his vivid explanation, the theories of modern physics become lively and easy to understand. You will get profit from reading this article carefully. And, you will find that modern physics and Buddhism can interpret each other properly.

H. T. Chow

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It is no exaggeration to say that the effects of modern physics have been shattering. They have been shattering in a very literal sense, at the physical level, as we have become painfully aware ever since two bombs were dropped on Hiroshima and Nagasaki.

But modern physics has had shattering effects also at the intellectual, cultural and spiritual levels. There, it has shattered ideas, concepts, philosophies and world views. The exploration of the atomic and

has a really significant meaning. It shows that ancient sages understood this world more than what modern people may expect. It also shows that modern sciences are approaching the wisdom of ancient times and modern people's understanding of the universe is not necessary more than that of ancient people. But, as sciences advance, these two fields will get closer.

This article explains the relations of modern physics and Buddhist thoughts. The concepts of modern physics are presented at first and then paralleled with Buddhism.

The first part is the comparison of mechanistic and organic world views.

The second part deals with the cosmic web. It discusses the reality of matter, the dual appearance of "waves" and "particles," and the oneness of the universe.

The third part concerns time and space.

The fourth part treats the bootstrap idea of modern physics. Its suggestion of the fundamental constituents of matter is similar to that of Buddhism.

The fifth part describes the model of the hadron bootstrap--the strongly interacting particles. The model is the result of appplying the bootstrap idea. It shows the interpenetration ond interconnectedness

中英文摘
Bilingual Buddhist Digest

ANCIENT BUDDHISM IN MODERN PHYSICS

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TRANSLATED INTO CHINESE
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(Excerpted From "New Realties" Vol.1 No.1)

Prolog

Modern sciences are evolving everyday. But, does mankind's understanding of the ultimate truth of the universe increase everyday? Modern physics explores the reality of matter, the atomic energy, the space and time, etc. It represents the culmination of modern sciences. From this article we can find that the basic concepts of modern physics were already foreshadowed by Buddha more than two thousand years ago. If it is not merely a coincidence, this fact