Physics and psychology

Space, time and cause

Modern physics has developed greatly in the last few centuries, since the time of Newton and Galileo. But the development has come at the cost of a special restriction. Modern physics has developed by restricting its consideration to an external world, where objects co-exist in space.

This restriction has an obvious advantage. Different people see the same objects and the same structures that relate these objects together. So modern physics can be standardized objectively, for academic institutions and industrial corporations, on a national and global scale.

In particular, modern physical descriptions have been highly standardized to carry out objective calculations, which are tested and applied through standard instruments and machines. It's thus that modern physics has been so successful. Its success is achieved by investigating an external world of space and structure. Nature is considered here as a mechanical construction, which is made by relating different parts.

But how can we go on to investigate experiences of life and mind? The investigation then becomes reflective. It goes on from structure, to consider meaning that has been expressed. Thus, nature is considered further, as expressing meaning in our lives and minds. This leads to sciences that are quite different from modern physics, because they consider nature to include a component of mind.

In Sanskrit, nature is called 'prakṛti', which literally means 'acting forth'. This description most certainly includes activities of mind that express a living meaning, from underlying consciousness. Similarly, in ancient Greek, nature is called 'phusis', which implies a growth of life with an expression forth of meaningful activity.

Many ancient sciences consider nature in this way, to include our living faculties of body and of mind. In the old sciences, these faculties are carefully refined and put to use, as an essential part of testing and application. There is a contrast here with modern physics, which is applied specifically through instruments that are fabricated and constructed from material objects. The old sciences are more broadly tested and applied. They make a further use of living faculties, which are cultivated and refined through a reflective process of learning.

How then can living faculties be used in science? They work through different levels of experience, as consciousness becomes expressed, in the process of our lives. An old analysis is summarized in figure 1 (next page). It describes three levels, rising from an underlying ground.

- The uppermost level is our outside world of space and structure, seen through our bodies. Here, meaning is articulated, in symbols that are joined into elaborated structures.
- The second level is a succession of passing states, which each of us experiences in time. The world of objects is conceived through this succession in our minds.

Figure 1

Space	Different points that co-exist	World of objects	Elaborated structure, perceived by body
Time	Changing moments that pass by	Succession of states	Mediating process, conceived by mind
Causality	Consequence that carries on	Unmanifested potency	Silent seeing, at the depth of insight

Knowing in identity

Here, meaning is drawn out and interpreted, as our feelings and our thoughts keep on expressing consciousness and reflecting back to it. A changing stream of mind thus mediates between our inner knowing and the objects we perceive.

- At the third level, we experience continuity, of cause that carries on through time. Such cause must carry on unmanifest, as a quiet potency implying tacit aptitudes and capabilities that may be manifested later on. Here, continuity is carried by a silent seeing at the depth of insight, where changing states of surface mind are taken into lasting knowledge.
- Beneath the three levels is an underlying ground, from where our knowing is expressed. That ground is a consciousness whose very being is to know. It's only known in identity, by returning back to what it is.

This analysis has been described in many different places, perhaps most famously in the *Māṇḍūkya Upanishad* and in Bhartṛhari's *Vākyapadīya*.

In the *Māṇḍūkya Upanishad*, the three levels are described as manifested in three states – of waking, dream and deep sleep. And the ground is called 'caturtha' or 'turīya' or the 'fourth'. This description is designed for philosophical and spiritual enquiry.

In Bhartṛhari's *Vākyapadīya*, the three levels are called 'vaikharī' which means 'elaborated', 'madhyamā' which means 'mediating', and 'paśyantī' which means 'seeing'. And, in an extension of Bhartṛhari's description, the ground is called 'parā', which means 'beyond'.[1] The description is designed for linguistic analysis, as language is used to convey and to investigate what's known. So it is particularly relevant to scientific disciplines. In what follows, an attempt will be made to explain it further, level by level.

At the level of external space, language is expressed in articulated structures. The expression works through names or symbols, which are used to stand for particular things. As symbols are related together, in symbolic structures, they describe corresponding structures in the world.

[1] In figure 1, these terms are represented in the fourth column, at the extreme right.

This structural description works like a map. The symbols on a map correspond to places that they signify, in some represented territory. And the relations between symbols correspond to represented relations, between the places signified. Thus, through a mapping correspondence, we use our structured pictures to perceive and to describe a much larger world.

Modern physics works like this, through a correspondence of external structures. For example, when a cruise missile is guided towards its target, it uses an electronic map whose structure corresponds to the territory where the missile has to travel. On-board cameras detect expected landmarks in the territory and predicted reference points close to the target, so as to guide the missile with great speed and accuracy. The guidance is mechanical. It operates without the intervention of a living pilot's faculties. Structure is here used as an operating mechanism, independent of our living faculties.

But structure is not only used mechanically. It also has a living use, which works through education. A map can of course be used in a calculating way, to specify a useful route and its distance to a chosen destination. But this is not essentially how maps are used. Maps also have a living use, which enables us to think more clearly about the places where we travel. Through that living use of maps, we can come to a better understanding of where we are and where we need to go.

Such a living usage can be investigated scientifically – as for example in the science of linguistics, which investigates our living use of speech. But the investigation cannot be confined to structure in the world. It must go on to a further consideration, of the process we experience in our minds.

Process in the mind

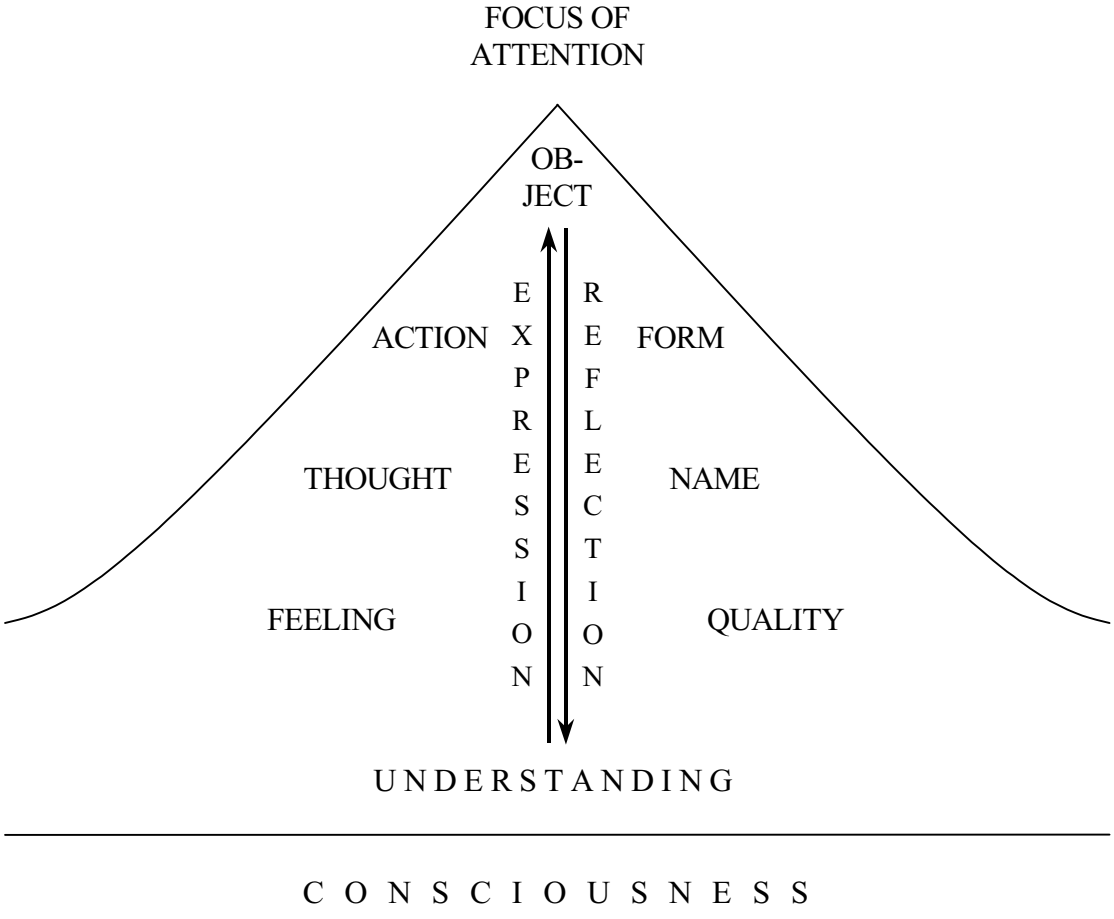
There is a crucial difference between the objects of the world and the passing states of mind. In the world, different objects co-exist and can therefore be combined into structures. But in the mind, changing states don't co-exist. Each state replaces previous states, and is in turn replaced. No two states appear together, side by side.

Accordingly, no structure can appear in mind, combining different states. Whenever structure is perceived, it appears in a world of objects that have been conceived by mind. Strictly speaking, structure never does appear in the actual process of replacing states that come and go in mind. At this level, only changing states occur, one at a time.

Each state of mind occurs in passing, with an object shown appearing in the world. The object is that part of world to which the mind's attention has been turned, at the present moment of time. This object is particular. It appears at a narrow tip of mind's attention, while the rest of the world is understood more broadly underneath. That understanding is expressed from underlying consciousness, at the background of experience.

An illustration is shown in figure 2 (next page). If you look at the up and down arrows in the middle, you will see that they describe a cycle of expression and reflection, which is found implied in every passing state of mind. The expression rises up through feelings, thoughts and actions which have drawn attention to the object that appears. Then, as the object is perceived and interpreted, there follows a reflection back, through its form, its name and its quality. The object is thus taken in and understood. Its perception is assimilated into a continued understanding – which carries on in consciousness, beneath the changing states of mind.

Figure 2



As the cycle repeats, understanding is again expressed, in further perceptions that get taken in and assimilated. The changing states of mind are thus associated with a repeated cycle of learning, which keeps on reflecting back and forth between the objects mind conceives and a background consciousness beneath the changing mind. It's through this cycle that we learn from experience. Without it, there could be no process of learning.

But, as the mind thus mediates between the world and consciousness, it functions through a living energy that does not act from any object. It acts instead from consciousness, beneath all changing process and all differentiated structure.

In the world of space and structure, energy is seen to act from one object to another. Here, we observe a transacted energy, which is carried and exchanged by objects. This energy is carried as a static or dynamic potential, in objects and objective structures. From there, it is released to act. In course of time, it is seen travelling through space, in moving patterns of observed activity. This is the energy that is described in modern physics.

But, in the process of our minds, their changing states are motivated by an energy that is inspired from consciousness. That is the energy which we experience in our living faculties of feeling, thought and action. It is what motivates our feelings, thoughts and actions to express a continued knowing in the objects we conceive. In Sanskrit, that living energy is described as 'prāṇa', thus associating it with breath and

speech. It's here implied to be a subtle energy of inspiration, through which speech expresses meaning and what's said is taken in.

That energy is not a transacted commodity. It does not work through any mere transaction between objects, nor between our changing states of mind. It only works by returning back to consciousness, from which later states of mind and their objects are expressed. In the process of our minds, earlier and later states are not directly connected. Their only connection is through consciousness, from which each state arises and to which each state returns.

Levels of enquiry

How then can cause and effect be investigated in the mind? How can we investigate the potency of living capability that consciousness assimilates, beneath the changing states of mind? Such an investigation must turn deeply back into the very capability that asks the questions. The mental capabilities that do the questioning must come themselves into further question, as the enquiry proceeds. That reflective application is essential to the science of psychology. But it does raise a delicate question. How can the enquiry continue to be scientific, as it reflects from structured systems into the unstructured depth of consciousness?

One way of considering this question is to look at different levels of scientific enquiry. An analysis is shown in figure 3. It is an interpretation of the old five elements: 'earth', 'water', 'fire', 'air' and 'ether'. The old names are somewhat metaphorical. They do not show different elements that combine at a single level of the outside world, like the periodic elements of modern chemistry. Instead, they are a division of experience into different levels, which get more subtle as we penetrate more deeply into nature's phenomena.

Figure 3

Traditional element	*Level of appearance*	*Perceiving instrument*	*Examining disciplines*
'Earth'	Pieces of matter	External body	Modern physics
'Water'	Patterns of energy	Living organism	Biological sciences
'Fire'	Meaningful information	Conceiving intellect	Cultural sciences
'Air'	Conditioned character	Intuitive judgement	Psychological sciences
'Ether'	Continuing existence	Reflective reason	Philosophical enquiry

- At the level of *'earth'*, we perceive what appear to be pieces of matter in the world. Here, it is taken for granted that nature is perceived through our external bodies. Modern physics makes this assumption, and it is necessarily applied through instruments that are fabricated through our external bodies.

- However, on further investigation, it turns out that pieces of matter are a somewhat crude appearance. What seem to be material objects are more accurately described as fluid patterns of dynamic energy. We are thus led to a level where nature appears through a changing flow of manifested happening. This is the level metaphorically described by the old element *'water'*.

  This level is considered both in modern physics and in the old sciences. In either case, energy is analytically described – as forming complex patterns of vibration and radiation, in an underlying field conditioning of space and time.

  But, in modern physics, the description is purely structural and mathematical. It works entirely through structured calculations and external instruments, which cannot rightly conceive how consciousness may be expressed through a living energy.

  In the old sciences, nature is considered in a less restricted way. They do not confine their examination to perception through our external bodies. Our observations of nature are no longer considered to take place through external bodies and their objects, but instead through living organisms and their faculties of mind and sense. These organisms are not merely structured objects, but instead are meaningful patterns of a living activity. They function through the living energy of prāṇa, which inherently expresses meaning from an underlying consciousness.

  In the modern sciences that we currently call 'biological', the energy considered is the same as modern physics. The very idea of a living energy is usually treated as illegitimate. But it is essential to many of the old sciences – in particular to medicine, and to astrology and alchemy. In this sense, they are more radically 'biological' than modern 'biophysics' and modern 'biochemistry'.

- When patterns of activity are further considered, they are understood to have a meaning. When their meaning is taken into count, it turns out that they are not just moving patterns. They also function as meaningful information, which tells us more about the world. We are thus led to a third level, where nature is made manifest through illuminating representations. This level is described by the old element *'fire'*. As information is interpreted, its surface show must get burned up, in order to reveal a further meaning.

  Here, in the use of information, modern physics is confined to quantitative measurements and calculations of mechanical variables like distance, time, speed, mass, momentum and energy. But older sciences go on to a much broader and deeper use of information, as we describe and conceive the world. They are thus cultural sciences, through which we educate our conceiving intellects.

  These cultural sciences include linguistics, history, and diverse fields of literary and artistic studies. They do not work primarily through structured calculation, but more essentially through a living process of education. Their use of reason is to cultivate and clarify our minds.

- When information is further considered, it is found to be comparative. It shows a relative conditioning of character, in the world and in our minds. This is a fourth level, where nature manifests itself through qualities and values that are intuitively

judged. This level is described by the old element *'air'*. Its qualities and values have a pervading influence, upon the objects we perceive and upon our thoughts and feelings. So it is like a pervasive climate, which keeps on influencing what we see and think and feel more narrowly.

In modern physics, this pervasive conditioning is described by a mathematical 'field', where a quantified value is ascribed to each point of space and time. But in the older sciences, quality and value are more fully and directly investigated in the mind.

That older investigation is through meditative practice. It seeks to expand intuition and to purify character, by repeated exercises of withdrawal from the restless turning at the narrow focus of attention. Withdrawing back into the depth of mind, a meditator seeks to develop penetrating judgements and subtle intuitions that transcend the usual limitations of the mind in space and time.

Such meditative practice is the basis of traditional psychology. This science is concerned with the turning of the mind. In Sanskrit, each state of mind is called a 'vṛtti'. Literally, a 'vṛtti' is a 'turning'. The term is thus used to describe our mental states as cyclic transformations, each of which arises through an outward turning from a common background that stays present in them all.

It's through this outward turning that the mind experiences what happens in the world. As anything that happens is perceived and taken in, it leaves behind a conditioned tendency. In Sanskrit, such tendencies are called 'saṁskāras'. They are assimilated at the underlying background, where they continue quietly, like dormant seeds of unmanifested potency. From that background, they influence the turning of the mind, from one state of experience to another.

It's only there that causality and learning can continue.

- When changing character is further considered, it is found to depend on continuity. This leads to a fifth level, where nature manifests a continuing existence that carries on through change. This level is described by the old element called *'ether'*. It is a background continuity, which pervades through space and time. It thus connects all different objects and all changing states.

  In modern physics, this level is described as the 'space-time continuum', whose geometry connects all events in the world. But the old sciences consider more than geometry. They investigate a continuity that's shared in common by both world and mind. It is thus both objective and subjective. Objectively, it carries on as the background of external space and time. Subjectively, it continues through each individual's experience, as the knowing background which persists through differing appearances that come and go. It thus enables an understanding of common principles, in the differing phenomena that nature manifests.

  That understanding is investigated by reflective reasoning, in the sciences of philosophical enquiry.

Impersonal knowing?

In the end, all sciences are built on common ground, beneath the change and difference of appearances. That ground is the basis on which different scientists communicate. On it depend all scientific standards, of accurate testing and of meaningful reference.

In modern physics, that ground is considered only as an objective world, where all standards depend on objects and structures that are commonly identified. However, in the older sciences, a further consideration is investigated, by reflecting the investigation back towards a ground of knowing that is shared subjectively. Such a subjective ground is inherently impersonal. It is an impersonal reality which different people share, beneath their changing personalities.

But is there such a ground, which is at once an impersonal reality and a subjective consciousness? Can a subjective reflection reach back down, to an impersonal knowing that gets usefully expressed in effective feelings, thoughts and actions?

These questions are avoided by the mechanical testing and application of modern physics. But they are kept open and alive, in the working practice of older sciences that turn attention more directly to our lives and minds. And this presents us with something of a challenge, in our modern academic teaching and its instituted standards.

As sciences investigate more deeply, into inner levels of experience, their teaching and their practice must become more individual. Accordingly, as sciences become more inward, they become less suited to external institutions, like modern universities and schools. This applies in particular to disciplines of meditation and spiritual enquiry. Here, books and scholars and institutes are inherently peripheral. The teaching centres on an individual relationship, between teacher and disciple.

What's taught arises from an inner depth of accomplishment, attained by the teacher. It is from there that techniques are used and ideas are interpreted, to guide and inspire a corresponding accomplishment in the disciple. Such an accomplishment works deep within the personality. As it proceeds, it is meant to go further down, to a depth where it becomes more impersonal and more dispassionate, so that a truer knowledge may be found.

This is a kind of learning that goes far beyond any academic jurisdiction. It cannot be rightly taught or tested or applied by academics, in their institutional and scholarly capacity. But, on the other hand, academics do have a role to play, in maintaining and presenting information about the inner sciences.

Here, academics are in a somewhat tricky situation, as they report on inner disciplines that cannot actually be taught in an academic context. An admission is required that such disciplines are only being reported in a limited way, by describing their ideas and techniques from outside. An academic here is a very limited accountant, reporting superficially upon a scientific practice that is learned and carried out elsewhere.

Thus, in a fundamental sense, reflective disciplines of meditation and philosophy cannot be academic subjects. When academics describe these subjects, their descriptions can't be more than theoretical. The actual practice of meditating must be learned and applied through a reflective journey. So also philosophical enquiry. In either case, the journey must go back within. It must penetrate beneath its theories and descriptions, to an inner depth of individuality.

One major difficulty here is our current notion of the 'individual'. This notion has become debased, by confusing individuality and personality. The word 'individual' comes from the Latin 'individuālis', which means indivisible. This is its essential meaning. It refers to an inner unity, at the centre of divided personality. The old sciences are intended to reflect back there, in search of a knowing that is free from the bias and distortion of our physical and mental partialities.